APPENDICES

Appendix A: NOP and NOP Comment Letters

Appendix B: Site 4, Western Hills Golf Course Site Plans

Appendix C: General Plan Elements

Appendix D: Zoning Code Amendments

Appendix E: Objective Design Standards

Appendix F: Shoppes Specific Plan 04-01 Amendment No. 6

Appendix G: Proposed General Plan Goals, Policies, and Actions

Appendix H: Air Quality and Greenhouse Gas Emissions Report

Appendix I: Biological Report

Appendix J: Cultural Report

Appendix K: Geology Report

Appendix L: Paleontological Report

Appendix M: Noise Report

Appendix N: Traffic Report

Appendix O: VMT Memo

APPENDIX A: NOP AND NOP COMMENT LETTERS

NOTICE OF PREPARATION AND SCOPING MEETING
DRAFT SUBSEQUENT PROGRAM ENVIRONMENTAL IMPACT REPORT
CHINO HILLS GENERAL PLAN UPDATE AND ZONING MAP AMENDMENT PROJECT
SCH No. 2013051082

DATE: October 28, 2022

TO: Responsible Agencies, Trustee Agencies, and Interested Parties

PROJECT NAME: Chino Hills General Plan Update and Zoning Map Amendment Project

LEAD AGENCY: City of Chino Hills
Contact: Michael Hofflinger, Planning Manager
Community Development Department
14000 City Center Drive
Chino Hills, California 91709

PROJECT ADDRESS: City of Chino Hills citywide, and nine specific sites: The Shoppes II (APN 1022-021-30, and -31), Park Overflow (APN 1032-221-05), Los Serranos Golf Course (APN 1028-351-01), Western Hills Golf Course (APN 1031-011-40), Wang (High Density) (APN 1030-041-03, 04 & 1017-251-05), Shoppes (APN 1022-021-49), Commons (APN 1025-471-06, 07 & 1025-461-06), Canyon Estates (APN 1017-251-14), and Wang (Medium Density) (APN 1030-041-03).

PUBLIC COMMENT PERIOD: October 28-November 28, 2022

SCOPING MEETING: November 10, 2022, 6-8 p.m.; at the City of Chino Hills McCoy Equestrian Center, 14280 Peyton Drive, Chino Hills, CA 91709

SUBJECT: Notice of Preparation for Draft Subsequent Environmental Impact Report and Scoping Meeting for the Chino Hills General Plan Update and Zoning Map Amendment Project

The City of Chino Hills (City) is preparing a Subsequent Program Environmental Impact Report (SPEIR) for the proposed Chino Hills General Plan Update Project (Project). Pursuant to Section 15162 of the California Environmental Quality Act (CEQA) Guidelines, the SPEIR will update the information, analysis and findings contained in the City of Chino Hills Final Program EIR General Plan Update (February 24, 2015) (Previous PEIR), which evaluated the potential impacts associated with the City's 2015 General Plan Update. The 2015 PEIR can be accessed at the link below.

https://www.chinohills.org/DocumentCenter/View/11274/Final-Program-EIR---General-Plan-CC-Final-2-24-15-4-22-no-appendices?bidId=

In accordance with CEQA Section 15082, the City has prepared this Notice of Preparation for the SPEIR to provide the public, nearby residents and property owners, responsible agencies, and other interested parties with information regarding the Project and its potential environmental effects. The SPEIR will be prepared by outside consultants under the supervision of the City of Chino Hills Community Development Department.

PROJECT LOCATION: The Project is located in the City of Chino Hills (see Figure 1, Project Location Map). The Project would update General Plan land use and Zoning designations on nine sites (see Figure 2, Proposed General Plan Amendment and Rezone Sites) and update General Plan Elements which affect the entire City. Specific parcels or portions of parcels proposed for either a General Plan amendment, rezoning, or both include: The Shoppes II (APN 1022-021-30, and -31), Park Overflow (APN 1032-221-05), Los Serranos Golf Course (APN 1028-351-01), Western Hills Golf Course (APN 1031-011-40), Wang (High Density) (APN 1030-041-03, 04 & 1017-251-05), Shoppes (APN 1022-021-

49), Commons (APN 1025-471-06, 07 & 1025-461-06), Canyon Estates (APN 1017-251-14), and Wang (Medium Density) (APN 1030-041-03). See Figure 2 for the precise locations of each of the nine sites.

PROJECT DESCRIPTION: The Project in an update of the General Plan to accommodate land use changes promulgated by the Chino Hills 2021-2029 Housing Element, adopted August 16, 2022; to address other changes to the General Plan required by state law; and to incorporate contemporary General Plan information regarding existing conditions and applicable planning documents.

Provisions of the Housing Element require amendments to General Plan land use designations and Zoning maps on the designated Regional Housing Needs Assessment (RHNA) sites, which includes revisions to the Land Use Element and Land Use Map of the City of Chino Hills General Plan, incorporating the land use changes for the nine RHNA sites, shown in Figure 2 below. The Housing Element also necessitates rezoning of the designated RHNA sites; therefore, the Project includes changes to the Zoning Map and Chapter 16.02, General Provisions and Definitions, of the Chino Hills Municipal Code. Table 1, below, lists the existing and proposed General Plan Land Use Map and Zoning Map land use designations for the nine RHNA sites.

Table I-3
Proposed General Plan Amendment and Rezone Sites

Map ID	Name	Site Acreage	Current General Plan	Proposed General Plan	Current Zoning	Proposed Zoning	Realistic Site Density Capacity	Unit Count Based on Site Capacity Density
1	Shoppes II	8.0	High Density Residential	Very High Density Residential Housing Overlay	SP 04-01	SP 04-01/ Very High Density Residential Housing Overlay	93.0	744
2	Park Overflow	1.8	Public Park	Very High Density Residential Housing Overlay	SP 04-01	SP 04-01/ Very High Density Residential Housing Overlay [a]	27.8	50
3	Los Serranos Golf Course: PA IV PA V	12.6 8.6	Commercial Recreation	Very High Density Residential Housing Overlay	CR	Very High Density Residential Housing Overlay	25.0	315 217
4	Western Hills Golf Course	8.3	Commercial Recreation	Very High Density Residential Housing Overlay	CR	Very High Density Residential Housing Overlay	20.0	166
5	Wang	7.3	Rural Residential	Very High Density Residential Housing Overlay	RR	Very High Density Residential Housing Overlay	20.3	148

Table I-3
Proposed General Plan Amendment and Rezone Sites

Map ID	Name	Site Acreage	Current General Plan	Proposed General Plan	Current Zoning	Proposed Zoning	Realistic Site Density Capacity	Unit Count Based on Site Capacity Density
6	The Shoppes	5.7	Commercial	Mixed Use Housing Overlay	SP 04-01	SP 04-01 / Mixed Use Housing Overlay	46.8	267
7	The Commons	9.0	Commercial	Mixed Use Housing Overlay	SP -06-01	SP -06-01/ Mixed Use Housing Overlay	33.3	300
	Subtotal Lower Income Sites Requiring Rezoning							**2,207**
8	Canyon Estates	13.3	Agriculture/Ranches	Medium Density Residential Housing Overlay	PD 19-161	Medium Density Residential Housing Overlay	12.0	160
9	Wang	30.5	Rural Residential	Medium Density Residential Housing Overlay	RR	Very High Density Residential Housing Overlay	9.0	275
	Subtotal Moderate Income Sites Requiring Rezoning							**435**
	Total Units Requiring Rezoning							**2,642**

Notes:

RR = Rural Residential; up to 2 du/ac
CR = Commercial Recreation
SP-04-01 = The Shoppes at Chino Hills Specific Plan
SP-06-01 = The Commons at Chino Hills Specific Plan
RR = Rural Residential
CR = Commercial Recreation
PD 19-161 = Canyon Estates Planned Development

Source:
City of Chino Hills 2021-2029 Housing Element, Appendix B: Candidate Site Analysis Planning Period 2021-2029, Table B-2 Lower Income Housing Sites by Site No., Name, Units and Acres – 6th Cycle RHNA, Units; Table B-3 Lower Income RHNA Allocation Site Detail; Table B-4 Moderate Income Housing Sites by Site No., Name, Units and Acres – 6th Cycle RHNA; City of Chino Hills General Plan Map and Zoning Map.

In addition to the Housing and Land Use Element updates, the City is required to make other changes to the General Plan in response to recent State legislation. To comply with Senate Bill (SB) 379, Assembly Bill (AB) 2140, and SB 1241, the Project updates the Safety Element to include new goals and policies for wildland and urban fire hazards, flood hazards, and climate change adaptation and resiliency strategies. In 2022, the City recently adopted Transportation Study Guidelines for Vehicle Miles Traveled. These Guidelines would be incorporated into the General Plan Circulation Element as part of the Project. In 2020, the City Parks and Recreation Commission approved a new Parks and Recreation Master Plan that would be incorporated into the Parks, Recreation and Open Space Element.

The Project also includes updates to the remaining General Plan Chapters: Conservation; Noise and Economic Development. Updates of these chapters address changed conditions and updated City plans and policies.

To ensure consistency, the Project also includes a Zoning Map amendment to incorporate the changes promulgated by the proposed General Plan Land Use Map, and, by reference, the Parks and Recreation Master Plan as its recommendations are incorporated in the Parks, Recreation and Open Space Element.

REQUESTED APPROVALS: The list below includes the anticipated requests for approval of the Project.

- Certification of the SEIR;
- Adoption of General Plan and Land Use Map Update (22GPA02)
- Amendment of Zoning Map (22ZC02)
- Adoption of changes to the Definitions sections of Chino Hills Municipal Code Amendment Chapter 16.02 (22MCA03)
- Specific Plan 04-01 6th Amendment to change the land use designations for Sites 1, 2 and 6, listed in Table 1, above
- Specific Plan 06-01 1st Amendment to change the land use designations for Site 7, listed in Table 1, above
- Approval of the Parks and Recreation Master Plan.

SUBSEQUENT EIRS AND NEGATIVE DECLARATIONS: Pursuant to CEQA Section 15162, an SPEIR is being prepared for the Project because the City has determined that the General Plan Update will require substantial changes to the Previous EIR. The SPEIR will follow the format of the Previous EIR, excluding topics related to Agriculture and Minerals for which the City was previously found to have no resources of statewide or regional importance. The SPEIR follows the contemporary CEQA checklist, adding topics related to Energy, Wildfire and Tribal Cultural Resources, which were not included in the Previous PEIR.

POTENTIAL ENVIRONMENTAL EFFECTS OF THE PROJECT: The proposed Project could have potentially significant environmental impacts in the following topic areas, which will to be addressed in the EIR: Aesthetics, Air Quality, Biological Resources, Cultural Resources, Energy, Geology and Soils, Greenhouse Gas Emissions, Hazards and Hazardous Materials, Hydrology and Water Quality, Land Use and Planning, Noise, Population and Housing, Public Services, Transportation, Tribal Cultural Resources, Utilities and Service Systems, and Wildfire.

PUBLIC SCOPING MEETING: Public Scoping Meeting will be held in an open house format at the McCoy Barn to share information regarding the Project and the environmental review process and to receive oral and written comments regarding the scope and content of the environmental analysis to be addressed in the SEIR. City staff, and environmental consultants will be available. The City encourages all interested individuals and organizations to attend this meeting. The date, time, and location of the public scoping meeting are:

Date: **November 10, 2022**

Time: **6:00 pm to 8:00 pm**

Location: **City of Chino Hills McCoy Equestrian Center, 14280 Peyton Drive, Chino Hills, CA 91709**

FILE REVIEW AND SUBMITTING COMMENTS: The enclosed materials reflect the scope of the Project. Project information is available for public review at the City of Chino Hills, Community Development Department public

counter, 14000 City Center Drive, Chino Hills, California 91709, during office hours Monday – Thursday, 7: :30 A.M. – 5:00 P.M., and Friday, 7:30 A.M. - 4:00 P.M. A copy of this notice may be viewed at the public counter or online at **https://www.chinohills.org/124/General-Plan** by clicking on the "General Plan Update SPEIR" tab, then "Notice of Preparation & Public Scoping Meeting".

The City will consider all written comments regarding the potential environmental impacts of the Project and issues to be addressed in the EIR. **Written comments must be submitted to this office by November 28, 2022.**

Please direct your comments to:

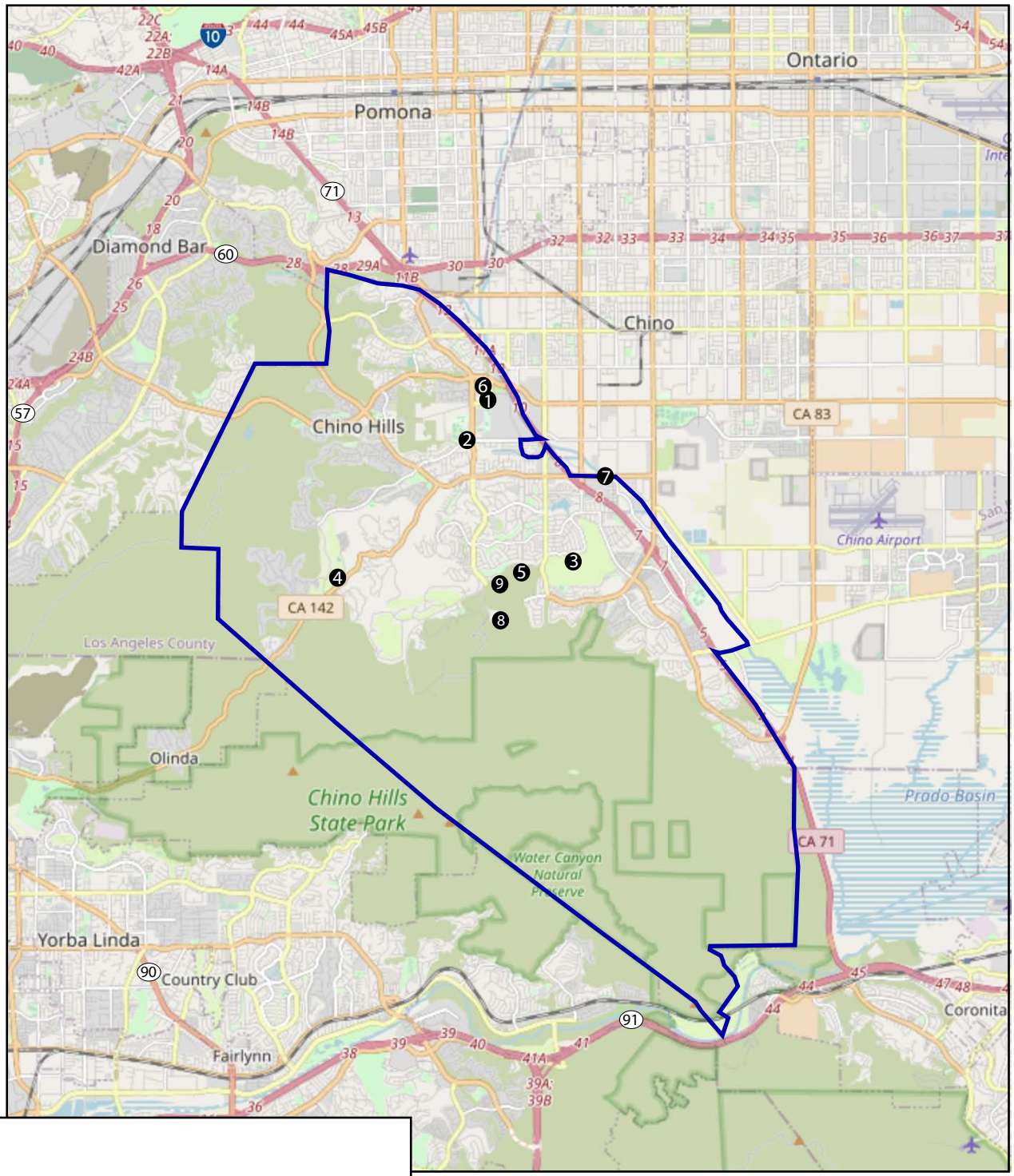
Mail:	Michael Hofflinger, Planning Manager City of Chino Hills Community Development Department 14000 City Center Drive Chino Hills, California 91709
E-mail:	mhofflinger@chinohills.org
Phone:	909-364-2777

Sincerely,
Community Development Department

Michael Hofflinger, Planning Manager

Attachments:
Figure 1 – Project Location Map
Figure 2 - Proposed General Plan Amendment and Rezone Sites

FIGURE 1
PROJECT LOCATION MAP



LEGEND

City of Chino Hills Boundary

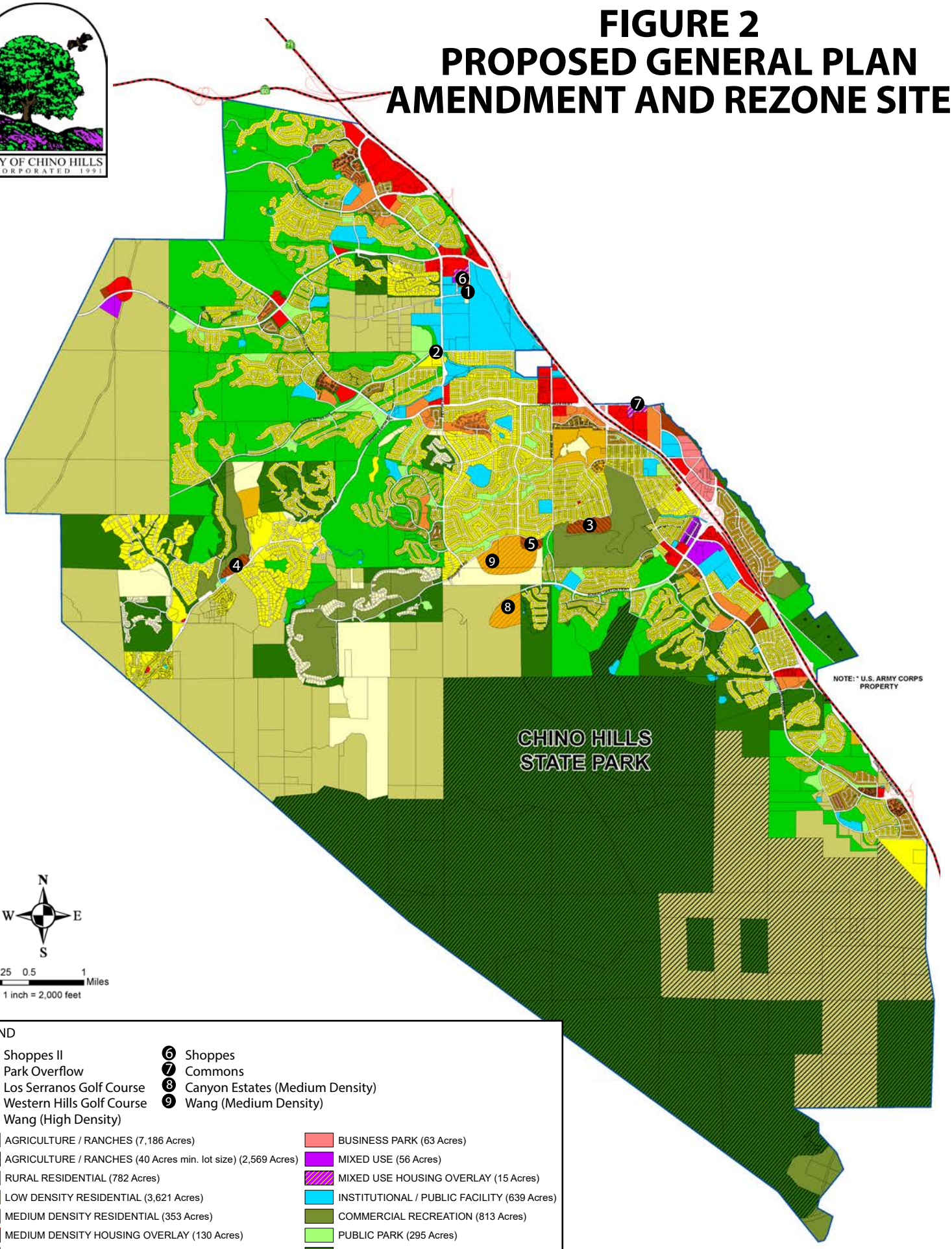
General Plan Amendment/Rezone Sites

1. Shoppes II
2. Park Overflow
3. Los Serranos Golf Course
4. Western Hills Golf Course
5. Wang (High Density)
6. Shoppes
7. Commons
8. Canyon Estates (Medium Density)
9. Wang (Medium Density)

Source: OpenStreetMaps, 2022.

N
W E
S

FIGURE 2
PROPOSED GENERAL PLAN AMENDMENT AND REZONE SITES



LEGEND

1. Shoppes II
2. Park Overflow
3. Los Serranos Golf Course
4. Western Hills Golf Course
5. Wang (High Density)
6. Shoppes
7. Commons
8. Canyon Estates (Medium Density)
9. Wang (Medium Density)

- AGRICULTURE / RANCHES (7,186 Acres)
- AGRICULTURE / RANCHES (40 Acres min. lot size) (2,569 Acres)
- RURAL RESIDENTIAL (782 Acres)
- LOW DENSITY RESIDENTIAL (3,621 Acres)
- MEDIUM DENSITY RESIDENTIAL (353 Acres)
- MEDIUM DENSITY HOUSING OVERLAY (130 Acres)
- HIGH DENSITY RESIDENTIAL (310 Acres)
- VERY HIGH DENSITY RESIDENTIAL (34 Acres)
- VERY HIGH DENSITY HOUSING OVERLAY (69 Acres)
- COMMERCIAL (419 Acres)
- BUSINESS PARK (63 Acres)
- MIXED USE (56 Acres)
- MIXED USE HOUSING OVERLAY (15 Acres)
- INSTITUTIONAL / PUBLIC FACILITY (639 Acres)
- COMMERCIAL RECREATION (813 Acres)
- PUBLIC PARK (295 Acres)
- PRIVATE OPEN SPACE (1,459 Acres)
- PUBLIC OPEN SPACE (3,186 Acres)
- CHINO HILLS STATE PARK (7,325 Acres)

South Coast
Air Quality Management District
21865 Copley Drive, Diamond Bar, CA 91765-4178
(909) 396-2000 • www.aqmd.gov

SENT VIA E-MAIL:
mhofflinger@chinohills.org
Michael Hofflinger, Planning Manager
City of Chino Hills
Community Development Department
14000 City Center Drive
Chino Hills, California 91709

November 23, 2022

Notice of Preparation of a Draft Subsequent Program Environmental Impact Report for the Chino Hills General Plan Update and Zoning Map Amendment Project

South Coast Air Quality Management District (South Coast AQMD) staff appreciates the opportunity to comment on the above-mentioned document. Our comments are recommendations on the analysis of potential air quality impacts from the Proposed Project that should be included in the Draft Subsequent Program Environmental Impact Report (SPEIR). Please send a copy of the Draft SPEIR upon its completion and public release directly to South Coast AQMD as copies of the Draft SPEIR submitted to the State Clearinghouse are not forwarded. **In addition, please send all appendices and technical documents related to the air quality, health risk, and greenhouse gas analyses and electronic versions of all emission calculation spreadsheets, and air quality modeling and health risk assessment input and output files (not PDF files). Any delays in providing all supporting documentation for our review will require additional review time beyond the end of the comment period.**

CEQA Air Quality Analysis

Staff recommends that the Lead Agency use South Coast AQMD's CEQA Air Quality Handbook and website[1] as guidance when preparing the air quality and greenhouse gas analyses. It is also recommended that the Lead Agency use the CalEEMod[2] land use emissions software, which can estimate pollutant emissions from typical land use development and is the only software model maintained by the California Air Pollution Control Officers Association.

South Coast AQMD has developed both regional and localized significance thresholds. South Coast AQMD staff recommends that the Lead Agency quantify criteria pollutant emissions and compare the emissions to South Coast AQMD's CEQA regional pollutant emissions significance thresholds[3] and localized significance thresholds (LSTs)[4] to determine the Proposed Project's air quality impacts. The localized analysis can be conducted by either using the LST screening tables or performing dispersion modeling.

The Lead Agency should identify any potential adverse air quality impacts that could occur from all phases of the Proposed Project and all air pollutant sources related to the Proposed Project. Air quality

[1] South Coast AQMD's CEQA Handbook and other resources for preparing air quality analyses can be found at: http://www.aqmd.gov/home/rules-compliance/ceqa/air-quality-analysis-handbook.
[2] CalEEMod is available free of charge at: www.caleemod.com.
[3] South Coast AQMD's CEQA regional pollutant emissions significance thresholds can be found at: http://www.aqmd.gov/docs/default-source/ceqa/handbook/scaqmd-air-quality-significance-thresholds.pdf.
[4] South Coast AQMD's guidance for performing a localized air quality analysis can be found at: http://www.aqmd.gov/home/regulations/ceqa/air-quality-analysis-handbook/localized-significance-thresholds.

impacts from both construction (including demolition, if any) and operations should be calculated. Construction-related air quality impacts typically include, but are not limited to, emissions from the use of heavy-duty equipment from grading, earth-loading/unloading, paving, architectural coatings, off-road mobile sources (e.g., heavy-duty construction equipment) and on-road mobile sources (e.g., construction worker vehicle trips, material transport trips, and hauling trips). Operation-related air quality impacts may include, but are not limited to, emissions from stationary sources (e.g., boilers and air pollution control devices), area sources (e.g., solvents and coatings), and vehicular trips (e.g., on- and off-road tailpipe emissions and entrained dust). Air quality impacts from indirect sources, such as sources that generate or attract vehicular trips, should be included in the analysis. Furthermore, emissions from the overlapping construction and operational activities should be combined and compared to South Coast AQMD's regional air quality CEQA ***operational*** thresholds to determine the level of significance.

If the Proposed Project generates diesel emissions from long-term construction or attracts diesel-fueled vehicular trips, especially heavy-duty diesel-fueled vehicles, it is recommended that the Lead Agency perform a mobile source health risk assessment[5].

Sensitive receptors are people that have an increased sensitivity to air pollution or environmental contaminants and include schools, daycare centers, nursing homes, elderly care facilities, hospitals, and residential dwelling units. If the Proposed Project will include residential units which are located in close proximity to freeways or other sources of air pollution like railroad tracks, and to facilitate the purpose of the Draft SPEIR as an informational document, it is recommended that the Lead Agency perform a mobile source health risk assessment[5] to disclose the potential health risks[6].

In the event that implementation of the Proposed Project requires a permit from South Coast AQMD, South Coast AQMD should be identified as a Responsible Agency for the Proposed Project in the Draft SPEIR. The assumptions in the air quality analysis in the Draft SPEIR will be the basis for evaluating the permit under CEQA and imposing permit conditions and limits. Questions on permits should be directed to South Coast AQMD's Engineering and Permitting staff at (909) 396-3385.

The South Coast AQMD's *Guidance Document for Addressing Air Quality Issues in General Plans and Local Planning*[7] includes suggested policies that local governments can use in their General Plans or through local planning to prevent or reduce potential air pollution impacts and protect public health. It is recommended that the Lead Agency review this Guidance Document as a tool when making local planning and land use decisions.

South Coast AQMD staff is concerned about potential public health impacts of siting potential warehouses within close proximity of sensitive land uses, especially in communities that are already heavily affected by the existing warehouse and truck activities. The South Coast AQMD's Multiple Air Toxics Exposure Study (MATES V), completed in August 2021, concluded that the largest contributor to cancer risk from air pollution is diesel particulate matter (DPM) emissions[8]. According to the MATES V Carcinogenic Risk interactive Map, the area surrounding the Proposed Project has an estimated cancer risk over 397 in one million[9]. Operation of warehouses generates and attracts heavy-duty diesel-fueled trucks that emit DPM. When the health impacts from the Proposed Project are added to those existing

[5] South Coast AQMD's guidance for performing a mobile source health risk assessment can be found at: http://www.aqmd.gov/home/regulations/ceqa/air-quality-analysis-handbook/mobile-source-toxics-analysis.
[6] *Ibid.*
[7] South Coast AQMD. 2005. *Guidance Document for Addressing Air Quality Issues in General Plans and Local Planning*. Available at: http://www.aqmd.gov/docs/default-source/planning/air-quality-guidance/complete-guidance-document.pdf.
[8] South Coast AQMD. August 2021. *Multiple Air Toxics Exposure Study in the South Coast Air Basin V*. Available at: http://www.aqmd.gov/home/air-quality/air-quality-studies/health-studies/mates-v.
[9] South Coast AQMD. MATES V Data Visualization Tool. Accessed at: MATES Data Visualization (arcgis.com).

impacts, residents living in the communities surrounding the Proposed Project will possibly face an even greater exposure to air pollution and bear a disproportionate burden of increasing health risks.

Mitigation Measures

In the event that the Proposed Project results in significant adverse air quality impacts, CEQA requires that all feasible mitigation measures that go beyond what is required by law be utilized to minimize these impacts. Any impacts resulting from mitigation measures must also be analyzed. Several resources to assist the Lead Agency with identifying potential mitigation measures for the Proposed Project include South Coast AQMD's CEQA Air Quality Handbook,[10] South Coast AQMD's Mitigation Monitoring and Reporting Plan for the 2022 Air Quality Management Plan,[11] and Southern California Association of Government's Mitigation Monitoring and Reporting Plan for the 2020-2045 Regional Transportation Plan/Sustainable Communities Strategy.[12].

Mitigation measures for operational air quality impacts from mobile sources that the Lead Agency should consider in the Draft SPEIR may include the following:

- Require zero-emissions (ZE) or near-zero emission (NZE) on-road haul trucks such as heavy-duty trucks with natural gas engines that meet the CARB's adopted optional NOx emissions standard at 0.02 grams per brake horsepower-hour (g/bhp-hr), if and when feasible. Given the state's clean truck rules and regulations aiming to accelerate the utilization and market penetration of ZE and NZE trucks such as the Advanced Clean Trucks Rule[13] and the Heavy-Duty Low NOx Omnibus Regulation[14], ZE and NZE trucks will become increasingly more available to use. The Lead Agency should require a phase-in schedule to incentive the use of these cleaner operating trucks to reduce any significant adverse air quality impacts. South Coast AQMD staff is available to discuss the availability of current and upcoming truck technologies and incentive programs with the Lead Agency. At a minimum, require the use of 2010 model year[15] that meet CARB's 2010 engine emissions standards at 0.01 g/bhp-hr of particulate matter (PM) and 0.20 g/bhp-hr of NOx emissions or newer, cleaner trucks. Include environmental analyses to evaluate and identify sufficient electricity and supportive infrastructures in the Energy and Utilities and Service Systems Sections in the CEQA document, where appropriate. Include the requirement in applicable bid documents, purchase orders, and contracts. Operators shall maintain records of all trucks associated with project construction to document that each truck used meets these emission standards, and make the records available for inspection. The Lead Agency should conduct regular inspections to the maximum extent feasible to ensure compliance.

[10] https://www.aqmd.gov/home/rules-compliance/ceqa/air-quality-analysis-handbook

[11] South Coast AQMD's 2022 Air Quality Management Plan can be found at: http://www.aqmd.gov/home/air-quality/clean-air-plans/air-quality-mgt-plan (Chapter 4 - Control Strategy and Implementation).

[12] Southern California Association of Governments' 2020-2045 RTP/SCS can be found at: https://www.connectsocal.org/Documents/PEIR/certified/Exhibit-A_ConnectSoCal_PEIR.pdf.

[13] CARB. June 25, 2020. *Advanced Clean Trucks Rule.* Accessed at: https://ww2.arb.ca.gov/our-work/programs/advanced-clean-trucks.

[14] CARB has recently passed a variety of new regulations that require new, cleaner heavy-duty truck technology to be sold and used in state. For example, on August 27, 2020, CARB approved the Heavy-Duty Low NOx Omnibus Regulation, which will require all trucks to meet the adopted emission standard of 0.05 g/hp-hr starting with engine model year 2024. Accessed at: https://ww2.arb.ca.gov/rulemaking/2020/hdomnibuslownox.

[15] CARB adopted the statewide Truck and Bus Regulation in 2010. The Regulation requires diesel trucks and buses that operate in California to be upgraded to reduce emissions. Newer heavier trucks and buses must meet particulate matter filter requirements beginning January 1, 2012. Lighter and older heavier trucks must be replaced starting January 1, 2015. By January 1, 2023, nearly all trucks and buses will need to have 2010 model year engines or equivalent. More information on the CARB's Truck and Bus Regulation is available at: https://www.arb.ca.gov/msprog/onrdiesel/onrdiesel.htm.

- Limit the daily number of trucks allowed at the Proposed Project to levels analyzed in the Final CEQA document. If higher daily truck volumes are anticipated to visit the site, the Lead Agency should commit to re-evaluating the Proposed Project through CEQA prior to allowing this higher activity level.
- Provide electric vehicle (EV) charging stations or at a minimum, provide the electrical infrastructure and electrical panels should be appropriately sized. Electrical hookups should be provided for truckers to plug in any onboard auxiliary equipment.

Mitigation measures for operational air quality impacts from other area sources that the Lead Agency should consider in the Draft SPEIR may include the following:

- Maximize use of solar energy by installing solar energy arrays.
- Use light colored paving and roofing materials.
- Utilize only Energy Star heating, cooling, and lighting devices, and appliances.
- Use of water-based or low VOC cleaning products that go beyond the requirements of South Coast AQMD Rule 1113.

Design considerations for the Proposed Project that the Lead Agency should consider to further reduce air quality and health risk impacts include the following:

- Clearly mark truck routes with trailblazer signs, so that trucks will not travel next to or near sensitive land uses (e.g., residences, schools, day care centers, etc.).
- Design the Proposed Project such that truck entrances and exits are not facing sensitive receptors and trucks will not travel past sensitive land uses to enter or leave the Proposed Project site.
- Design the Proposed Project such that any check-in point for trucks is inside the Proposed Project site to ensure that there are no trucks queuing outside.
- Design the Proposed Project to ensure that truck traffic inside the Proposed Project site is as far away as feasible from sensitive receptors.
- Restrict overnight truck parking in sensitive land uses by providing overnight truck parking inside the Proposed Project site.

On May 7, 2021, South Coast AQMD's Governing Board adopted Rule 2305 – Warehouse Indirect Source Rule – Warehouse Actions and Investments to Reduce Emissions (WAIRE) Program, and Rule 316 – Fees for Rule 2305. Rules 2305 and 316 are new rules that will reduce regional and local emissions of nitrogen oxides (NOx) and particulate matter (PM), including diesel PM. These emission reductions will reduce public health impacts for communities located near warehouses from mobile sources that are associated with warehouse activities. Also, the emission reductions will help the region attain federal and state ambient air quality standards. Rule 2305 applies to owners and operators of warehouses greater than or equal to 100,000 square feet. Under Rule 2305, operators are subject to an annual WAIRE Points Compliance Obligation that is calculated based on the annual number of truck trips to the warehouse. WAIRE Points can be earned by implementing actions in a prescribed menu in Rule 2305, implementing a site-specific custom plan, or paying a mitigation fee. Warehouse owners are only required to submit limited information reports, but they can opt in to earn Points on behalf of their tenants if they so choose because certain actions to reduce emissions may be better achieved at the warehouse development phase, for instance the installation of solar and charging infrastructure. Rule 316 is a companion fee rule for Rule 2305 to allow South Coast AQMD to recover costs associated with Rule 2305 compliance activities. If the Proposed Project has warehouse element, the Proposed Project's warehouse owners and operators will be required to comply with Rule 2305 once the warehouse is occupied. Therefore, South Coast AQMD staff recommends that the Lead Agency review South Coast AQMD Rule 2305 to determine the potential WAIRE Points Compliance Obligation for future operators and explore whether additional project requirements and CEQA mitigation measures can be identified and implemented at the Proposed Project

that may help future warehouse operators meet their compliance obligation[16]. South Coast AQMD staff is available to answer questions concerning Rule 2305 implementation and compliance by phone or email at (909) 396-3140 or waire-program@aqmd.gov. For implementation guidance documents and compliance and reporting tools, please visit South Coast AQMD's WAIRE Program webpage[17].

Many strategies are available to reduce exposures, including, but are not limited to, building filtration systems with MERV 13 or better, or in some cases, MERV 15 or better is recommended; building design, orientation, location; vegetation barriers or landscaping screening, etc. Enhanced filtration units are capable of reducing exposures. However, enhanced filtration systems have limitations. For example, in a study that South Coast AQMD conducted to investigate filters[18], a cost burden is expected to be within the range of $120 to $240 per year to replace each filter panel. The initial start-up cost could substantially increase if an HVAC system needs to be installed and if standalone filter units are required. Installation costs may vary and include costs for conducting site assessments and obtaining permits and approvals before filters can be installed. Other costs may include filter life monitoring, annual maintenance, and training for conducting maintenance and reporting. In addition, because the filters would not have any effectiveness unless the HVAC system is running, there may be increased energy consumption that the Lead Agency should evaluate in the Draft SPEIR. It is typically assumed that the filters operate 100 percent of the time while residents are indoors, and the environmental analysis does not generally account for the times when the residents have their windows or doors open or are in common space areas of the project. These filters have no ability to filter out any toxic gases. Furthermore, when used filters are replaced, replacement has the potential to result in emissions from the transportation of used filters at disposal sites and generate solid waste that the Lead Agency should evaluate in the Draft SPEIR. Therefore, the presumed effectiveness and feasibility of any filtration units should be carefully evaluated in more detail prior to assuming that they will sufficiently alleviate exposures to diesel particulate matter emissions.

South Coast AQMD staff is available to work with the Lead Agency to ensure that air quality, greenhouse gas, and health risk impacts from the Proposed Project are accurately evaluated and mitigated where feasible. If you have any questions regarding this letter, please contact me at swang1@aqmd.gov.

Sincerely,

Sam Wang

Sam Wang
Program Supervisor, CEQA IGR
Planning, Rule Development & Implementation

SW
SBC221108-07
Control Number

[16] South Coast AQMD Rule 2305 – Warehouse Indirect Source Rule – Warehouse Actions and Investments to Reduce Emissions (WAIRE) Program. Accessed at: http://www.aqmd.gov/docs/default-source/rule-book/reg-xxiii/r2305.pdf.

[17] South Coast AQMD WAIRE Program. Accessed at: http://www.aqmd.gov/waire.

[18] This study evaluated filters rated MERV 13 or better. Accessed at: http://www.aqmd.gov/docs/default-source/ceqa/handbook/aqmdpilotstudyfinalreport.pdf. Also see 2012 Peer Review Journal article by South Coast AQMD: https://onlinelibrary.wiley.com/doi/10.1111/ina.12013.

From:	Garrett Covington
To:	Michael Hofflinger
Cc:	Ryan Gackstetter; Brian Johsz
Subject:	Notice of Preparation and Scoping Meeting
Date:	Thursday, November 3, 2022 10:58:29 AM

Greetings Mr. Hofflinger,

My name is Garrett Covington and I have lived in Chino Hills since 1982.

I received in the mail Oct 31 "Notice of Preparation and Scoping Meeting" dated Oct 28.

I noticed the "Scoping meeting" was to be held 6-8pm on Nov 10th. the day before the Start of a 3 day Weekend. (Veterans Day) Plus, none of my neighbors received anything about this.

I talked to Ryan Gackstetter on Nov. 1st and we both came to the conclusion that there are questions that couldn't be answered at that moment.

Here are some of the questions I have.

1. Map "I.D.3 " Los Serranos Golf Course". I feel the the red highlighted area on the Figure 2 map is not a true representation of PA IV, 315 units,12.6 acres and PA V, 212 units 8.6 acres.
Is this a accurate representation? If not can we see a accurate representation?

2. How is Parking going to be addressed for these 532 units?, I'm under the impression the State/ County/ City is in the process of reducing the # of parking space assigned to each unit. Is this true?

3. Traffic, How is Traffic going to be addressed? Is there a proposed traffic plan by the City, Contractor? If so, can I look at it?

4. My Item #2 and #3, combined with the incomplete figure 2 map, (my item #1), plus all the traffic for Figure 2 map generated by # 8, #5, & #9. is going to be a traffic parking night mare. All the proposed areas dump onto 3 streets.
Do you have a solution?

5. I noticed in the Figure 2 map you didn't address all the new construction. I.E. Lake Los Serranos. Is this true? Are you going to include these areas in the Scoping meeting

6. Could the State requirements been spread out a little more evenly?

I noticed while talking to Ryan a "Planning for our Future Workshop" handout on Nov. 10th at the McCoy center. Same time Same Place. What is GIS mapping?

Unfortunately, I have a "Celebration of Life" for a fellow Veteran planned that weekend and can't make it to the Scoping meeting.

I'm a little disappointed at the date chosen and the short notice given for the meeting.

How can I get my questioned answered feel free to call or can I set up a appointment.to go over these items?

My Phone # is 909-973-2234

Thank You

Garrett C Covington

From: Ben Jimenez
To: Michael Hofflinger
Subject: Re: Genal Plan/Zoning Map [Sch. No. 2013051082] Public Comment
Date: Monday, November 28, 2022 4:53:44 PM

Hello Michael,

I noticed a misprint within the title of my prior email. For what it's worth, please replace "Genal" with "General".

Respectfully,

Ben Jimenez

Resident, Mountain View Neighborhood

On Mon, Nov 28, 2022 at 4:48 PM Ben Jimenez <jimenezgbenjamin@gmail.com> wrote:

> Good afternoon Michael,
>
> The purpose of this email is to comment on the proposed changes to Chino Hills General Plan/Zoning Map.
>
> The notice received summarizes the proposed amendments within the following table - Table 1, Proposed General Plan Amendment & Rezone Sites. I noticed that Map ID Number 9, Wang, 30.5 acre, is being proposed to be rezoned to a very high density residential overlay. The proposed change to the general plan doesn't correlate with the information that was previously provided in the preliminary planning commission meetings. It was indicated that two areas within the Wang property would be developed to contain very high density residential properties [Map ID No. 5], and medium density residential properties [Map ID No. 9]. Furthermore, the notice received indicates that the realistic site density for such area [Map ID No. 9] is 9.0 du/ac. The City of Chino Hills Final Program EIR - General Plan Update, Table 2-1 – General Plan Land Use Designation Descriptions, Development Standard, defines medium and very high density as the following-
>
> Medium Density Residential: 12 du/ac
>
> Very High Density Residential: 35 du/ac

Therefore, it is respectfully requested, that Map ID No. 9, Proposed Zoning, within Table 1 - Proposed General Plan Amendment & Rezone Sites, be corrected from "very high density residential housing overlay" to "medium density residential housing overlay", and that the changes be incorporated in all documents/exhibits respective to such matter.

Respectfully,

Ben Jimenez

Resident, Mountain View Neighborhood

From: Jim Moe
To: Michael Hofflinger
Subject: Park Overflow Zoning Map Amendment
Date: Monday, November 28, 2022 3:59:15 PM

Mr. Hofflinger,

We are opposed to the zone change for the parcel on Eucalyptus and Peyton Dr. from public park to very high density residential. Apartments don't fit the overall plan of the area of single family houses, public park and community center. I am sure the low amount of units can be added to a more suitable alternative in the General Plan Update.

We live directly across from this parcel on Peyton Dr. and it would negatively impact our home of 45 years. This list of concerns are: decreased privacy from a multiple story building, increased traffic to an intersection that is already extremely congested, discharge of water to our property, increased noise, possible exposure to hazard materials from prior owners/tenants (DDT was found in soiling testing for the community park), and a reduction in public parking.

Thank you,

Jim and Lois Moe
14551 Peyton Dr.

Jim

From:	Tori Richardson
To:	Michael Hofflinger
Subject:	General Plan
Date:	Saturday, November 5, 2022 3:42:54 PM

Hello,

My address is 15765 Country Club Dr, Chino Hills. I have tried to look at the PDF's and documents included in the General Plan sent to my property, and I just cannot make it out except on page 274 under https://www.chinohills.org/DocumentCenter/View/11273

Is there better map or can you explain what the impact this will have on our community in Los Serranos....Are you planning on taking the golf course out in back of our property.

I am asking since I may not be able to attend the meeting on November 10th.

Let me know if this is something you can help us with.

Sincerely,

Tori Richardson
(951)288-2006

APPENDIX B: SITE 4, WESTERN HILLS GOLF COURSE SITE PLANS



NORTH

GRAPHIC SCALE IN FEET
0 30 60 120

2021.08.05

Kimley»Horn

© 2010 KIMLEY-HORN AND ASSOCIATES, INC.
765 THE CITY DRIVE, SUITE 200, ORANGE, CA 92868
PHONE: 714-939-1030 FAX: 714-938-9488

APPENDIX C: GENERAL PLAN ELEMENTS

APPENDIX D: ZONING CODE AMENDMENTS

Chapter 16.02 GENERAL PROVISIONS AND DEFINITIONS

16.02.250 ”M” definitions and illustrations.

“Manufactured home” shall have the same meaning as that term is defined in California Health and Safety Code Section 18007.

“Manufacturing” means a facility that engages in the manufacturing of finished products or parts, predominantly from previously prepared materials, including processing, fabrication, assembly, treatment, and packaging of such products, and incidental processing of extracted or raw materials.

“Map Act” means the Subdivision Map Act of the State of California.

“Marijuana” shall have the same meaning as the term “cannabis” as defined in California Health and Safety Code Section 11018.

“Masonry” means construction composed of shaped or molded units, usually small enough to be handled by one (1) person and composed of stone, ceramic brick or tile, concrete, glass, adobe, or the like; sometimes used to designate cast-in-place concrete.

“Massage establishment” means and includes any massage establishment, parlor, or any room, place or institution where massage is given or administered by a massage practitioner or massage therapist for compensation.

“Massage practitioner” means a person who is currently certified as a massage practitioner by the CAMTC and who administers massage for compensation.

“Massage therapist” means a person who is currently certified as a massage therapist by the CAMTC, and who administers massage for compensation.

“Mechanical equipment” means any type of equipment, device or machine located on the exterior of a structure which operates a system or amenity on the property. Examples include but are not limited to heating, cooling, and venting (HVAC), plumbing, pool/spa pumps/filters, whole house fans and energy storage systems. This definition excludes generators and similar equipment.

“Medical clinic” means a health care institution specializing in treating patients with medical conditions that may require twenty-four (24) hour care on an ongoing basis but no longer require intensive care or extensive diagnostic procedures. Can also include a medical walk-in facility, urgent care and outpatient surgical center. These facilities may not include emergency ambulance services as standard business operations.

“Medical laboratory” means an establishment where clinical pathology and diagnostic tests are carried out on clinical specimens to obtain information about the health of a patient to aid in diagnosis, treatment and prevention of disease. These establishments do not include in-patient services.

“Medical laboratory (collection only)” means an establishment that is intended for in-patient services that provides medical or dental laboratory services that includes diagnostic imaging or testing services that are performed on site but require diagnostic evaluations typically at another location.

“Medical laboratory (testing and research)” means a facility where diagnostic testing and research is performed on bio-material, generally blood, body fluids, tissues and cells, to obtain information about the health of a being to aid in diagnosis, treatment, and prevention of disease. May also be referred to as pathology laboratory.

"Medical marijuana collective" means a collective, cooperative, association, dispensary or similar entity that cultivates, distributes, dispenses, stores, exchanges, processes, delivers, makes available or gives away marijuana in the City for medical purposes to qualified patients, or primary caregivers of qualified patients pursuant to Health and Safety Code Section 11362.5 (adopted as Proposition 215, the "Compassionate Use Act of 1996") or any state regulations adopted in furtherance thereof, including Health and Safety Code Section 11362.7 et seq., (adopted as the "Medical Marijuana Program Act"). Medical marijuana collective shall not include the following uses, so long as such uses comply with this Code, the California Health and Safety Code Section 11362.5, et seq., and other applicable law:

a. A clinic licensed pursuant to Chapter 1 of Division 2 of the Health and Safety Code.

b. A health care facility licensed pursuant to Chapter 2 of Division 2 of the Health and Safety Code.

c. A residential care facility for persons with chronic life-threatening illness licensed pursuant to Chapter 3.01 of Division 2 of the Health and Safety Code.

d. A residential care facility for the elderly licensed pursuant to Chapter 3.2 of Division 2 of the Health and Safety Code.

e. A hospice or a home health agency, licensed pursuant to Chapter 8 of Division 2 of the Health and Safety Code.

"Medical marijuana cultivation" shall mean the planting, growing, harvesting, drying, or processing of marijuana plants or any part thereof.

"Medical office" means office space used to provide diagnosis and outpatient treatment for medical, dental, optical, chiropractic, physical therapy, psychiatric care or similar therapeutic services.

"Micro-brewery, distillery, winery" means a business that produces less than fifteen thousand (15,000) barrels (typical industry standard barrel is thirty-one (31) gallons, and approximately seven thousand fifty-six (7,056) cubic inches) per year and may include food sales.

"Mixed use" means the development in a compact urban form of a structure or site with both residential and commercial uses integrated with each other relative to architecture, landscape, common areas, and access.

"Mobilehome" shall have the same meaning as that term is defined in California Health and Safety Code Section 18008.

"Mobilehome park or subdivision" means a parcel (or contiguous parcels) of land divided into two (2) or more mobilehome lots for sale or rent.

"Motel" means an establishment otherwise defined as a hotel with at least twenty-five (25) percent of all rooms having direct access to the parking areas without the necessity of persons passing through the main lobby of the building.

"Motor vehicle" means a machine capable of self-propulsion, with or without human guidance, whether for the performance of work or as a mode of transportation.

"Multifamily," where referenced in this Code to determine applicable development standards and requirements, shall apply to all uses in the ~~RM-1, RM-2, and RM-3~~ zoning districts that permit multifamily dwellings, regardless of the type of housing (i.e., attached or detached), and to similar developments in a PUD, where the PUD does not contain a specific standard.

"Multifamily dwelling" means a building, or portion of a building, used and/or designed as a residence with three (3) or more separate living quarters ~~dwelling units~~ (e.g., apartments, condominiums, or townhomes), or any residential structure located within a tract mapped for condominium purposes.

Chapter 16.04 ZONING DISTRICTS DESIGNATED

16.04.010 Zoning districts established.

The following districts and overlay districts are established to carry out the purposes of this Code:

District	Abbreviation
Agriculture-Ranch	R-A
Rural Residential	R-R
Low Density Residential	R-S
Medium Density Residential	RM-1
High Density Residential	RM-2
Very High Density Residential	RM-3
Medium Density Housing	MDH
Mixed Use Housing	MUH
Urban High Density Housing	UHDH
Very High Density Housing	VHDH
Neighborhood Commercial	C-N
Freeway Commercial	C-F
Mixed Used	MU
Commercial Office	C-O
General Commercial	C-G
Commercial Recreation	C-R
Business Park	BP
Light Industrial	LI
Institutional—Private	I-1
Institutional—Public	I-2
Public Park	PP
Private Open Space	OS-1
State Park[1]	
Public Open Space	OS-2
Planned Development	PD
Fire Safety Overlays	(FR1)&(FR2)
Geologic Hazard Overlay	(GH)
Biotic Resources Overlay	(BR)
Scenic Resources Overlay	(SR)
Small Lot Overlay	(SL)

[1] The California Department of Parks and Recreation controls Chino Hills State Park (State Park), so the City of Chino Hills' Zoning ordinance does not apply to the Chino Hills State Park (see California Public Resources Code Section 51001); this District is shown on the City's Zoning Map for informational purposes only.

(Ord. 68 § 9.05.010, 1995; Ord. No. 383, § 6(Exh. B), 5-25-2022)

16.04.020 Adoption of Zoning Map.

The Zoning Map of the City of Chino Hills, dated November 14, 1995, or as subsequently amended, and on file with the City Clerk, is adopted by reference and shall hereafter exist pursuant to and as an integral part of this Development Code.

(Ord. 68 § 9.05.020, 1995)

16.04.030 Uncertainty of boundaries.

Where uncertainty exists as to zone boundaries of any zone district shown upon the Zoning Map, or any part of such map, the following provisions shall apply:

A. Where zone boundaries are shown as approximately following legal lot lines or the right-of-way lines of highways, streets, or alleys, such lines shall be the zone boundaries. In all other cases where a district abuts a highway, street, or alley, the zone boundaries shall extend to the centerline of the highway, street, or alley.

B. In the case of unsubdivided property where a zone boundary divides a lot, the location of the boundary, unless the boundary is indicated by dimensions or legal description, shall be determined by use of the scale appearing on the Zoning Map.

C. Where a public highway, street, or alley, or any portion of such highway, street or alley is officially vacated or abandoned, the vacated or abandoned highway, street or alley shall acquire the zone classification of the property to which the vacated or abandoned portion reverts.

D. Any submerged lands to be reclaimed by fill for use as a land area shall be prezoned prior to City approval of the fill. The prezone shall be consistent with the General Plan. Permitted fill activities required in an emergency for the protection of public health or safety shall be exempt from this requirement.

(Ord. 68 § 9.05.030, 1995)

Chapter 16.05 - Draft Objective Design Standards

1 Introduction

Purpose

Since 2017, the California legislature has adopted and amended several housing and land use laws to address the state's housing crisis. Senate Bill (SB) 35, SB 167, SB 330, SB 423, and Assembly Bill (AB) 168 are aimed at streamlining land use entitlements for housing development projects as defined in §65589.5 (h)(2).

- SB 35 (2017) streamlines housing development approvals on infill sites that comply with "objective standards," meet minimum affordability requirements, are not environmentally sensitive, and if the developer pays prevailing wage and uses a "skilled and trained workforce" for projects over a certain threshold.
- SB 167 (2017) prohibits a local agency from disapproving or conditioning approval in a manner that renders infeasible, a housing development project for very low, low-, or moderate- income households, or an emergency shelter, unless the local agency makes specific written findings based upon substantial evidence in the record.
- SB 330 (2019) establishes a preliminary application process that allows developers to lock in city ordinances, policies, and development fees prior to filing a complete application and requires that project applications are subject to no more than five public hearings if the applicable objective standards are met.
- SB 423 (2023) extends SB 35 until January 1, 2036, and expands upon its applicability including specified hazard zones and some high fire hazard severity zones. It prohibits local governments from requiring, prior to approving a qualifying development, compliance with any standards necessary to receive a post-entitlement permit. This bill also amends the required labor standards for mixed-income projects.
- AB 168 (2020) creates a process for tribal scoping consultation for housing development proposals seeking review under SB 35.

The legislation discussed above is intended to streamline the housing development approval processes in California. State law requires cities to approve certain eligible housing proposals through ministerial processes based on objective standards that "involve no personal or subjective judgement by a public official and are uniformly verifiable by reference to an external and uniform benchmark or criterion available and knowable by both the development applicant and the public official prior to submittal." The Objective Design Standards (ODS) provide clear expectations on the design of new multi-family residential development within the city, outlining objective design standards that allow for predictable development outcomes.

The purpose of the Objective Design Standards is to give the community, developers, staff, and decision makers more certainty about what future multi-family residential and mixed-use development will look like as the City moves forward with streamlined processes to meet the State's goals in addressing the housing crisis and the objectives of the City's Housing Element. The design standards within this document are minimum standards. The ODS document is organized as a checklist that is to be used by developers, designers, and city staff to review and approve multifamily development. The project must also comply with all applicable building permit requirements, zoning code requirements, and other planning related documents.

Applicability

The ODS document provides guidance and design standards for multifamily residential or mixed-use developments that include multifamily housing in the following zones:

- Medium Density Residential (RM-1)
- High Density Residential (RM-2)
- Very High Density Residential (RM-3)
- Mixed Use (MU)
- Medium Density Housing (MDH)
- Mixed Use Housing (MUH)
- Urban High Density Housing (UHDH)
- Very High Density Housing (VHDH)

Definitions

Alcove. A recess in a wall that is partially enclosed by vertical elements such as walls or pillars.

Architectural Feature. Soffit, column, wing wall, canopy, roof eave, balcony, bell tower, spires, clock tower, cupolas, turrets, and any other similar element that does not create an interior floor space.

Blank Wall. Any wall that is not enhanced by architectural detailing such as artwork, landscaping, windows, doors, balconies, siding, trellis, metal accent panels, or similar features. Solid and mechanical doors and glass with less than 80 percent transparency are considered blank wall areas.

Brackets. A projection from a vertical surface providing structural or visual support under cornices, balconies, windows, or any other overhanging member.

Column. A vertical masonry support.

Complementary Architectural Style. Two structures are complementary in architectural style if they have the same roof form, 75 percent of materials and colors are the same (i.e., uses three of the four same materials and/or colors), and have similar massing.

Courtyard. An open space, usually enclosed by buildings or walls, which is primarily intended for outdoor use within a building or development.

Duplex. A residential building comprised of two separate living units.

Development Code. Title 16 of the Chino Hills Municipal Code, including Appendices A through E.

Entablature. A horizontal structural element frequently supported by columns or pilasters. It consists of three horizontal layers: the architrave, the cornice, and the frieze.

Façade Plane. Any stretch of a building façade existing along the same axis line, regardless of pattern differentiation or change in rhythm.

Fenestration. The stylistic arrangement of windows in a building.

Fourplex. A residential building comprised of four separate living units.

Foot-candle. A unit of illuminance or light intensity. The foot-candle is defined as one lumen per square foot.

Gable roof. A ridge roof that slopes up from only two walls. A gable is the vertical triangular portion of the end of a building from the eaves to the ridge of the roof.

Grade. All related terms shall be defined according to the definition contained in the California Building Code, incorporated by reference and amended in Title 15 of the Chino Hills Municipal Code.

Header. A structural element, typically a beam or lintel, placed horizontally above an opening such as a door or window.

Massing. The overall size, shape, and arrangement of a building or group of buildings.

Mid-rise Multifamily Building. A four to six story building with a maximum building height of 80 feet. Four-story buildings include apartments with surface parking or a wraparound parking structure. Five- and six-story housing products include wrap and wood structure podiums. Mid-rise multifamily buildings are permitted in the MUH, UHDH, and VHDH zones.

Mixed Use Project. As defined in Section 16.02.250 of the Chino Hills Development Code.

Multifamily Dwelling. As defined in Section 16.02.250 of the Chino Hills Development Code.

Open Space, Public. A publicly accessible park, square, plaza, or similar space. Does not include common open spaces shared exclusively by residents of a single development.

Orientation. Building orientation refers to the placement of a building on a site, considering its surroundings and the positioning of windows, rooflines, and other architectural features to optimize and enhance the overall aesthetic of the façade.

Ornamental Feature. A sculpture, fountain, relief, or any other decorative element that does not provide shelter, is non-structural, and is not a sign, and which serves to enhance visual interest.

Parkway. Land area between street curb and sidewalk.

Paseo. A pedestrian pathway or walkway extending from the street into the interior of a block. Paseos may be publicly accessible or limited to private use.

Patio Area. An outdoor space attached to a unit which typically includes concrete or pavers, and used as private yard area.

Podium Configuration. A building design where the construction is built in two different construction methodologies - typically concrete construction on the lower level(s) and wood framing above. Typically, non-residential uses and/or parking garages are included on the lower level and residential units above.

Recreational Amenities. An amenity provided by the building that is communal and available to all occupants for recreational and social purposes. Recreational amenities may include the following: picnic/barbeque areas, park benches, cabana or shade trellis areas, passive water features (e.g. fountain), passive recreation areas and/or gardens, dog park, clubhouse, swimming pool either with or without a sauna and/or jacuzzi, tot lots, an exercise structure or complex (e.g. playground, gym), full or ½ scale sports courts for volleyball/tennis/pickleball/basketball/soccer, etc., and other recreational amenities subject to review and approval.

Sill. The horizontal bottom portion of a window or door frame.

Step back. The vertical or horizontal recess or setback of a building's upper floors from the lower floors.

Stoop. A small staircase ending in a platform leading to the entrance of an apartment building or rowhouse.

Street Wall. The wall of a building facing the street or near the street-abutting property line. The street wall may include arcades, colonnades, recessed pedestrian entrances, decorative stairs, public art, and other features deemed pedestrian-oriented.

Terrace. An elevated outdoor space that is attached to a building, provided either by a purpose-built platform on the ground level or by the parapet roof of the story below.

Townhome. A multistory housing structure that is attached to one or more similar houses by shared walls.

Triplex. A residential building comprised of three separate living units.

Wrap Configuration. A building design where a portion of the building wraps around an interior parking or other structure, thereby screening the interior structure from public view.

2 Standards by Building Type

Low-rise Buildings

Low-rise multifamily buildings are two or three stories with a maximum building height of 42 feet. The housing products include townhomes, duplex, triplex, fourplex, and courtyard. Low-rise multifamily buildings are permitted in the RM-1, RM-2, RM-3, MU, MDH, and VHDH zones. Site design for low-rise multifamily buildings must include the following.

Design Standards	Yes	No	N/A
A. Building Coverage is specified in Chapter 16.10 and 16.15 of the Development Code.			
B. Parking spaces are specified in Chapters 16.15 and 16.34 of the Development Code.			
C. Setbacks facing public streets shall be landscaped with the exception of driveways and walkways leading from the street to the unit or group of units. Landscaping shall comply with Chapter 16.07 of the Development Code and the Water Efficient Landscape Ordinance.			
D. Primary entry is protected with at least one of the following features: overhangs, recesses, porches, trellises, or other weather-protection features covering an area at least three feet in depth and five feet in width. Encroachments of these features into required setbacks must be consistent with the zoning code.			
E. A building or unit entrance must be provided at a frequency of at least one entrance every 50 feet along any street fronting elevation. Shared main entrances must be provided at least every 100 feet along any street frontage.			
F. Rooflines shall be vertically articulated at least every 50 feet along the street frontage, through the use of architectural elements such as parapets of varying height (at least 12 inches), varying cornices, reveals, or varying roof height and/or form.			
G. Buildings longer than 150 feet shall have parking accessible from a rear aisle, alley, or a lot across a drive, aisle, or street.			
H. Buildings longer than 150 feet shall have a vertical massing break of at least four feet across and at least 75 percent of the height of the building façade.			

Mid-rise Buildings

Mid-rise multifamily buildings are four to six stories and a maximum building height of 80 feet. Four-story buildings include apartments with surface parking or a wraparound parking structure. Five- and six-story housing products include wrap and wood structure podiums. Mid-rise multifamily buildings are permitted in the MU, MUH, UHDH, and VHDH zones.

Site design for mid-rise multifamily buildings must include the following.

Design Standards	Yes	No	N/A
A. Building Coverage is specified in Chapter 16.10 and 16.15 of the Development Code.			
B. Parking spaces are specified in Chapter 16.15 and Chapter 16.34 of the Development Code.			
C. For mixed-use, ground-floor shops, or office, each shall have individual entries along the adjacent drive, aisle, or street.			
D. Residential ground-floor uses in multifamily buildings shall be no more than four feet above the public sidewalk grade if setback is 15 feet or less.			
E. The ground-floor elevation shall consist of at least one of the following (note that the ground floor can include a combination of these elements, but each portion of the ground floor must provide at least one of these elements): a. A line of awnings or canopies over ground-floor storefronts b. For ground floor commercial uses, unobstructed transparent glass for at least 65 percent of the elevation area of the ground floor. See Figure 1 c. A different exterior cladding material than the middle/body which is separated from the middle/body above by either an overhang or recess of two feet or more, or a horizontal belt course with a dimension of at least 12 inches, consisting of a different color or material separating the base from the middle section. d. A series of individual residential entries with entryways recessed a minimum of three feet. e. A series of individual residential entries with projections of a minimum of three feet.			
F. If an elevator is required per California Building Code, elevator towers shall utilize the same color, design, and materials as the building.			

Figure 1 Midrise Buildings Commercial Ground Floor



3 Building Orientation

Building Location and Orientation

Building location and orientation standards provide unity and quality development of residential areas. Building location and orientation must include the following.

Design Standards	Yes	No	N/A
A. Setbacks shall be provided in accordance with the underlying zoning district and the regulations provided in Chapter 16.10 and 16.15 of the Development Code.			
B. Buildings shall be oriented toward the public and private streets to define the street edges. Buildings on corner lots shall be oriented toward the primary intersection and shall be designed with dual orientation.			
C. Dense landscaping and/or architectural treatments shall be provided to screen façades facing the freeway.			
D. Primary pedestrian entrances for each residential unit (or the single primary pedestrian entrance if shared) shall face the public or private street, a shared pedestrian walkway, or a common courtyard. Primary pedestrian entries for individual units fronting side property lines shall provide an alcove, recess, overhang, porch, trellis, or other weather-protection feature, or shall be oriented to not face doors and windows of uses on adjacent properties. See Section 5 Architectural Elements for additional requirements for entries and porches.			
E. Multifamily residential buildings shall be arranged to create outdoor spaces such as courtyards, pathways, paseos, and recreational areas, with windows facing the outdoor spaces. See Figure 2.			
F. Buildings incorporating enclosed parking on the ground level shall provide a minimum three-foot setback from adjacent drive aisles.			

Figure 2 Building Location and Orientation Windows Facing Pathway



4 Building Massing and Articulation

Massing Breaks and Articulation Features

Building massing and articulation standards are designed to create massing breaks and articulation features on elevations facing public streets and common open spaces. Massing breaks and articulation features must include the following

Design Standards	Yes	No	N/A
A. Buildings shall have minor massing breaks at least every 50 feet along the street frontage. Minor breaks shall be a minimum of two feet deep and eight feet wide with a vertical length of at least 60 percent of the height of the building.			
B. Buildings over three stories shall have major massing breaks at least every 100 feet along any street frontage, adjacent public park, publicly accessible outdoor space (whether public or private), or designated open space, through the use of varying step backs and/or building entries. a. Major breaks shall be a minimum of five feet deep and 25 feet wide and shall extend at least 75 percent of the height of the building. Exceptions include buildings with upper stories (above first floor) stepped back at least five feet, in which case the major break need only extend 75 percent of the height of the portion of the front façade that is not stepped back. See Figure 3.			
C. Multifamily buildings shall be designed to create varying roof forms and break up the massing of the building by using at least one of the following techniques: a. A change in parapet wall or roof height of at least one foot for a distance of at least 50 feet; or b. A change in roof pitch, form, or direction; or c. Inclusion of dormers, gables, parapets, chimneys, and/or varying cornices; or d. Varying roof height and/or form; or e. Clerestory windows above eye-level to admit light, fresh air, or both. See Figure 4.			
D. Rear and side elevations that are exposed to public view shall be consistent with the same number of architectural treatments as the front elevations.			
E. Untreated blank walls over 15 feet in height and 20 feet in length visible from a public street or a pedestrian-oriented space (such as a park, common open space, or pedestrian pathway) are prohibited. Methods to treat blank walls can include: a. Landscape planting bed at least five feet deep or a raised planter bed at least two feet high and three feet deep in front of the wall with planting materials that are sufficient to obscure or screen at least 60 percent of the wall's surface within three years. b. Installing a vertical trellis in front of the wall with climbing vines or plant materials. c. Special building detailing that adds visual interest. Such detailing must use a variety of surfaces. Examples include mosaics, fountains, ornamental detailing, or inclusion of highly textured surface materials such as natural stone.			
F. Long, unbroken rooflines are to be avoided. Upper and lower stories must be distinguished by incorporating features applied to the transitions between any floors, except where otherwise specified. These features shall be one or more of the following: a. A change in façade materials, along with a change in plane at least one inch in depth at the transition between the two materials; or b. A horizontal design feature, such as a belt course; or c. Brackets; or d. Gable roof; or e. Columns; or f. Variation in the patterns or types of fenestration or details.			

Design Standards	Yes	No	N/A
G. Buildings facing public street corners shall incorporate the same level of articulation on both street-facing elevations and incorporate at least one of the following: a. Wrap–around porches, courtyards, or balconies; or b. Wrap–around window or enhanced window treatments such as trim surrounds, shutters, awnings, and/or bay windows; or c. A Roof plane break of at least one foot on each street facing elevation; or d. Cropped building corner with an entry feature; or e. Other creative elements that meet the intent of this standard and are consistent with the architectural style, subject to review of the Planning Division.			
H. Building façades of four or more units facing internal drive aisles shall incorporate two or more of the following treatments: a. Massing offsets, including layered wall planes, recesses, or cantilevers of at least one foot in depth for second or third story. b. Variety of garage door colors and designs. c. Trellises. d. Balconies.			
I. Buildings facing a common drive aisle shall have a minimum separation of 28 feet at the narrowest point.			
J. Buildings facing common open space shall have a minimum separation of 15 feet at the narrowest point for two-story elevations, 20 feet at the narrowest point for three-story elevations, and 25 feet at the narrowest point for four-story and higher elevations.			

Figure 3 Massing Breaks and Articulation Features

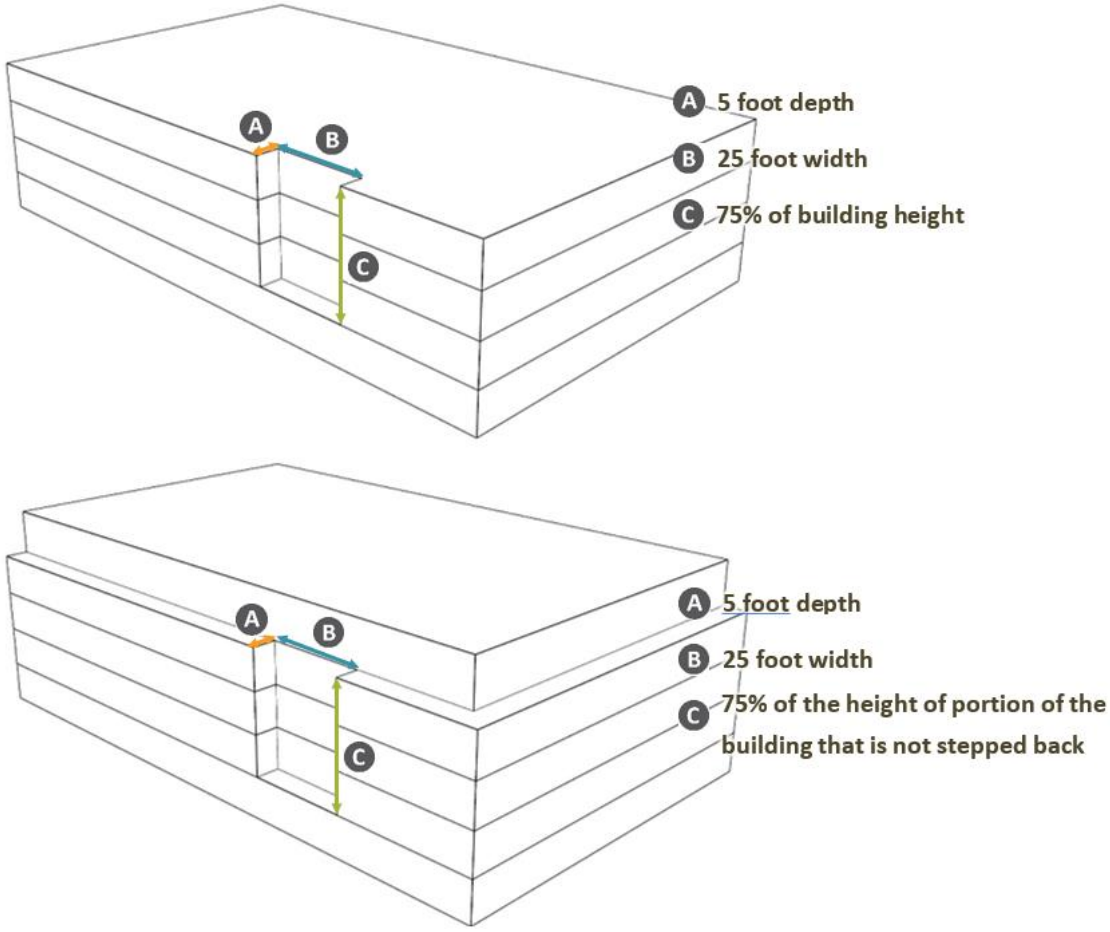


Figure 4 Varying Roof Heights and Pitch



5 Architectural Elements

Architectural standards incorporate elements and details that provide individuality to each project, while also maintaining consistency in overall character. The standards for architectural elements are as follows.

Roofs

Design Standards	Yes	No	N/A
A. Rooflines shall be vertically articulated at least every 50 feet along the street frontage, using architectural elements such as parapets, varying cornices, reveals, clerestory windows, or varying roof height and/or form.			
B. If a building has a pitched roof, an eave overhang of at least 18 inches is required. Rakes at gable ends shall project at least four inches. Buildings for projects located in the Fire Hazard Overlay shall have an eave overhang of at least 8 inches.			
C. Roof materials shall have a matte finish to minimize glare.			

Entries

Design Standards	Yes	No	N/A
A. Each unit or building entry shall be easily identifiable and distinguishable from the street, drive aisle or common open space. Means of distinguishing an entryway include door color, door size and style, recessed entry, step up entry, and the incorporation of awnings, landscaping, and/or contrasting trim.			
B. Exterior building entry doors and entry ways shall be protected with at least one of the following features: overhangs, recesses, porches, trellises, or other weather-protection features. The entry shall have a depth or projection of at least five feet and a width of at least three feet. If Building or Fire code requirements would restrict compliance with the minimum projection, the weather protection feature shall be built to the maximum dimensions allowed, provided the weather feature is no less than 18 inches.			

Porches

Design Standards	Yes	No	N/A
A. Porches, where provided, shall have a minimum depth of six feet, including posts or columns, and a width of four feet. Roof elements, eaves, supports, and railings of the porch shall be consistent with the architectural style.			
B. Where provided, covered porches shall be required to break up volumes between lower and upper floors.			

Patio Walls and Gates

Design Standards	Yes	No	N/A
A. Low walls and gates for patios, where provided, shall use similar or same colors, materials, and/or design elements used for the building architecture.			
B. All patio areas and private open space shall measure a minimum of eight feet by five feet.			
C. Projects with a covered porch that extend from the building greater than four feet shall be supported by columns.			

Balconies

Design Standards	Yes	No	N/A
A. Where provided, a minimum depth of four feet is required for balconies (except for ornamental or Juliet balconies). Scuppers or internal drains are required on all balconies for drainage.			
B. Long balconies that provide access to more than three units shall be prohibited. Balconies shall either be recessed or projecting.			

Fenestration

Design Standards	Yes	No	N/A
A. Windows and doors facing a public street, or a pedestrian-oriented space shall be trimmed, recessed, and/or incorporate enhancement details such as headers/sills, shutters, trellises, awnings, or pop-outs. When trimmed, the trim material shall be a minimum of three inches in width by three-quarter inches in depth when protruding from the wall. When recessed, the minimum depth shall be one-and-a-half inches from the adjacent wall surface. See Figure 5. Elevations with contemporary or modern design may have trims less than three inches wide, windows without trims, or be flush with the adjacent surface, provided that varied window sizes are used, and at least 30 percent of the residential portion of the façade consists of windows.			
B. Windows on the upper floor(s) of a building shall be treated with the same or similar window treatments as those on the ground floor.			
C. Mirrored or highly reflective glass is prohibited.			

Figure 5 Fenestration Trim, Recessed, and Shutters



Colors and Materials

Design Standards	Yes	No	N/A
A. Buildings shall incorporate a maximum of two main body colors, three accent colors, and three different materials, excluding windows, doors, trim, or signs. Exterior elevations shall include at least two colors and at least different materials (in addition to glazing, window trim, doors, railings, , or signs) that can accentuate building masses. The main body color is the predominant color used on the face(s) of the building.			
B. Accessory structures such as garages, carports, and enclosures for mechanical, utility, and service areas shall include no more than two deviations in material or color from the primary structure. Accessory structures not visible from the street or neighboring properties may deviate from this standard.			
C. Reflective surfaces and materials such as mirrored glass and polished aluminum are prohibited.			
D. Material and color changes shall occur at an inside corner, underside of a massing element, or wrapped to an appropriate termination point such as a roof break, half-column, bay window, or enhanced trim element. See Figure 6.			

Figure 6 Material and Color Changes



Accessory Structures

Design Standards	Yes	No	N/A
A. Accessory Dwelling Units, carports, detached garages, and other accessory structures shall coordinate materials, patterns, and colors with the architectural style of the primary buildings.			

Solar Panels

Design Standards	Yes	No	N/A
A. Solar panel frames must be colored to complement the roof. Mill finish aluminum frames are prohibited.			
B. Solar support equipment shall be painted to match the color of the building.			

6 Access and Circulation

Access and circulation standards provide a consistent element of safety and efficient circulation for pedestrians, vehicles, and cyclists. The standards for access and circulation are as follows:

Pedestrian Pathways

Design Standards	Yes	No	N/A
A. Provide a pedestrian pathway from the building entries to a sidewalk, to an alley or a court drive leading to a sidewalk, or to a pathway network within the development site that connects to a public sidewalk.			
B. For development sites with multiple buildings, pedestrian pathways connecting businesses, parking areas, and residential building entries on the same site shall be provided.			
C. Surface parking lots shall be connected to all building entrances by means of internal pedestrian walkways. Parking lot pedestrian walkways shall be not less than six feet wide.			
D. Pedestrian walkways must be provided along the perimeter of all parking areas adjacent to buildings so as to create a buffer between parking areas and the buildings.			
E. Pedestrian walkway lighting mounted to building walls or freestanding poles shall not be placed higher than 12 feet above grade or the walkway surface. These lights shall be fully shielded or set back from the property line a minimum distance equal to the height of the light fixture to confine lighted area to within the property. In no case shall direct light rays trespass onto neighboring properties.			
F. Pedestrian pathways shall be designed to comply with the Americans with Disabilities Act (if required) and Title 24 of the California Code of Regulations.			
G. All utility equipment shall be located outside of the primary pedestrian path of travel. If utility equipment must encroach in the pedestrian path of travel, ensure a minimum paved clearance of three feet for ADA passage around equipment.			

Vehicular and Emergency Access

Design Standards	Yes	No	N/A
A. Parking areas and garages within a development site shall be internally connected via a roadway network that leads to a public street.			
B. Site circulation shall be designed to facilitate emergency access and comply with the Fire Department standards and refuse service provider standards.			
C. Vehicular driveways with access to the public right of way shall have sidewalks or pedestrian connections on at least one side of the driveway.			
D. Vehicular access shall be provided through the alley when present. For lots without an alley, vehicular access shall be provided from the secondary street.			
E. Vehicular access paths shall have a minimum width of 22 feet, or 26 feet where required for emergency access.			

Off-Street Parking Areas

Design Standards	Yes	No	N/A
A. Off-street parking areas and carports for multifamily residential development shall conform with the underlying zoning district and the regulations provided in Chapters 16.15 and 16.34 of the Development Code.			
B. Alley access, when available, shall be utilized when garage parking is proposed. This arrangement is intended to provide maximum landscaping at the street edge, as well as front facades dominated by porches and entries instead of garage doors.			
C. Garage doors shall be set back a minimum of three feet, and a maximum of five feet, from adjacent drive aisles.			
D. Landscaping shall be provided along drive aisles in between individual garage door entrances and/or aprons. See Figure 7.			
E. Building façades of four or more units facing a drive aisle with garage doors shall incorporate at least two of the following elements: a. Garage door recess of at least one foot in depth from façade. b. Trellis or roof overhang above garage door of at least one foot in depth. c. Variety of at least two different garage door designs and colors. d. Trim around garage door of contrasting material, with minimum dimensions of three inches in depth and six inches in width. See Figure 7.			

Figure 7 Garage Door Design Features



7 Landscaping, Walls and Fences, Lighting

Visibility Clearance Areas

Maintaining standard visibility clearance areas ensures that there will be no interference with mobility and visibility within developed areas. Visibility clearance areas must meet the following standard.

Design Standards	Yes	No	N/A
A. A visibility clearance area shall comply with Section 16.06.080 of the Development Code.			

Walls and Fencing

Consistency in walls and fencing provide enhanced privacy and safety, while still maintaining matching architectural styles. Walls and fencing must meet the following standards.

Design Standards	Yes	No	N/A
A. Fence and wall materials, colors and detailing shall match the architectural style of buildings on the site. Permanent chain link fencing, razor wire, and barbed wire are prohibited.			
B. Freestanding solid walls of at least 30 inches in height, if included, shall be setback at least two feet from the sidewalk and incorporate low plantings or vines placed between the sidewalk and the fence or wall to soften the appearance of the wall and preserve the public parkway environment.			
C. All fences and walls required for screening purposes shall be of solid material. Chain link fencing with inserts is prohibited.			

Lighting

Lighting standards provide a desirable level of illumination that increases safety and avoids light pollution. Lighting must meet the following standards.

Design Standards	Yes	No	N/A
A. Lighting shall be shielded and directed downward, and the location of lights coordinated with the approved landscape plan.			
B. Exterior lamps shall be low wattage, LED, and except for outdoor holiday lights, shall not be colored.			
C. Outdoor lighting shall be installed and maintained along all vehicular access ways and major walkways.			
D. Bollard lighting may be used to light walkways and other landscape features but shall cast light downward.			
E. All parking lot lights shall be full-cutoff luminaires, as certified by the manufacturer, with the light source directed downward and away from adjacent residences.			
F. Exterior and parking-lot lighting shall not exceed 0.1 foot-candle at adjacent residential property lines. Exterior and parking lot lighting shall not exceed 0.5 foot-candle at the adjacent rights-of-way or adjacent mixed-use or non-residential properties.			
G. Streetlights shall use decorative lighting poles that use the same colors, materials, designs as other elements used in the community.			
H. Lighting shall be placed so as to minimize its impact on adjacent buildings and properties, especially residential uses. Any lighting source, including illuminated signs, shall be positioned so that light does not shine directly into residential windows.			
I. Building-mounted lighting shall be decorative in nature and shall be a complimentary style to the architectural style of the building.			

Landscape Elements

To achieve a cohesive appearance and compatibility of a new project with its surroundings, landscape elements must meet the following standards.

Design Standards	Yes	No	N/A
A. Proposed projects shall include at least three of the following landscape elements in the landscape plan: a. Pedestrian-scaled lighting (bollards and/or landscape lighting) b. Fountains c. Decorative paving d. Landmark tree (48-inch box minimum) e. Seating opportunities such as raised planters and walls. f. Shade structures such as free-standing trellises and canopies.			
B. Landscaping shall contain a combination of low (3 – 24 inches), medium (2 – 5 feet) and tall (5 + feet) plant materials. For example, low planting may be used in the foreground, proceeding back to the tallest in the background. See Figure 8.			
C. In townhouse or rowhouse type projects, trees and/or planting of at least six square feet shall be provided adjacent to garage doors facing alleys and motor court drives to soften the appearance of the building. Structures consisting of four or more garages that serve rowhouse or stack flat units, shall include a landscape area on each end of the building no less than three feet in depth and shall span the entire length of the side or rear of the building.			
D. A minimum of five-foot-wide landscaping shall be incorporated around the base of buildings (except for walkways and driveways) to soften the edge between parking, drive aisles, and sidewalks.			
E. Projects shall provide required open space consistent with Chapter 16.08 of the Development Code.			
F. Projects shall provide landscape coverage consistent with Chapters 16.10 or 16.15 of the Development Code, dependent on the zoning designation of the site.			

Figure 8 Landscape Elements



8 Utility and Service Areas

Utility and service area standards are in place to minimize visual clutter and maintain efficient service areas.

Refuse and Recycling Material Storage Areas

Refuse and recycling material storage areas must meet the following standards.

Design Standards	Yes	No	N/A
A. Refuse and recycling material containers shared by multiple dwelling units shall be enclosed and screened in accordance with Section 16.10.060 of the Development Code. Sizing of the enclosures shall conform to the requirements of the City's Franchise Waste Hauler.			
B. Refuse enclosures shall incorporate roof structures to help improve stormwater quality in accordance with the National Pollutant Discharge Elimination System (NPDES) requirements and to screen the enclosure from views from above.			

C. Refuse enclosures shall be finished using materials and colors that are consistent with the buildings architectural style. Enclosure gates shall be opaque.			
D. Detached refuse enclosures located within 20 feet from doors or operable windows of adjacent structures shall be fully enclosed on three sides facing the adjacent structure and shall include deodorizer equipment to minimize odor impacts. Refuse enclosures shall not be any closer than 10 feet from any adjacent structure.			
E. Refuse and recycling material containers stored within individual yards shall be screened from street view and from view of adjacent residential portions of the project.			
F. Loading areas and refuse storage facilities shall be as far as possible from residential units and shall be completely screened from view of adjacent residential portions of the project. The location and design of trash enclosures shall account for potential nuisances from odor.			

Loading and Service Areas

Loading and service areas must meet the following standards.

Design Standards	Yes	No	N/A
A. Loading docks and service areas meet the requirements of Chapter 16.34.050 of the Development Code.			
B. One loading space is required in any parking lot with 15 or more spaces serving any nonresidential or mixed use.			

Mechanical and Utility Equipment

Mechanical and utility equipment must meet the following standards.

Design Standards	Yes	No	N/A
A. Mechanical devices such as exhaust fans, vents, and pipes shall be painted to match or complement the adjacent surfaces. Mechanical equipment such as HVAC systems shall be screened from view with landscaping, walls, or a material that complements the building. The materials used for screening shall be painted to match or complement the adjacent surfaces.			
B. With the exception of photovoltaic and solar hot water systems, mechanical and utility equipment shall be screened from view in accordance with Section 16.10.050 of the Development Code and to the extent permitted by the utility and/or service provider. This requirement applies to equipment located on the roof, on the side of a building, and on the ground. The method of screening shall be architecturally integrated with the building design or landscaping.			
C. All electrical utility equipment, electrical meters, and junction boxes shall be placed within a utility room. If a utility room is not feasible, then all utility equipment shall be purposefully designed as an integral part of the building development, placed adjacent to alleyways, within parking areas, or within rear or side yards, and screened from public view.			

Mailboxes

Mailboxes must meet the following standards.

Design Standards	Yes	No	N/A
A. Cluster mailboxes serving 25 or more units shall be located in an enclosure or under a shelter that provides weather protection. See Figure 9.			
B. Cluster mailbox enclosures shall be located to allow for convenient, short-term parking for the mail carriers.			
C. Common mailbox enclosures shall be designed using the same materials and colors as the surrounding residential buildings.			
D. To maintain cleanliness and promote responsible waste disposal, all buildings must provide a trash receptacle in each mailbox area. The trash receptacle must be placed within 5 feet of the mailbox area and must be easily accessible and visible to all users of the mailbox area.			

Figure 9 Cluster Mailboxes



Chapter 16.11 MULTI-FAMILY OWNERSHIP HOUSING AND CONVERSION TO CONDOMINIUM

16.11.010 Intent and purpose.

A. To establish standards for the development of multi-family ownership housing and conversion of existing multi-family rental housing to condominiums.

B. To provide high quality urban design through architectural enhancement, high quality landscaping, and high quality construction.

C. To attempt to balance the opportunity for housing ownerships for all types, for all levels of income and in a variety of locations with the need to maintain a supply of rental housing which is adequate to meet the housing needs of the community.

D. To insure that the purchasers of converted housing have been properly informed as to the physical condition of the structure which is offered for sale.

E. To reduce the impact of conversion on residents in rental housing who may be required to relocate due to the conversion of apartments, condominiums, etc. by providing procedures for notification and adequate time for such relocation.

16.11.020 Definitions.

"Condominium" shall have the same meaning as "Common Interest Development" as defined in California Civil Code Section 1351(c).

16.11.030 Permits required.

A. Development of multi-family ownership housing and conversion of existing multi-family rental housing shall be permitted in appropriately zoned districts within the City subject to the approval of a Site Plan Review and a subdivision map.

B. Notice of a public hearing for the development of multi-family ownership housing shall be provided in accordance with Chapter 16.58 of the Chino Hills Development Code.

C. Notice of a public hearing for the proposed conversion of existing multi-family rental housing to a condominium site shall be sent in writing to each tenants in accordance with Government Code Sections 66452.8, 66452.9, and 66427.1, and any other requirements of the applicable laws requiring that the potential tenants receive notice regarding conversion. The applicant shall provide a list of all tenants to the City at the time that the application is made for a condominium conversion.

16.11.040 Development standards.

Construction of any new multi-family ownership units or conversion of existing multi-family rental units subsequent to the adoption of this chapter shall comply with development standards as set forth in Chapter 16.10, 16.13, and 16.15 and standards as follows:

A. Conformance with the Zoning District. All structures and buildings included as part of a multi-family ownership project or condominium project shall conform to the building and zoning requirements applicable to the zone wherein the project is proposed to be located.

B. Unit Size. The enclosed living or habitable area of each unit shall be consistent with Chapter 16.10, 16.13, and 16.15..

C. Parking and Loading. The total number of required spaces, including accessible parking shall be as specified in the applicable zoning district, Chapter 16.15 and Chapter 16.34 of the Development Code. Non-conforming parking, such as the size of the parking spaces and proximity of the parking spaces to the units served, shall be determined to be acceptable by the Director of Community Development.

D. Private Storage Space. A single area having a minimum of one hundred fifty (100) cubic feet of enclosed private and secure storage space outside of the unit with the smallest dimension not less than two feet shall be provided for each unit. Said storage area may be located within the garage, provided it does not interfere with the required garage area for parking as specified in Chapter 16.34. Customary cupboard or cabinet storage areas installed on the wall within the garage area may count provided the storage area is installed with a minimum of 4 feet above garage surface level. Storage areas within the dwelling unit shall not count towards meeting this requirement except for designated accessible units.

E.

F. Private Open Space. An adjoining private patio or deck shall be provided for each unit. A minimum size of the private patio or deck shall comply with the underlying zoning district standards.

G. Common Open Space. A developed common open/recreation space shall be provided per unit in accordance with the underlying zoning district standards.

H. Landscaping. Landscaping shall be provided for the project in accordance with Chapter 16.07.

I. Laundry Facilities. Separate laundry facilities of sufficient size to allow for the installation of a washer and dryer shall be provided for each unit. If provided in the private garage, said facility shall not encroach into the required garage area for parking specified in Chapter 16.34.

J. Utilities. The consumption of gas, water, and electricity within each dwelling unit shall have a separate shutoff device to disconnect each unit's utilities.

K. Sound Transmission. All permanent mechanical equipment, including domestic appliances, which is determined by the Building Official to be a source or potential source of vibration or noise, shall be shock-mounted, isolated from the floor and ceiling, or otherwise installed in a manner approved by the Building Official to lessen the transmission vibration and noise.

L. Maintenance of Fire Protection Systems. The developer and/or owner of the project shall upgrade the project's water delivery system to comply with the City's current fire flow requirements.

M. Smoke Detectors. Smoke detectors shall be provided per the California Building Code.

N. Fire Wall. A fire rated separation wall shall be required between units in accordance with the California Building Code.

O. Wall and Fences. Walls and fences shall be in accordance with Section 16.06.120.

P. Trash Enclosure. Trash enclosure(s) shall be provided within the development. The total number of trash enclosures to be provided shall be adequate for the development. The color and materials for the trash enclosure(s) shall match the colors and materials for the development.

Q. Condition of Equipment and Appliances. The applicant shall provide written certification to the buyer of each unit after conversion that any dishwashers, garbage disposals, stoves, refrigerators, hot water tanks, and air conditioners that are provided are in working condition as of the close of escrow. At such time as the Homeowners Association takes over management of the development, the applicant shall provide written certification to the Association that any pool and pool equipment and any appliances and mechanical equipment to be owned in common by the Association is in working condition.

16.11.050 Plan Review.

All physical changes, alterations, and or improvements to the project site that require issuance of a building permit shall be subject to the provisions of Title 15 of the Chino Hills Municipal Code.

16.11.060 Application procedures—Requirements.

A. Development of New Multi-family Ownership Housing. The Applicant must submit a Site Plan Review and a subdivision map application signed by the property owner(s) or the authorized agent to the City for review and approval.

B. Conversion of the Existing Multi-family Rental Unit to Condominium (multi- family ownership unit). The Applicant must submit a Conversion Plan and a Subdivision Map that includes the following information:

1. A development plan of the project including:

a. The size of each unit and floor plan with interior dimensions for all rooms.

b. Existing and proposed exterior elevations.

c. The layout and location of all storage space outside of each unit.

d. The layout and location of all facilities and amenities provided within the common area for the enjoyment and use of the unit owners.

e. The layout of all parking spaces to be used in conjunction with each condominium unit.

f. The existing and proposed landscaped areas, the type of landscaping, irrigation, maintenance specification for landscaping and irrigation.

g. The location and size of parking facilities to be used in conjunction with each unit.

h. The location, height, and type of all walls and fences.

i. Location and type of surfacing of all driveways, pedestrian walkways, vehicular parking areas and curb cuts.

j. The location of trash enclosure(s) and trash enclosure details.

k. A photometric lighting plan for the project.

l. The location of and provisions of any unique natural and vegetative site features.

2. A physical elements report prepared by licensed professionals which shall include but not limited to the following:

a. A report detailing the condition and estimating the remaining useful life for each element of the project proposed for conversion, including foundations, buildings, roofs, exterior paint, parking facilities, paved surfaces, mechanical systems, electrical systems, plumbing systems, including sewage systems, swimming pools, sprinkler systems for landscaping, central or community heating and air conditioning systems, fire protection systems including automatic sprinkler systems and alarm systems.

b. A building history report including the following:

i. The date of construction of all elements of the project.

ii. A statement of major uses of said project since construction;

iii. The date and description of each major repair or renovation of any structure or structural element since the date of construction. For the purposes of this subsection, a "major repair" shall mean any repair for which an expenditure of more than one thousand dollars ($1,000.00) was made.

iv. Statement regarding current ownership of all improvements and underlying land.

c. Acoustical Report shall include existing sound transmission between units and recommendations for reduction of excessive noise between the units.

d. Pest Control Report for each unit/structure.

e. Soils and Geology Report addressing evidence of soils problems related to the structures.

f. Statement of repairs and improvements to be made to refurbish/restore the project to the appearance and safety consistent with building code and Development Code.

3. Covenant, Conditions, and Restrictions (CC&Rs). CC&Rs must clearly address maintenance responsibilities for exclusive vs. common use areas and parking requirements, such as mandatory garage parking, etc. The CC&Rs shall be submitted to the City for review and approval prior to recordation of the Final Map.

16.11.070 Findings.

The Commission, and Council on appeal, in acting to approve a construction of multi- family ownership housing or conversion to condominium application, may impose conditions as are reasonably necessary to ensure the project is consistent with the General Plan, compatible with surrounding land use, and meets the provisions and intent of the Development Code.

In making such a determination for construction of multi-family ownership units, the hearing body shall find that the proposed project is consistent with the Site Plan Review finding as indicated in Section 16.76.060.

In making such a determination for conversion to condominium, the hearing body shall find that the proposed project is in accordance with the following principles and standards:

A. The proposed conversion is consistent with the City of Chino Hills General Plan.

B. The proposed conversion is consistent with the City of Chino Hills Development Code, except otherwise provided in this chapter.

C. The overall design (including project amenities) and physical condition of the conversion will result in a project, which is aesthetically attractive, safe, and of quality construction.

D. That the owner has made a reasonable effort to assist those tenants wishing to purchase their units for purposes of minimizing the direct effect on rental housing market created by relocating such tenants.

16.11.080 Appeal.

Appeal shall be in accordance with Chapter 16.58 of the Chino Hills Development Code.

16.11.090 General provisions.

A. Payment of required fees as adopted by the City Council. The fees shall be above and beyond the fees required for affordable housing.

B. A proposed condominium or condominium conversion project may be approved, disapproved or conditionally approved by the Planning Commission in accordance with criteria as set forth in Chapter 16.58 of the Development Code.

C. An approval of the Site Plan Review for a multi-family ownership housing or conversion of existing multi-family rental housing to condominium shall expire if the corresponding tentative subdivision map expires.

Chapter 16.15 - HOUSING PRIORITY ZONING DISTRICTS – PRELIMINARY DRAFT

16.15.010 Intent and purpose.

The purpose of the Housing Priority Zoning District is to implement the goals and policies of the General Plan Housing Element by facilitating development of housing at appropriate densities to accommodate extremely low-, very low-, low-, and moderate-income households consistent with Government Code Section 65583.

The Housing Priority Zoning Districts designate certain sites as suitable for very high density and medium density residential development as described in this Chapter and the Housing Element.

16.15.020 Definitions.

"Allocated Units," for the purposes of this chapter, means the number of units designated by the General Plan Housing Element and Land Use Element to a Housing Priority Zoning District site.

"City Manager" as defined in Chapter 2.08 City Manager

"Determined to be Complete" means that the applicant has submitted a complete application, and it has been determined to be complete pursuant to subsection (C) of Section 16.58.020 of this code.

"Director" means the Community Development Director for the City of Chino Hills or designee.

"Discretionary Permit" means a permit which requires the exercise of judgment or deliberation during the decision-making process, as distinguished from situations where the decision-making is limited to a determination of conformity with applicable statues, ordinances, or regulations. Discretionary permits are based on qualitative standards and require judgment or deliberation by decision makers, such as the Planning Commission or City Council.

"Non-Discretionary Permit" means a permit that involves little or no personal judgment by a decision maker as to the wisdom or manner of carrying out the project. The decision maker merely applies the law to the facts as presented but uses no special discretion or judgment in reaching a decision. A non-discretionary permit involves only the application of objective, quantifiable, written development standards, measurements, conditions, and policies, and the decision maker cannot use personal, subjective judgment in deciding whether or how the project should be carried out.

"Substantially Remodeled" means modifications to any building(s) or structure(s), which modification's valuation is more than 50% of the existing valuation of the buildings at the time of application submittal.

16.15.030 Housing Priority Zoning Districts.

The following Housing Priority Zoning Districts are established in Chino Hills:

1) Medium Density Housing (MDH). The MDH zone permits Medium Density housing consistent with this Chapter.
2) Urban High Density Housing (UHDH). The UHDH zone permits Urban High Density housing consistent with this Chapter.
3) Very High Density Housing (VHDH). The VHDH zone permits Very High Density housing consistent with this Chapter.
4) Mixed Use Housing (MUH). The MUH zone permits Very High Density housing mixed with commercial uses, consistent with this Chapter.

16.15.040 Housing Priority Zoning Districts development standards.

A. Medium Density Housing (MDH) Zone.

1. Applicability: The MDH zone is established to facilitate development of the Housing Element designated "moderate income" sites.

2. Permitted Uses: Permissible uses in the MDH zone are the same as those indicated in Chino Hills Municipal Code (CHMC) Appendix A for the RM-1 zone.

3. Standards: All development in the MDH zone are subject to the following development standards:

a) Residential Density: Minimum residential density shall be built at no less than 9 dwelling units per acre (du/ac) and a maximum of 12.5 du/ac.

b) Development Standards: Development standards for the MDH zone are indicated in Table 1.

Table 1: Medium Density Housing (MDH) Zone–Development Standards

Development Standard	**Minimum Required**
A. Minimum Lot Size Development Minimum Project Area	10,000 sf
B. Minimum Lot Width	N/A
C. Minimum Lot Depth	N/A
D. Maximum Building Height	42 ft.
E. Maximum Lot Coverage	55%
F. Minimum Front Yard Setback	25 ft.
G. Minimum Side Yard Setback:	
(1) Street Side	25 ft.
(3) Interior Side	10 ft.
H. Minimum Rear Yard Setback	15 ft.
I. Minimum Usable Private Open Space	70 sf per unit
J. Minimum Common Open Space	Aggregate of 300 sf per unit
(1) Recreational facilities[(a)]	For projects containing 25 or more dwelling units, provide one recreational amenity for each 25 dwelling units.
K. Minimum Building Separation[(b)]	Pursuant to CHMC 16.10.060 Table 20-3
L. Minimum Landscape	At least 15% of the project area (exclusive of areas within a public right-of-way) must be landscaped.
M. Minimum Parking	Pursuant to CHMC 16.34.060
N. Minimum Residential Design Standards	Pursuant to CHMC 16.05 – Objective Design Standards.

(a) Recreational amenities may include the following: picnic/barbeque areas, park benches, cabana or shade trellis areas, passive water features (e.g. fountain), passive recreation areas and/or gardens, dog park, clubhouse, swimming pool either with or without a sauna and/or jacuzzi, tot lots, an exercise structure or complex (e.g. playground, gym), full or ½ scale sports courts (volleyball/tennis/pickleball/basketball/soccer, etc.), and other recreational amenities subject to review and approval.

(b) Minimum building separations for MDH housing developments in the Fire Hazard Overlay District are subject to CHMC Chapter 16.22.030.B provisions and approval by Chino Valley Fire District and the Director.

B. Urban High Density Housing (UHDH) Zone.

1. Applicability: The UHDH zone is established to facilitate development of the Housing Element designated "lower income" sites.

2. Permitted Uses: Permissible uses in the UHDH zone are the same as those indicated in CHMC Appendix A for the RM-2 and RM-3 zones.

3. Standards: All development in the UHDH zone are subject to the following development standards:

    a) Residential Density: Residential density in the UHDH zone shall be built at a minimum of 30 du/ac, with a maximum of 93 du/ac.

    b) Development Standards: Development standards for the UHDH zone are indicated in Table 2.

Table 2: Urban High Density Residential (UHDH) Zone–Development Standards

Development Standard	Minimum Required
A. Minimum Lot Size Development Minimum Project Area	4 acres
B. Minimum Lot Width	N/A
C. Minimum Lot Depth	N/A
D. Maximum Building Height	70 ft. to roofline, 80 ft. to architectural features
E. Maximum FAR	FAR 2.25
F. Setbacks:	
(1) Boys Republic Drive	5 ft.
(2) City Center Drive	5 ft.
(3) Street side	0 ft.
(4) Interior Side	10 ft.
G. Off street parking areas	Off-street parking areas and carports for multifamily residential development shall be located behind the building when viewed from Shoppes Drive and Civic Center Drive and shall conform to the parking area standards listed in CHMC 16.05 – Objective Design Standards.
H. Minimum Usable Private Open Space	NA
I. Minimum Common Open Space	Aggregate of 150 sf per unit
(1) Recreational Facilities[(a)]	For projects containing 25 or more dwelling units, provide one recreational amenity for each 25 dwelling units.
J. Minimum Building Separation[(b)]	10 ft.
K. Minimum Landscape	At least 15% of the project area (exclusive of areas within a public right-of-way) must be landscaped. May include planted areas with enhanced hardscape.
L. Minimum Parking	Aggregate of the following: Studios and 1 bedroom:- 1 space per dwelling unit 2-3 Bedrooms: 2 spaces per dwelling unit Guest parking: 0.25 space per unit or as otherwise determined through a City approved shared parking analysis.
M. Minimum Residential Design Standards	Pursuant to CHMC 16.05 – Objective Design Standards

(a) Recreational amenities may include the following: picnic/barbeque areas, park benches, cabana or shade trellis areas, passive water features (e.g. fountain), passive recreation areas and/or gardens, dog park, clubhouse, swimming pool either with or without a sauna and/or jacuzzi, tot lots, an exercise structure or complex (e.g. playground, gym), full or ½ scale sports courts (volleyball/tennis/pickleball/basketball/soccer, etc.), and other recreational amenities subject to review and approval.

(b) Minimum building separations for UHDH housing developments in the Fire Hazard Overlay District are subject to CHMC Chapter 16.22.030.B provisions and approval by Chino Valley Fire District and the Director.

C. Very High Density Housing (VHDH) Zone.

1. Applicability: The VHDH zone is established to facilitate development of the Housing Element designated "lower income" sites.

2. Permitted Uses: Permissible uses in the VHDH zone are the same as those indicated in CHMC Appendix A for the RM-2 and RM-3 zones.

3. Standards: All development in the VHDH zone shall be subject to the following development standards:

    a) Residential Density: The permitted residential density in the VHDH zone shall be a maximum of 30 du/ac, and all residential developments in the VHDH zone shall be built at no less than 20 du/ac.

    b) Development Standards: Development standards for the VHDH zone are indicated in Table 3.

Table 3: Very High Density Housing (VHDH)– Development Standards

Development Standard	Minimum Required
A. Minimum Lot Size Development Minimum Project Area	20,000 sf
B. Minimum Lot Width	N/A
C. Minimum Lot Depth	N/A
D. Maximum Building Height 1) When adjacent to residential land use zones 2) When adjacent to nonresidential land use zones	 42 ft. 60 ft. (five stories maximum)
E. Maximum Lot Coverage	70%
F. Setback:	
(1) Eucalyptus Avenue	20 ft.
(2) Peyton Drive	25 ft.
(3) Country Club Drive	25 ft.
(4) Interior Side	10 ft.
G. Off street parking areas	Off-street parking areas and carports for multifamily residential development shall be located behind the building when viewed from Eucalyptus Avenue, Peyton Drive, or Country Club Drive, and shall conform to the parking area standards listed in CHMC 16.05 – Objective Design Standards.
H. Minimum Usable Private Open Space	45 sf. per unit
I. Minimum Common Open Space	Aggregate of 200 sf. per unit
(1) Recreational Facilities[a]	For projects containing 25 or more dwelling units, provide one recreational amenity for each 30 dwelling units.
J. Minimum Building Separation[b]	5 ft.
K. Minimum Landscape	At least 5% of the project area (exclusive of areas within a public right-of-way) must be landscaped.
L. Minimum Parking	Aggregate of the following: Studios: 1 space per dwelling unit 1 Bedroom: 1.5 spaces per dwelling unit 2-3 Bedrooms: 2 space per dwelling unit Guest parking: 0.25 space per unit
M. Minimum Residential Design Standards	Pursuant to CHMC 16.05 – Objective Design Standards

(a) Recreational amenities may include the following: picnic/barbeque areas, park benches, cabana or shade trellis areas, passive water features (e.g. fountain), passive recreation areas and/or gardens, dog park, clubhouse, swimming pool either with or without a sauna and/or jacuzzi, tot lots, an exercise structure or complex (e.g. playground, gym), full or ½ scale sports courts (volleyball/tennis/pickleball/basketball/soccer, etc.), and other recreational amenities subject to review and approval.

(b) Minimum building separations for VHDH housing developments in the Fire Hazard District are subject to CHMC Chapter 16.22.030.B provisions and approval by Chino Valley Fire District and the Director.

D. Mixed Use Housing (MUH) Zone.

1. Applicability: The Mixed Use Housing zone is established to facilitate development of the Housing Element designated "lower income" sites within commercial centers.

2. Permitted Uses: Permissible residential uses in the MUH zone are the same as those indicated in Chino Hills Municipal Code (CHMC) Appendix A for the MU zone.

3. Standards: All projects in the MUH zone shall be subject to the following development standards:

    a) Residential Density: Residential densities permitted in the MUH zone range from 30 du/ac to a maximum of 47 du/ac. All residential development in the MUH zone must be built at a density of no less than 20 du/ac.

    b) Residential Development Standards: Development standards for residential uses in the MUH zone are indicated in Table 4.

Table 4: Mixed Use Housing (MUH) Zone– Residential Development Standards

Development Standard	Minimum Required
A. Minimum Lot Size Development Minimum Project Area	1 acre
B. Minimum Lot Width	N/A
C. Minimum Lot Depth	N/A
D. Maximum Building Height	80 ft.
E. Maximum Lot Coverage	N/A
F. Setbacks:	
(1) Shoppes Drive	10 ft.
(2) Boys Republic Drive	5 ft
(3) State Route 71	20 ft.
(4) Chino Hills Parkway	20 ft.
(5) Interior Side	10 ft.
G. Off street parking areas	Off-street parking areas and carports for multifamily residential development shall be located behind the building when viewed from Shoppes Drive or Boys Republic Drive, and shall conform to the parking area standards listed in CHMC 16.05 – Objective Design Standards.
H. Minimum Building Separation[(a)]	0 ft
I. Minimum Landscape	At least 10% of the project area (exclusive of areas within a public right-of-way) must be landscaped.
J. Minimum Parking	Aggregate of the following: Studios (10 units or less): 1 per dwelling unit Studios (for each additional unit above 10 units): 1.25 per dwelling unit 1 Bedroom: 1.5 per dwelling unit 2-3 Bedrooms: 2 per dwelling unit Guest parking: 0.25 per unit or as otherwise determined through a City approved shared parking analysis.
K. Minimum Residential Design Standards	Pursuant to CHMC 16.05 – Objective Design Standards
(a) Minimum building separations for housing developments in the Fire Hazard District are subject to CHMC Chapter 16.22.030.B provisions and approval by Chino Valley Fire District and the Director.	

c) Commercial Development Standards: Development standards for commercial uses in the MUH district are indicated in Table 5.

Table 5: Mixed Use Housing (MUH)– Commercial Development Standards

Development Standard	Minimum Required
A. Minimum Lot Size Development Minimum Project Area	1 acre
B. Minimum Lot Width	N/A
C. Minimum Lot Depth	N/A
D. Maximum Building Height 1) For buildings with more than 50% of its area used for residential 2) For buildings with less than 50% of its area used for residential	 80 ft. 45 ft.
E. Maximum Lot Coverage	N/A
F. Minimum Side Yard Setback:	
(1) Shoppes Dr.	10 ft.
(2) Boys Republic Dr.	5 ft.
(3) State Highway 71	15 ft.
(4) Chino Hills Parkway	20 ft.
(5) Interior Side	10 ft.
G. Minimum Building Separation[(a)]	10 ft.
H. Minimum Landscape	At least 20% of the project area (exclusive of areas within a public right-of-way) must be landscaped.
I. Parking Lot Landscaping	At least 5% of surface parking lot areas (exclusive of loading areas) must be landscaped. This landscaping may be counted toward the total site area landscaping required in item.
J. Minimum Parking	Commercial – Parking requirements are subject to the Commercial Uses listed in Table 65-1, or as otherwise determined through a City approved shared parking analysis.
K. Minimum Design Standards	Pursuant to CHMC 16.05 – Objective Design Standards
(a) Minimum building separations for developments in the Fire Hazard District are subject to CHMC Chapter 16.22.030.B provisions and approval by Chino Valley Fire District and the Director.	

16.15.050 Permit approval required

A. A Site Plan approval is required for all projects in a Housing Priority Zoning District involving the construction of new or substantially remodeled buildings. A Site Plan approval is a Discretionary Permit and is subject to review and approval of the Planning Commission, pursuant to the provisions of CHMC Chapter 16.76.

B. Notwithstanding subsection (A) of this section, projects in a Housing Priority Zoning District involving the construction of new or substantially remodeled buildings, where at least two-thirds of the square footage of the overall development is designated for residential use, and where at least 20 percent of the residential units will be affordable to lower income households subject to Government Code Section 65583.2, are subject to a Housing Plan Approval. A Housing Plan Approval is a Non-Discretionary Permit and is subject to the review and approval of the City Manager as set forth in this chapter.

C. For all projects within a Housing Priority Zoning District, an application is required pursuant to the provisions of Section 16.58.020 of this Development Code. Once a Site Plan application or Housing Plan application is determined to be complete, the Director or designee shall review the application for conformance with the provisions of this Development Code and applicable General Plan provisions.

16.15.060 Housing Plan Approval

A. Applications for a Housing Plan Approval shall be submitted in the form and content as specified by the City of Chino Hills Community Development Department. Where applicable, the Housing Plan Approval application shall be accompanied by a required subdivision map as determined by the Director. Approval of any related subdivision map shall be subject to the requirements of Appendix D of this Development Code and the Subdivision Map Act.

B. Each Housing Plan Approval application shall set forth in text, maps, and diagrams the following, unless determined by the Director to be unnecessary for a particular project:

1. An existing setting description which includes:
    a) A topographic and surveyed map of the site in its existing condition,
    b) A list of all public and utility service providers, as well as a diagram of all public utilities and facilities on or adjacent to the site,
    c) The sizes and capacity of all existing public and/or private utilities on or adjacent to the site, including the sizes and dimensions of all public and/or private streets that provide access to the site, and
    d) A diagram illustrating the existing land use of adjacent properties within a 600-foot radius of the site;
2. The appropriate studies, prepared by a professional engineer or other qualified individual, that show the level of public services and facilities required to serve the proposed development; and the sufficiency of, or required improvements to, public services and facilities necessary to adequately serve the proposed development;
3. Proposed access and circulation, including parking areas, loading areas, and pedestrian walkways. The Housing Plan Approval application shall also detail any improvements to adjacent or off-site roadways required to serve the proposed development;
4. Significant natural features and areas to be retained for common open space, and provisions for preserving, maintaining, and using those areas;
5. Known manmade and natural hazards and the methods for mitigating the hazards;
6. Proposed grading, site development/improvements, and landscaping;
7. Plans showing all proposed structures, including the following:
    a) Footprints of all proposed buildings,
    b) Elevations for all sides of all buildings,
    c) Floor plans for all unit types,
    d) Materials and colors to be used on the exteriors of all proposed buildings, including color and material boards for buildings, and
    e) Colored rendering from each adjacent street or common area visible to the public;
8. Compliance with Objective Design Standards pursuant to CHMC Chapter 16.05.

9. Additional information listed in the Housing Plan Approval Application checklist, if any, issued by the Director and posted on the City's website.

C. Once an application for a Housing Plan Approval has been determined to be complete, the Director shall cause all application materials to be posted to the City's website and made available for public review.

D. The City shall review the application to approve, conditionally approve, or deny the project. The City, in acting to approve a Housing Plan Approval in a Housing Priority Zoning District, may impose conditions as are reasonably necessary to ensure the project is consistent with all applicable objective provisions of the Development Code and objective written policies, administrative regulations, procedures, standards and requirements approved by City Council, to avoid adverse impacts to the public health or safety, and to implement any previously-identified mitigation measures that are applicable to the project. The decision-maker shall approve the Housing Plan application if the following findings can be met:

1. The proposed development complies with all applicable, objective provisions of the General Plan;
2. The proposed development complies with all applicable development standards of the Housing Priority Zoning Districts;
3. The proposed development complies with the Objective Design Standards pursuant to Chapter 16.05;
4. The proposed development complies with all applicable, objective provisions of the CHMC;
5. The proposed development complies with all applicable, objective written policies, administrative regulations, procedures, standards and requirements adopted by the City Council; and
6. The proposed project complies with all applicable previously-identified mitigation measures in any environmental approval adopted under the California Environmental Quality Act for any applicable General Plan, Specific Plan or Planned Unit Development.

E. If a project that is the subject of a Housing Plan application otherwise meets the criteria set forth in subparagraph (D), the City may nevertheless disapprove the project or impose a condition that the project be developed at a lower density if the decision-maker makes written findings supported by a preponderance of the evidence on the record that both of the following conditions exist:

1. That the project would have a specific, adverse impact upon the public health or safety unless the project is disapproved or approved upon the condition that the project be developed at a lower density. For purposes of this paragraph, a "specific, adverse impact" means a significant, quantifiable, direct, and unavoidable impact, based on objective, identified written public health or safety standards, policies, or conditions as they existed on the date the application was deemed complete.
2. There is no feasible method to satisfactorily mitigate or avoid the adverse impact identified, other than the disapproval of the project or the approval of the project upon the condition that it be developed at a lower density.

F. Within 15 days of determining that an application for a housing development project with 150 or fewer housing units is complete, or within 30 days of determining that a housing development project containing more than 150 units is complete, the Director shall issue a Preliminary Decision and provide notice of same. Said Notice will include a brief description of the project; the Director's determination on the merits of the application made pursuant to this Section (i.e., whether the project will be approved, approved with conditions, or denied); and the date range during which any interested members of the public and the applicant may submit written comments for the City Manager's consideration prior to the issuance of a Final Decision. In addition, the Preliminary Decision shall include instructions on how to view the application materials on the City's website, which instructions may be in the form of a URL. If the Director's Preliminary Decision is to approve the project with conditions, the conditions of approval shall be fully set forth therein.

G. Upon issuance of the Preliminary Decision, a complete draft of the Preliminary Decision shall be posted to the City's website for viewing by any interested member of the public.

H. Notice of the Preliminary Decision shall be provided in accordance with the requirements of Section 16.58.040 of this Code.

I. For a housing development project with 150 or fewer housing units, any member of the public may submit written comments or correspondence to the City Manager within 15 days after notice of the Preliminary Decision is given pursuant to Section 16.58.040. Comments received from the public on such projects after the 15th day will not be considered; the applicant may submit written comments, including comments in response to public comments, within 20 days after notice of the Preliminary Decision is given. Alternatively, for a housing development project with more than 150 housing units, any member of the public may submit written comments or correspondence to the City Manager within 30 days after notice of the Preliminary Decision is given pursuant to Section 16.58.040. Comments received from the public on such projects after the 30th day will not be considered; the applicant may submit written comments, including comments in response to public comments, within 40 days after notice of the Preliminary Decision is given.

J. For a housing development project containing 150 or fewer housing units, the City Manager shall issue a written Final Decision on a Housing Plan application within 15 days after notice of the Preliminary Decision is given. Alternatively, for a housing development project containing more than 150 housing units, the City Manager shall issue a written Final Decision on a Housing Plan application within 30 days after notice of the Preliminary Decision is given. The City Manager may add or modify conditions of approval on the Final Decision. Additionally, the City Manager may change a decision to approve, approve with conditions, or deny a Housing Plan Approval between the Preliminary Decision and Final Decision. Prior to issuing the Final Decision, the City Manager shall obtain the City Attorney's approval as to form.

K. The Final Decision issued by the City Manager shall be the final administrative decision of the City. Notwithstanding section 1.02.010 and any other provision in this code, there is no right to appeal this decision administratively. An aggrieved party may seek judicial review.

L. Any Housing Plan Approval within a Housing Priority Zoning District that is not used within the time specified in the grant of approval or, if no time is specified, within three years of the effective date of such approval, expires at the end of that period. The Director may, for a Housing Plan Approval, extend such approval for a period of time not to exceed two years, provided an application requesting the extension is filed prior to the original expiration date. For purposes of this section "used" means the commencement of construction activity or any development activity authorized by the Housing Plan Approval.

M. The expiration date of a Housing Plan Approval that is approved concurrently (as part of the same project) with a Tentative Tract Map or Tentative Parcel Map shall be tied to the expiration date of the subject Tentative Tract Map or Tentative Parcel Map as set forth in Subsection 16.58.050(G).

N. An approved Housing Plan Approval, which is valid and in effect pursuant to the provisions of this Development Code, shall run with the land and shall continue to be valid upon change of ownership of the land or any lawfully existing building or structure on the land.

O. Policies, administrative regulations, procedures, standards and requirements adopted by City Council that are applicable to Housing Plans shall be posted upon the City's website.

Subsection C. of Section 16.58.020 (Application procedures) is amended to read as follows:

C. Acceptance of Applications by the Community Development Director as Complete. The Community Development Director or his or her designee shall accept applications made by those persons with standing to make such an application upon receipt of fees prescribed by resolution of the City Council. Pursuant to the California Government Code, Section 65943, no later than thirty (30) days after an application has been received for a development project as defined in Government Code, Section 65928, the Director shall determine whether the submitted application materials are complete and shall immediately transmit the determination to the applicant in writing.

1. If the application is determined to be incomplete, the Director shall provide the applicant with an exhaustive list of items that were not complete. That list shall be limited to those items actually required on

the City's submittal requirement checklist. In any subsequent review of the application determined to be incomplete, the City shall not request the applicant to provide any new information that was not stated in the initial list of items that were not complete. If the written determination is not made within 30 days after receipt of the application, and the application includes a statement that it is an application for a development permit, the application shall be deemed complete. Upon receipt of any resubmittal of the application, a new 30-day period shall begin, during which the Director shall determine the completeness of the application. If the application is determined not to be complete, the Director's determination shall specify those parts of the application which are incomplete and shall indicate the manner in which they can be made complete, including a list and thorough description of the specific information needed to complete the application. The applicant shall submit materials to the City in response to the list and description.

2. Not later than 30 calendar days after receipt of the submitted materials described in subdivision (1), the Director shall determine in writing whether the application as supplemented or amended by the submitted materials is complete and shall immediately transmit that determination to the applicant. In making this determination, the Director is limited to determining whether the application as supplemented or amended includes the information required by the list and a thorough description of the specific information needed to complete the application required by subdivision (a). If the written determination is not made within that 30-day period, the application together with the submitted materials shall be deemed complete.

3. If the application together with the submitted materials are determined not to be complete pursuant to subdivision (C)(2) above, the applicant may appeal that decision in writing to the Planning Commission. The Planning Commission shall issue its final written determination on the appeal not later than 60 calendar days after receipt of the applicant's written appeal. Notwithstanding section 1.02.010 and any other provision in this code, there is no right to appeal the Planning Commission's decision administratively. An aggrieved party may seek judicial review. Notwithstanding a decision pursuant to subdivision (C)(2) that the application and submitted materials are not complete, if the final written determination on the appeal is not made within that 60-day period, the application with the submitted materials shall be deemed complete.

4. Nothing in this section precludes an applicant and the Director from mutually agreeing to an extension of any time limit provided by this section.

Chapter 16.34 PARKING AND LOADING

16.34.010 Intent and purpose.

The purpose of the parking and loading regulations is to ensure that a II land uses provide adequate off-street parking facilities and adequate facilities for vehicle movement and loading activities associated with a use. The intent of these regulations is to ensure that the use of land does not negatively interfere with the use of and circulation on public rights-of-way, and that private on-site circulation does not pose a potential safety problem.

(Ord. No. 355, § 5(Exh. A), 3-24-2020)

16.34.020 Applicability.

A. The minimum standards of this chapter shall apply to all proposed land uses, buildings, and structures.

B. The minimum standards of this chapter shall also apply to all proposed additions, enhancements, and modifications to existing land uses or structures. At the time the building or structure is added onto, enlarged, or the use is intensified so as to cause a need for additional parking, parking and loading spaces shall be provided for both the existing units and the modified or enlarged portions so as to conform to provisions of this chapter, except as indicated in subsection C of this section.

C. Exemption for Existing Single-Family Homes. Structural additions or reconstruction project that is less than the fifty (50) percent of the square footage of the existing on-site buildings is not required to meet the parking requirement as indicated in Table 65-1, provided that the existing single-family home already provides two covered parking spaces.

(Ord. No. 355, § 5(Exh. A), 3-24-2020)

16.34.030 Site plan and building permit required.

A. A Site Plan shall be required for all required parking facilities. The plan shall consist of a detailed layout of the parking facility, site, and parking lot landscaping. The plan shall be accurately dimensioned, showing all required parking spaces, landscaped areas, driving a isles, ingress/egress points, etc. The Site Plan shall be submitted and reviewed in conjunction with any application for planning, land use, engineering, or building permit.

B. A parking facility or drive way shall have building and engineering permits for the facility or drive way in accordance with applicable provisions contained in the Municipal Code.

(Ord. No. 355, § 5(Exh. A), 3-24-2020)

16.34.040 Encroachment into right-of-way prohibited.

Land within the right-of-way of a proposed street or highway, or with in the planned ultimate right-of-way on a street or highway proposed to be widened, shall not be used to provide required parking and loading facilities.

(Ord. No. 355, § 5(Exh. A), 3-24-2020)

16.34.045 Clear corner areas at street intersections and driveways for sight visibility.

See Section 16.06.080 of this Code.

16.34.050 Location of parking and loading facilities.

A. Residential Uses.

1. Required parking facilities for residential zone districts shall be located on the same lot or parcel of land as the use the parking facilities are intended to serve, or within a single development as approved through the applicable entitlement permit granted pursuant to this Municipal Code that includes a requirement that a covenant, approved as to form by the City Attorney, shall be recorded describing the combined parking arrangement and granting reciprocal access rights to the parking facilities. The facilities shall be conveniently and safely located on the site. Required parking facilities provided by a given project shall be used exclusively for parking purposes by that projector residence, and shall not be leased, sold, or utilized by other projects or entities.

2. Per Section 16.34.080 of this chapter, parking on unpaved areas is prohibited in all zoning districts.

3. Within a required front yard area, vehicles may be parked only on a parking space as defined i n Section 16.34.080 of this chapter. Vehicles parked within a front yard area may not extend past the right-of-way line at the front of the lot or into an easement for side walk or access purposes.

4. Vehicles may be parked in a side or rear yard area, or within the buildable area of a lot on a parking space as defined in Section 16.34.080 of this chapter, provided that a minimum of three feet of clearance is provided between the vehicle and the adjacent outside wall of any structure containing windows.

B. Nonresidential Uses. Required parking for nonresidential uses shall be located:

1. On the same lot or parcel of land as the use which the facilities serve; or

2. On an adjoining lot or parcel of land under the same ownership as the lot supporting the use the parking facilities serve, provided that the adjoining lot is merged with the property containing the primary use for which the parking is required; or a covenant of easement is recorded for parking purposes in accordance with Section 16.34.090(A); or

3. On a lot or parcel of land separated only by an alley (twenty (20) feet wide or less) from the lot or parcel supporting the use the parking facilities serve; provided

    a. That such lots or parcels are under the same ownership;

    b. That such lots or parcels would be contiguous if not separated by the alley;

    c. That direct vehicular and pedestrian passage between such lots or parcels would be possible if the alley were vacated;

    d. That the parking and vehicular access on such lots or parcels can be designed to ensure safe pedestrian movement between the parking and the property containing the primary use it is intended to serve; and

    e. That a covenant of easement is recorded for parking purposes in accordance with Section 16.34.090(A).

(Ord. No. 355, § 5(Exh. A), 3-24-2020)

16.34.060 Number of parking spaces required.

A. Required Spaces.

1. Table 65-1 specifies the number of off-street parking spaces required for specific uses. The requirement for a use not specifically mentioned shall be the same as for a specified use which has the most similar traffic and/or parking-generating characteristics. The Community Development Director shall determine what constitutes similar traffic-generating characteristics.

2. As provided in Chapter 16.72 (Minor Variances) of this Code, the Director of Community Development may approve up to a thirty (30) percent reduction in the number of required parking spaces. Reductions of more than thirty (30) percent may be approved by the Planning Commission, as provided in Chapter 16.70 (Major Variances).

3. Evaluating parking for new uses within tenant spaces of existing shopping centers shall be calculated at the approved commercial center ratio. Notwithstanding the above, those uses that are identified in Appendix A of this Municipal Code as requiring a use permit may require, as part of its entitlement process, a shared parking study to determine appropriate parking ratios.

B. Fractional Spaces. If the calculation of required parking spaces results in a fractional number, that number shall be rounded up to the next whole number.

C. Total Spaces Required. Accessible and Electric Vehicle Parking spaces may count towards the total parking requirement listed below in Table 65-1 unless otherwise regulated by the California Building Code.

D. For the purposes of this section, parking ratios shall be calculated by total Gross Floor Area (GFA) as defined in Chapter 16.02, or noted otherwise below in Table 65-1.

Table 65-1.
Number of Automobile Parking Spaces Required

Use	Required Number of Spaces
Agricultural/Animal Keeping Uses	
Animal Shelter, Commercial Kennel, Farming/Orchard (Commercial), Horticulture Services	See General Retail
Commercial Uses	
Adult Business	See General Retail
Alcoholic Beverage on-site sales exclusive to persons over legal drinking age (no restaurant component)	See General Retail
Athletic, Fitness or Health Facility, and Live Entertainment 2,000 SF-GFA or less	1 space/100 SF-GFA
Athletic, Fitness or Health Facility, and Live Entertainment 2,000 SF-GFA or more	Subject to parking analysis under Minor Use Permit Pursuant to Appendix A
Automobile Accessory Sales	See General Retail
Automobile Dealer New and Used	1 space/2,000 SF-GLA
Automobile/Truck/Recreational Vehicle Rental—Onsite	1 space/350 SF-GFA, plus 1 space/2,000 SF of outdoor storage or if within existing shopping center, 1 space/per rental vehicle
Automotive Paint/Body/Repair Shop Automotive Tire sales/installation	1 space/250 SF-GFA of office space, plus 3 spaces for each service bay (service bays do not count as spaces)
Boarding House	1 space/per 2 beds
Car Wash	3 space/1,000 SF-GFA
General Retail	1 space/250 SF-GFA

General Retail as part of Shopping Center	1 space/250 SF-GFA, with a minimum of 4 spaces If restaurant space occupies more than 10% of total GFA, the parking for the additional restaurant space beyond the 10% shall be calculated at the restaurant rate.
Home Improvement Center	1 space/250 SF-GFA for indoor sales, plus l space/1,000 SF gross outdoor retail area
Hotels and Motels	1 space/guest room, plus additional spaces for restaurant and public assembly areas as required for those uses
Micro-Brewery/Distillery/Winery	Subject to a parking analysis under Minor Use Permit or Conditional Use Permit Pursuant to Appendix A
Nurseries Retail	1 space/1,000 SF indoor GFA, plus l space/2,000 SF gross outdoor retail area
Residential Sales Office (Temporary)	3 spaces per model home or unit, including at least 1 space designated for vehicles displaying a disabled placard
Temporary Sales (Christmas Tree/Pumpkins)	1 space per each 500 SF of tree/pumpkin display area. Minimum number of spaces is subject to review and approval by the City; at least one space must be designated for vehicles displaying a disabled placard.
Tutoring/Music Instruction 2,000 SF-GFA or less	1 space/200 SF-GFA
Tutoring/Music Instruction 2,001 SF-GFA or more	Subject to parking analysis under Minor Use Permit pursuant to Appendix A
Industrial and Manufacturing Uses	
General Manufacturing, Breweries/Distilleries/Wineries, Recycling Facility Commercial more than 500 SF-GFA (not including buildings used exclusively for warehouse purposes)	1 space/500 SF-GFA of industrial/manufacturing area, plus 1 space/300 SF-GFA of office use, plus 1 space/1,000 SF-GFA of warehouse area
Self-Storage	1 space/2,500 SF-GFA of warehouse area, plus additional spaces as required for any associated residential/office uses
Warehouses	1 space/1,000 SF-GFA of warehouse area, plus 1 space/300 SF of office use
Institutional and Assembly Uses	
Auditoriums, Places of Public Assembly and Religious Institutions	1 space/3 fixed seats(or 54" of bench seating), or 1 space/25 SF-GFA of assembly area where there are no fixed seats
Professional School	1 space/200 SF-GFA
School/Education Institution K-12 grades	1.5 spaces/classroom, plus l space/5 fixed seats in auditorium, gymnasium or similar public assembly facility, or 1 space/35 SF-GFA of assembly area where there are no fixed seats
Medical Uses	
Hospitals	1 space/2 patient beds, plus l space for each employee and staff member
Medical Clinic/Urgent Care	1 space/200 SF-GFA
Medical Laboratories	1 space/300 SF-GFA
Veterinary Hospital	1 space/250 SF-GFA

Office Uses	
General Office	1 space/250 SF-GFA
Medical Offices	1 space/200 SF-GFA, with a minimum of 4 spaces
Recreation and Entertainment Uses	
Entertainment Center (Indoor)	Subject to parking analysis under Conditional Use Permit Pursuant to Appendix A
Entertainment Center (Outdoor)	Subject to parking analysis under Conditional Use Permit Pursuant to Appendix A
Game Courts (Commercial Venture)	Subject to parking analysis under Minor Use Permit Pursuant to Appendix A
Golf Course	Subject to parking analysis under Conditional Use Permit Pursuant to Appendix A
Swimming Pool or similar recreation water facility (Commercial Venture)	Subject to parking analysis under Minor Use Permit Pursuant to Appendix A
Residential Uses	
Apartments in the RM-1, RM-2, and RM-3 zoning districts	2 spaces per unit, with one space required to be covered, plus one guest for every 2 dwelling units, plus the following: 3 spaces for each on-site rental or sales office for developments of 100 units or less, plus l additional space for each additional l00 units or fraction thereof, plus 2 additional spaces dedicated for post office delivery and mail pick-up by residents
Duplex, multifamily condominiums, town houses, and similar developments in the RM-1, RM-2, RM-3 and MDH zoning districts	2-car garage or carport for each unit, plus one guest space for every 2 dwelling units, plus the following: 3 spaces for each on-site rental or sales office for developments of 100 units or less, plus l additional space for each additional l00 units or fraction thereof, plus 2 additional spaces dedicated for post office delivery and mail pick-up by residents
Dwelling units in the UHDH, VHDH, and MUH zones	See Chapter 16.15
Mobilehome Park	2 spaces per unit, plus one guest space per every 2 units, plus 2 spaces for each on-site sales or rental office
Single-family Dwelling Unit in RA, RR, RS, and MU zoning districts	Up to 3,100 SF[1] —4 spaces (2 must be in a garage[2]) 3,101—6,000 SF[1] —5 spaces (3 must be in a garage[2]) 6,001 and above—6 spaces (4 must be in a garage[2]) Note: 1. The square footage excludes the garage space 2. Unless existing as a carport
Restaurants	
Outdoor Dining Areas for restaurants	1 space per 150 SF of outdoor seating area
Restaurants, as defined in Chapter 16.02 of this Code	1 space/75 SF-GFA of serving area, plus 1 space/200 SF-GFA of kitchen area Restaurants with drive-through areas must provide at least 6 on-site queuing spaces for patron vehicles ahead of the menu board; or subject to a queuing

	analysis under a Conditional Use Permit pursuant to Appendix A
Supportive Uses	
Assisted Living/Nursing Facility	1 space for every 4 beds, plus parking for on-site employee housing
Day Care Facility, Commercial	1 space per employee, plus l space/10 children
Emergency Shelter	1 space/per 4 beds
Abbreviations: SF = square feet, GFA = gross floor area, GLA = gross land area	

E. Accessible Parking Spaces. Parking for disabled persons shall be provided pursuant to the provisions of Title 24 of the California Code of Regulations.

F. Compact Parking. Compact parking spaces are not permitted. However, such spaces existing on December 14, 1995 may continue to exist as a legal non-conforming use. Parking lots which contain compact spaces as of December 14,1995 which are restriped to eliminate compact spaces will not be subject to the parking requirements of this chapter, if the elimination of compact spaces results in a deficit of parking (as calculated using the standards in this chapter).

G. Bicycle Parking. Bicycle parking spaces shall comply with the currently adopted California Building Code.

H. Electric Vehicle Parking Spaces (EV parking spaces). EV parking spaces shall meet the minimum parking stall dimension as indicated in Figure 65-1 of this code, and shall comply with the currently adopted California Building Code.

(Ord. No. 355, § 5(Exh. A), 3-24-2020)

16.34.070 Parking facility layout and dimensions.

Parking facilities shall be designed to conform to the following minimum standards:

A. Access.

1. Off-Street Parking. Fully accessible, adequate and safe ingress and egress shall be provided from and to a street, highway, alley, or driveway, as required by the City.

2. On-Street Parking. On-street parking for public roads shall comply with Title 12 of the Chino Hills Municipal Code (Streets, Sidewalks and Public places standards) and Chapter 8.16 of the Chino Hills Municipal Code (adopting by reference the California Fire Code) standards. On-street parking for private roads shall adhere to City Engineering standards, unless otherwise modified subject to Fire District concurrence and the applicable entitlement permit pursuant to this Municipal Code.

B. Parking Space Dimensions. The minimum size of a non-cove red parking space shall be nine feet wide and nineteen (19) feet long. A 2-foot overhang may count towards the minimum length of nineteen (19) feet provided the overhang does not encroach into a minimum five-foot clear walkway (reference Figure 65-1).The minimum interior clear space for a one-car garage space is ten (10) feet wide by twenty(20) feet long(by example, a two-car garage would be required to be at least twenty (20) feet wide by twenty (20) feet long), free and clear of washer and dryer, water heater, etc. The minimum size of an accessible parking space shall be as directed by Title 24 of the California Code of Regulations.

C. Parking Access. Access leading to parking facilities, including garages for private residences, shall meet the following dimensions:

Single-Family Residential and Duplex:

1. Minimum Residential Driveway Width. The minimum width shall be nineteen (19) feet or equal to the width of the main garage door, whichever is less. For garages located outside the front yard of a property, the driveway leading to the garage shall be a minimum width of twelve (12) feet, provided the width directly in front of the garage is equal to or greater than the main garage door.
2. Minimum Residential Driveway Length. Driveways for single-family or duplex units in any zoning district shall be a minimum of nineteen (19) feet in length.
3. Limit on Residential Driveways. The number of permitted driveways shall be one for a lot with a frontage of fifty (50) feet or less; two driveways are permissible for lots with a frontage greater than fifty (50) feet, provided the re is a minimum separation often (10) feet between the driveways. A curved driveway with two entrances shall count as one driveway and shall have a minimum separation often (10) feet between drive entrances.
4. Shared Driveway. Shared driveways for adjoining residential lots shall be a minimum width of nineteen (19) feet, and subject to Zoning Clearance pursuant to Section 16.79 procedures.

Non-Residential and Multi-Family:

1. Maneuvering Areas. Access facilities shall be arranged so that any vehicle can leave the parking area and enter into an adjoining vehicular right-of-way traveling in a forward direction.
2. The minimum width is twenty-six (26) feet fortwo-way traffic, however, primary drive aisles shall be thirty (30) feet wide. Greater widths may be required at the discretion of the City. Pavement graphics and directional signs and arrows shall be provided.

D. Interior Parking Lot Dimensions. The minimum dimensions and layout of interior circulation drive aisles and other maneuvering areas shall be adequate to provide for safe vehicular movements and to avoid conflicts with pedestrian, subject to the review and approval of the City Traffic Engineer.

(Ord. No. 355, § 5(Exh. A), 3-24-2020)

16.34.080 Parking facility development standards.

A. Paving Required.

1. All parking spaces and associated driveways shall be entirely paved with concrete or asphalt-type surfacing as per City standards and requirements.
2. All newly constructed driveways and parking areas shall be concrete, asphalt, or as otherwise approved by the City.
3. Parking on areas which do not meet the above standards shall be prohibited.

B. Parking Space Delineation.

1. Each parking space shall be clearly marked and maintained with paint or another easily distinguishable material.

C. Construction.

1. All driveways and parking areas shall be constructed and striped in accordance with road and drainage standards established by the City and the Fire District.
2. Curbs shall be used in conjunction with landscaped areas, as approved by the City.

3. A six-inch concrete step-out shall be provided along the curb (for an aggregate of twelve (12) inches of paved surface) where landscaping is adjacent to parking spaces.

D. Lighting. Outdoor parking areas, in all zones other than single-family residential zones, shall be designed and maintained with a lighting system providing an illumination level of one foot-candle throughout the parking area, while preventing glare or direct illumination from intruding into any areas outside the parking lot.

E. Landscaping and Screening. Parking lot landscaping shall be provided and maintained as required in this Development Code.

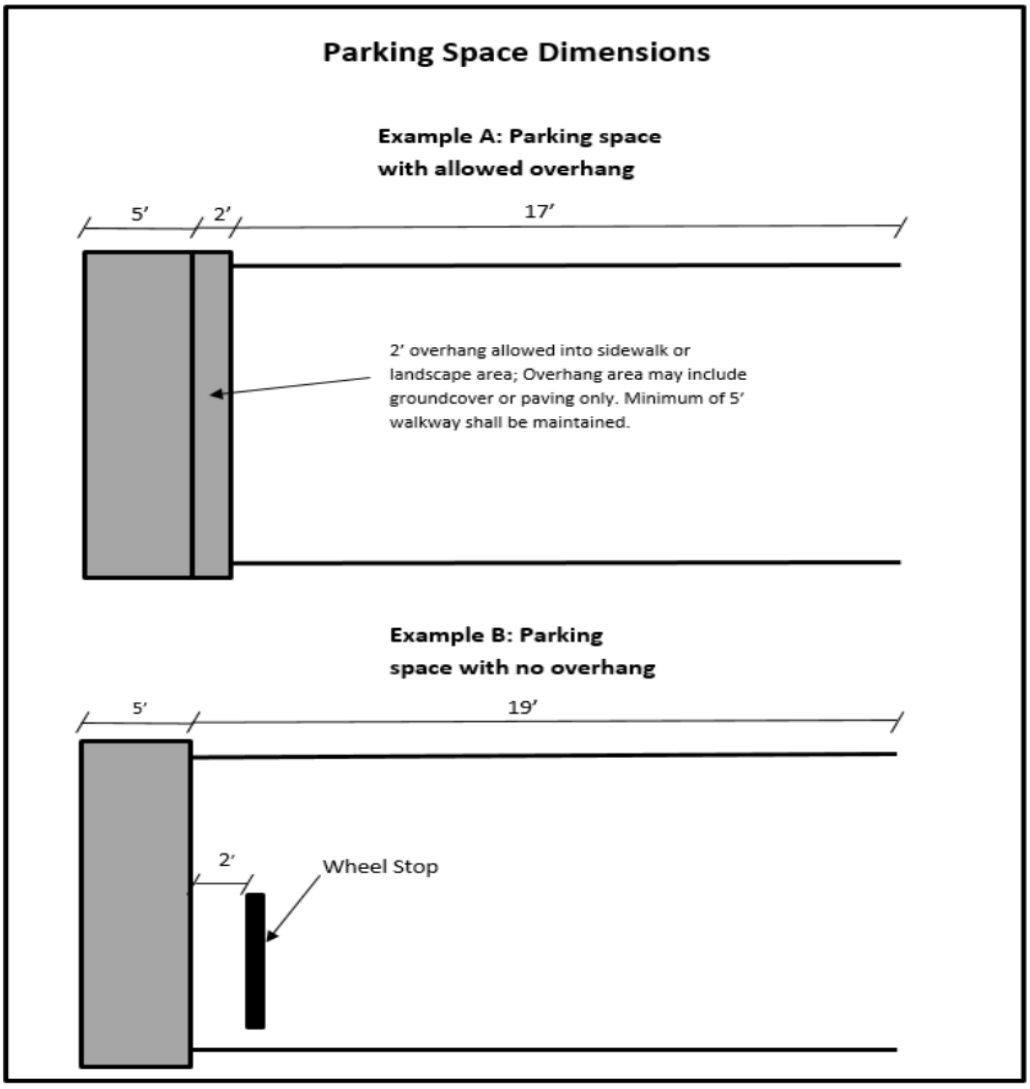


Figure 65-1

(Ord. No. 355, § 5(Exh. A), 3-24-2020)

16.34.090 Combined or shared parking facilities.

A. For Uses on Separate Lots or Parcels. Required parking facilities for nonresidential uses may be provided collectively for two or more buildings or uses located on the same or separate contiguous lots or parcels of

land, provided that the total combined parking facilities meet or exceed all other minimum parking capacity requirements for the buildings or uses. A covenant, approved as to form by the City Attorney, shall be recorded describing the combined parking arrangement and granting reciprocal access rights to the parking facilities.

B. Shared Parking For Separate Uses Within the Same Development. Where two or more uses are located on the same parcel, the applicant may propose the use of shared parking, provided that a shared parking analysis is approved by the City, demonstrating that sufficient parking will be provided at all times for all uses. Such shared parking analysis shall be prepared pursuant to guidelines published by the Urban Land Institute or other guidelines as approved by the City. Where separate parcels exist within a single development, a parking agreement shall be required, per subsection A of this section.

(Ord. No. 355, § 5(Exh. A), 3-24-2020)

16.34.100 Loading space requirements.

A. Number of Spaces Required. Required loading spaces will be determined on a case-by-case basis, depending on the requirements of each project.

B. Dimensions. The dimensions of loading spaces will be determined on a case-by-case basis, depending on the requirements of each project (including the length of trucks to be served and the configuration of buildings on the site).

C. Location. All loading areas shall be located outside of any required aisles or other circulation areas. Adequate turning radii shall be provided to allow a vehicle to maneuver without backing into a street or without backing into the loading space from the street.

(Ord. No. 355, § 5(Exh. A), 3-24-2020)

16.34.110 Religious institution affiliated housing development projects; parking requirements.

A. Notwithstanding any provisions of this title or any adopted specific plan to the contrary, the parking requirements for a religious institution affiliated housing development project are subject to the provisions of Government Code section 65913.6, as amended.

B. "Religious institution affiliated housing development project" is defined as a housing development project that meets all of the following requirements:

   a. The housing development project is located on one (1) or more contiguous parcels that are each owned, entirely, whether directly or through a wholly owned company or corporation, by a religious institution.

   b. The housing development project qualifies as being near collocated religious-use parking by being on or adjacent to a parcel with religious-use parking or by being located within one-tenth of a mile of a parcel that contains religious-use parking.

   c. Qualifies for a density bonus under Government Code section 65915.

C. Allows up to fifty (50) percent elimination of total religious-use parking spaces available for a religious institution affiliated housing development project.

D. No replacement requirement of religious-use parking spaces for a religious institution affiliated housing development project proposes to eliminate, provided the reduction does not exceed fifty (50) percent.

E. Allows the remaining religious-use parking spaces to count toward number of parking spaces required for the religious institution affiliated housing development project.

F. Prohibits the reduction in parking spaces from reducing the minimum parking standards below one (1) space per unit unless the religious institution affiliated housing development project is within one-half (½) mile of a high-quality transit corridor or a major transit stop, or a car share vehicle within one (1) block of parcel.

   a. High-quality transit corridor means a corridor with fixed route bus service with service intervals no longer than fifteen (15) minutes during peak commute hours.

   b. Major transit stop includes existing rail or bus rapid transit station, ferry terminal served by either bus or rail transit service, or the intersection of two (2) or more major bus routes with a frequency of service interval of fifteen (15) minutes or less during the morning and afternoon peak commute periods.

   c. Car sharing means a model of vehicle rental where users can rent vehicles for short periods of time and users are members that have been preapproved to drive.

(Ord. No. 366, § 6(Exh. A), 5-11-2021)

Chapter 16.58 ADMINISTRATIVE PROCEDURES

16.58.010 General procedures.

A. Introduction. This chapter establishes the regulations for the effective and efficient implementation of Title 16 of the Chino Hills Municipal Code (or Development Code). This chapter contains the procedures for discretionary review of development applications, criteria for acceptance of applications for discretionary actions, standards for processing of applications, and requirements for the notice and conduct of public hearings. The provisions of this chapter, used in combination with the provisions of the Development Code, provide for a system of development review that is open to the public and responsive to the needs of the community.

B. Types of Review Procedures in Effect in Chino Hills. Table 100-1 outlines the types of review procedures in effect in Chino Hills.

C. Authorized Decision-Makers. The following are authorized to make decisions pursuant to Title 16 of the Municipal Code as follows:

1. City Council. The City Council shall be responsible for the decisions listed in Table 100-1.

2. Planning Commission. The Planning Commission shall be responsible for the decisions listed in Table 100-1.

3. Community Development Director. The Community Development Director shall be responsible for the decisions listed in Table 100-1.

Exhibit "B"
Table 100-1

Type of Action		Community Development Director:			Planning Commission:			City Council:	
	Action Taken to PRC for Advisement Only	Authority to Approve or Deny	Public Hearing Required	Advisory to Planning Commission Only	Authority to Approve or Deny	Advisory to City Council Only	Public Hearing Required	Authority to Approve or Deny	Public Hearing Required
Tentative Tract/Parcel Maps	■			■	■		■		
Final Subdivision Map for Recordation								■	

(Note: Final Maps are processed through the Community Development Department)									
Reversion to Acreage						■		■	■
Lot Line Adjustments (Note: Lot Line Adjustments are processed through the Engineering Department)		■							
Lot or Parcel Merger (Note: Lot or Parcel Mergers are processed through the Engineering Department)		■							
Extension of Time for Tentative Maps, Site Plan Reviews, and Conditional	■			■	■		■		

Use Permits (Note: The decision-making body with authority over an extension request is the same body which initially approved the map)									
Certificate of Land Use Compliance		■							
Minor Variance		■							
Major Variance	■			■	■		■		
Minor Exception		■							
Minor Use Permit		■	■						
Planned Developments: Preliminary Development Plan	■		■		■	■	■	■	
Planned Developments: Final	■		■	■		■			

Development Plan									
Zoning Clearance		■							
Equestrian and Large Animal Business Permit/Use Permit		■	■						
Conditional Use Permit	■			■	■		■		
Housing Plan Approval		■							
Site Plan Approval	■			■	■		■		
Temporary Use Permit		■							
Development Code Amendment/ Change of Zone	■			■		■	■	■	■
Specific Plans and Specific Plan Amend-ments	■			■		■	■	■	■
General Plan Amend-ments	■			■		■	■	■	■
CEQA: Negative		CEQA documents are approved/certified by the decision-making body having the authority on the proposed project, as defined in this section.							

Declarations and EIRs									
Residential Design Review				■	■				
Agricultural Preserves and Amend-ments	■			■		■	■	■	■

Notes:

* All land use decisions which require a legislative act as part of any portion of the land use decision prior to their approval or denial shall be automatically referred to the City Council as a whole for final action following a recommendation from the decision-making body with discretionary authority over the non-legislative actions(s).

* The function of the Project Review Committee (PRC) is limited to providing advice to the Community Development Director. PRC members will typically suggest proposed conditions of approval; the PRC does not have approval authority for any type of application.

* All decisions of the Community Development Director may be appealed to the Planning Commission, except for decisions on Housing Plan Approvals.

* All decisions of the Planning Commission may be appealed to the City Council.

* The function of the Project Review Committee (PRC) is limited to providing advice to the Community Development Director. PRC members will typically suggest proposed conditions of approval; the PRC does not have approval authority for any type of application.

16.58.060 Appeals.

A. Authority to Appeal.

1. All actions and decisions of the Community Development Director authorized by this Development Code may be appealed to the Planning Commission. All such appeals shall be filed with the Planning Commission secretary.

2. All actions of the Planning Commission authorized by this Development Code may be appealed to the City Council. All appeals shall be filed in writing with the City Clerk.

3. Any person may appeal a decision of Director of Community Development or Planning Commission in accordance with the terms of this chapter.

4. The City Council shall be the final approval authority for all actions. Applications which are denied by the City Council are not subject to appeal, but may be resubmitted pursuant to Section 16.58.050, above.

B. Time Limit for an Appeal Filing. All appeals must be brought within ten (10) working days of the date of the final action by the Director of Community Development or Planning Commission.

C. Fees. Persons filing appeals shall pay all applicable fees in effect at the time of the appeal as established by resolution of the City Council.

D. The provisions of this section shall not apply to Housing Plan Approvals, which are governed by the provisions of Chapter 16.15 of this Code.

(Ord. 68 § 9.100.060, 1995)

Landscape Elements

To achieve a cohesive appearance and compatibility of a new project with its surroundings, landscape elements must meet the following standards.

Design Standards	Yes	No	N/A
A. Proposed projects shall include at least three of the following landscape elements in the landscape plan: a. Pedestrian-scaled lighting (bollards and/or landscape lighting) b. Fountains c. Decorative paving d. Landmark tree (48-inch box minimum) e. Seating opportunities such as raised planters and walls. f. Shade structures such as free-standing trellises and canopies.			
B. Landscaping shall contain a combination of low (3 – 24 inches), medium (2 – 5 feet) and tall (5 + feet) plant materials. For example, low planting may be used in the foreground, proceeding back to the tallest in the background. See Figure 8.			
C. In townhouse or rowhouse type projects, trees and/or planting of at least six square feet shall be provided adjacent to garage doors facing alleys and motor court drives to soften the appearance of the building.			
D. A minimum of five-foot-wide landscaping shall be incorporated around the base of buildings (except for walkways and driveways) to soften the edge between parking, drive aisles, and sidewalks.			
E. Projects shall provide required open space consistent with Chapter 16.08 of the Development Code.			
F. Projects shall provide landscape coverage consistent with Chapters 16.10 or 16.15 of the Development Code, dependent on the zoning designation of the site.			

Deleted: (3)

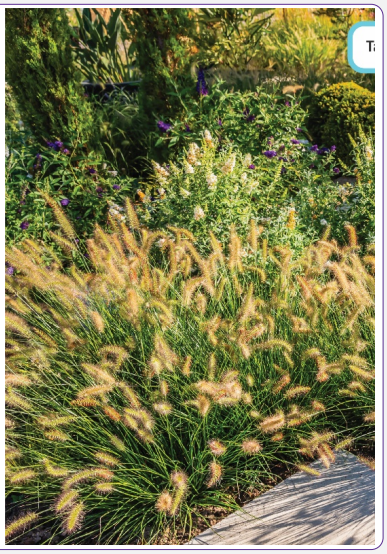
Deleted: (6)

Deleted: (5)

Figure 8 Landscape Elements



Deleted:



8 Utility and Service Areas

Deleted: ¶

Utility and service area standards are in place to minimize visual clutter and maintain efficient service areas.

Refuse and Recycling Material Storage Areas

Refuse and recycling material storage areas must meet the following standards.

Design Standards	Yes	No	N/A
A. Refuse and recycling material containers shared by multiple dwelling units shall be enclosed and screened in accordance with Section 16.10.060 of the Development Code. Sizing of the enclosures shall conform to the requirements of the City's Franchise Waste Hauler.			
B. Refuse enclosures shall incorporate roof structures to help improve stormwater quality in accordance with the National Pollutant Discharge Elimination System (NPDES) requirements and to screen the enclosure from views from above.			

C.	Refuse enclosures shall be finished using materials and colors that are consistent with the buildings architectural style. Enclosure gates shall be opaque.		
D.	Detached refuse enclosures shall not be closer than 20 feet from doors or operable windows of adjacent structures.		
E.	Refuse and recycling material containers stored within individual yards shall be screened from street view and from view of adjacent residential portions of the project.		
F.	Loading areas and refuse storage facilities shall be as far as possible from residential units and shall be completely screened from view of adjacent residential portions of the project. The location and design of trash enclosures shall account for potential nuisances from odor.		

Deleted: twenty (

Deleted:)

Loading and Service Areas

Loading and service areas must meet the following standards.

Design Standards	Yes	No	N/A
A. Loading docks and service areas meet the requirements of Chapter 16.34.050 of the Development Code.			
B. One loading space is required in any parking lot with 15 or more spaces serving any nonresidential or mixed use.			

Deleted: fifteen (

Deleted:)

Mechanical and Utility Equipment

Mechanical and utility equipment must meet the following standards.

Design Standards	Yes	No	N/A
A. Mechanical devices such as exhaust fans, vents, and pipes shall be painted to match or complement the adjacent surfaces. Mechanical equipment such as HVAC systems shall be screened from view with landscaping, walls, or a material that complements the building. The materials used for screening shall be painted to match or complement the adjacent surfaces.			
B. With the exception of photovoltaic and solar hot water systems, mechanical and utility equipment shall be screened from view in accordance with Section 16.10.050 of the Development Code and to the extent permitted by the utility and/or service provider. This requirement applies to equipment located on the roof, on the side of a building, and on the ground. The method of screening shall be architecturally integrated with the building design or landscaping.			
C. All electrical utility equipment, electrical meters, and junction boxes shall be placed within a utility room. If a utility room is not feasible, then all utility equipment shall be purposefully designed as an integral part of the building development, placed adjacent to alleyways, within parking areas, or within rear or side yards, and screened from public view.			

Mailboxes

Commented [MH16]: Include requirement for trash receptacles in all mailbox areas.

Commented [SH17R16]: added

Mailboxes must meet the following standards.

Design Standards	Yes	No	N/A
A. Cluster mailboxes shall be located in enclosure or under a shelter that provides weather protection. See Figure 9.			
B. Cluster mailbox enclosures shall be located to allow for convenient, short-term parking for the mail carriers.			
C. Common mailbox enclosures shall be designed using the same materials and colors as the surrounding residential buildings.			
D. To maintain cleanliness and promote responsible waste disposal, all buildings must provide a trash receptacle in each mailbox area. The trash receptacle must be placed within 5 feet of the mailbox area and must be easily accessible and visible to all users of the mailbox area.			

Figure 9 Cluster Mailboxes



APPENDIX F: SHOPPES SPECIFIC PLAN 04-01 AMENDMENT NO. 6

APPENDIX G: PROPOSED GENERAL PLAN GOALS, POLICIES, AND ACTIONS

SUMMARY OF REVISED GOALS, POLICES AND ACTIONS

All new language is provided in **bold/underline** and deleted language is provide with ~~strikeout~~.

CIRCULATION ELEMENT

The following goals, policies, and actions support the City of Chino Hills Circulation Plan and the City's vision to provide well-planned transportation and utility systems that support the general pattern of development.

Goal C-1: Provide a Comprehensive Vehicular Transportation Network

Policy C-1.1: Provide a comprehensive roadway network that supports the movement of people and goods in a safe and efficient manner.

Action C-1.1.1: Achieve and maintain a minimum Level of Service D on all roadway links and at all roadway intersections, with the exception of intersections within one-half mile of the SR-71 Freeway, where a minimum Level of Service E shall be maintained.

Action C-1.1.2: Maintain San Bernardino County Congestion Management Program (CMP) highway system roadway links and intersections at Level of Service E.

Action C-1.1.3: Require traffic impact analyses or traffic studies for private and public projects, applying LOS criteria, to ensure that discretionary development projects do not cause roadway congestion in excess of acceptable levels of service within Chino Hills, or on CMP roadway links or intersections.

Action C-1.1.4: Require new developments to provide for all roads within their boundaries and to pay their fair share of planned roadway improvement costs.

Action C-1.1.5: Continue to assert that all improvements to and maintenance of the portion of Chino Hills Parkway/ Carbon Canyon Road that is part of SR-142 shall be the responsibility of the State of California.

Action C-1.1.6: Continue to enforce heavy truck travel restrictions throughout the City.

Policy C-1.2: Create a safe, efficient, and neighborhood-friendly street system.

Action C-1.2.1: Minimize through traffic in residential neighborhoods through a variety of land use controls and traffic control devices.

Action C-1.2.2: Construct major streets on the perimeter of the neighborhood to improve public safety by eliminating hazards, noise, smoke, odor, and other nuisances from residential areas.

Action C-1.2.3: Design collector streets to circulate traffic within the neighborhood but discourage through traffic.

Action C-1.2.4: Design local streets to primarily provide access to homes and other properties.

Action C-1.2.5: Require all development projects to meet mandatory standards with regard to vertical and horizontal alignments, access control, rights of way, cross-sections, intersections, sidewalks, curbs and gutters, cul de sacs, driveway widths and grades, right of way dedication and improvements, and curb cuts for the disabled.

~~Action C-1.2.6: Retain the switchbacks on Carbon Canyon Road between Feldspar Drive and the Western Hills Country Club~~.

Action C-1.2.**6**~~7~~: Provide adequate sight distances for safe vehicular movement at a road's design speed and at all intersections as consistent with City and Caltrans standards.

Action C-1.2.**7**~~8~~: Prohibit direct driveway access from individual residences to ~~major~~ arterials~~, major highways, secondary highways~~, and collectors.

Action C-1.2.**8**~~9~~: Require driveway placement to be primarily designed for safety and, secondarily, to enhance circulation.

Action C-1.2.**9**~~10~~: Plan access and circulation of each development project to accommodate vehicles (including emergency vehicles and trash trucks), pedestrians, and bicycles.

Action C-1.2.**10**~~11~~: Require adequate off-street parking for all developments.

Goal C-2: Support Regional Transportation Policies That Link Chino Hills to Neighboring Cities and Counties

Policy C-2.1: Support and participate in regional efforts to improve vehicular and non-vehicular transportation systems.

Action C-2.1.1: Support and cooperate with all aspects of the countywide CMP for maintaining levels of service for CMP segments located in the City.

Action C-2.1.2: Coordinate with San Bernardino Associated Governments (SANBAG) regarding the integration of Intelligent Transportation Systems (ITS) that will maximize

the efficiency of the transportation system through advanced technologies, such as adaptive signal controls.

Action C-2.1.3: Collaborate with regional transportation planning and transit agencies to plan for the efficient allocation of transportation resources.

Action C-2.1.4: Support regional efforts to the extent feasible to reduce single-occupancy vehicle travel.

Action C-2.1.5: Continue to implement the citywide trip reduction ordinance, consistent with San Bernardino County CMP requirements, to reduce traffic congestion and improve air quality.

Action C-2.1.6: Continue to implement Vehicle Miles Traveled (VMT) City policy and guidelines to ensure consistency with State Office of Planning and Research Green House Gas reduction efforts.

Goal C-3: Provide Safe and Adequate Pedestrian, Bicycle, and Public Transportation Systems to Provide Alternatives to Single Occupant Vehicular Travel and to Support Land Uses

Policy C-3.1: Encourage the use of public transportation for commute and local, and increase citywide transit ridership.

Action C-3.1.1: Work with OmniTrans and/or other **transit** ~~bus~~ providers to **maintain and** expand transit routes serving the City and the surrounding communities.

Action C-3.1.2: Work with OmniTrans and/or other bus providers to assess and provide paratransit services for low-income, elderly, disabled, and other residents in need of access assistance.

Action C-3.1.3: Work to ensure that all transit stops have as many amenities as feasible such as: shade structures, water fountains, wayfinding, live route information, and bicycle parking.

Action C-3.1.4: Partner with transit agencies to continue and further develop a free or reduced fare program, and other transportation modes such as dial-a-ride, for youth, seniors, disabled, and other vulnerable populations.

Action C-3.1.5: Make available to the public maps that show mobility routes for walking, biking and transit, as well as, how these networks connect to schools, parks, healthy food, and transit.

~~Action C-3.1.3: Require bus turn-outs in residential, commercial, and industrial public use areas.~~

~~Action C-3.1.4: Plan for a transit station within walking distance (as determined by state and regional policy) of Grand Avenue and Peyton Drive.~~

Policy C-3.2: Support other alternatives to single-occupant vehicular travel.

Action C-3.2.1: Work with the Chino Valley Unified School District to implement ride sharing, bike routes, and other non-single-occupant vehicle transportation options.

Action C-3.2.2: Establish one or more park-and-ride lots to be located near freeway interchanges, and require secure and easily accessible park-and-ride facilities.

Action C-3.2.3: Support the citywide Bicycle Master Plan and bikeway improvements.

Action C-3.2.4~~1~~: Add bike lanes, sidewalks, and crosswalk improvements to close gaps in walking and biking networks and improve safe mobility across the City with a focus on areas around schools and public facilities.

Goal C-4: Encourage Development That Supports Balanced Land Uses and Alternative Modes of Transportation That Reduce the Reliance on the Automobile

Policy C-4.1: Plan for high-density mixed-use development close to arterial roadways and available transit.

Action C-4.1.1: Locate high density housing within walking distance of transit, as determined by state and regional policies.

Action C-4.1.2: Locate high density housing within walking distance of shopping, services and transit.

Action C-4.1.3: Prioritize transportation investments to increase safety around parks, open spaces, community centers, major shopping centers, schools, preschools, and childcare centers.

Action C-4.1.4 Require mixed use and/or high-density development to incorporate pedestrian-oriented design elements, such as accessibility to adjacent shopping, services and transit; safe pedestrian connections and crossings; parks and public open spaces; street furniture, attractive pedestrian-oriented design at the street level; street facing buildings; and street trees and landscaping.

Action C-4.1.5: Encourage use of alternative fuel vehicles and the construction of infrastructure to charge/fuel alternative fuel vehicles.

Action C-4.1.6: Require EV chargers in new public and private developments, including new multifamily developments.

Goal C-5: Ensure an Adequate and Well-Maintained Infrastructure System

Policy C-5.1: Provide adequate infrastructure improvements in conjunction with development.

Action C-5.1.1: Plan and design new roadways and expansion/completion of existing roadways to allow for co-location of water, sewer, storm drainage, communications, and energy facilities within the road right of way.

Action C-5.1.2: Require private and public development projects to be responsible for providing road improvements along all frontages abutting a public street right of way in accordance with the design specifications for that roadway.

Action C-5.1.3: Require private and public development projects to be responsible for providing traffic control devices and wet and dry utility improvements necessary to meet the needs of the project, and to properly integrate into the established and planned infrastructure systems.

CONSERVATION ELEMENT

The following goals, policies, and actions support the City of Chino Hills Conservation Plan and its vision to preserve natural resources, promote energy conservation, and protect cultural resources.

Goal CN-1: Preserve Chino Hills' Rural Character

Policy CN-1.1: Preserve and protect Chino Hills' rural and natural scenic qualities

Action CN-1.1.1: **Protecting ridgelines as** ~~Protect~~ identified **under Land Use Element Goal LU-1, Policy LU-1.1, Action LU-1.1.2.** ~~extremely prominent ridgelines, prominent ridgelines, and knolls.~~

Action CN-1.1.2: Preserve the character of natural open spaces **as identified under Land Use Element Goal LU-1, Policy LU-1.1, Action LU-1.1.3 and Action LU-1.1.12**~~by integrating existing natural features into new development.~~

Action CN-1.1.3: Preserve as much open space as possible along canyon roadways such as Carbon Canyon, Soquel Canyon, and the canyons adjacent to Chino Hills State Park.

Action CN-1.1.4: Keep canyon floors ~~as close~~ as close as possible to their natural condition to accommodate natural periodic flooding, wildlife habitat, and native riparian plants.

~~Action CN-1.1.5: In canyon areas committed to development, emphasize the retention of natural topographic features, and require low visual profiles and dense vegetation for buildings.~~

Action CN-1.1.6: Encourage natural contour grading **as identified under Land Use Element Goal LU-1, Policy LU-1.2, Action LU-1.2.3**.

Action CN-1.1.7: Use existing trees and additional tree planting to blend new development and manufactured slopes with the natural setting, especially in highly visible locations.

Action CN-1.1.8: Preserve existing significant trees where feasible, and extensively plant new trees consistent with **the** City tree **protection ordinance.** ~~policies.~~

Policy CN-1.2: Preserve and protect Chino Hills' biological resources.

Action CN-1.2.1: Preserve natural open spaces that act as wildlife corridors.

Action CN-1.2.2: Discourage new development in areas that contain sensitive, rare, or endangered species, oak woodlands, chaparral, and riparian habitats

Action CN-1.2.3: Preserve oak woodlands, riparian areas, and fresh water marshes to the maximum extent feasible.

Action CN-1.2.4: Require **and monitor compliance with the City tree protection ordinance.** ~~City approval to remove trees that in the opinion of the City function as an important part of the City's or a neighborhood's aesthetics character.~~

Action CN-1.2.5: Limit channeling of streams to the minimal improvements necessary for flood control as determined by a City-approved project-specific hydrologic analysis, **and encourage these improvements to have a natural appearance.**

Action CN-1.2.6: Require biological resources surveys prior to proposed development within the Biotic Resources Overlay District and in other areas where there is a potential for special-status species or habitat to occur.

Action CN-1.2.7: Require a wildlife movement study for any project, including any new or extended roadway, potentially adversely affecting wildlife movement. This shall include identification of, and if warranted mitigation to protect, existing habitat linkages, wildlife corridors, wildlife movement in the vicinity, and crossing structures at freeways and major roadways; and recommended project design changes and avoidance, minimization, and mitigation measures to offset potentially significant adverse impacts to wildlife movement. For a new or extended roadway that is anticipated to result in a significant adverse impact to wildlife movement, require project design changes and/or avoidance, minimization, and/or mitigation measures which could include, but not be limited to: construction of wildlife crossings (e.g., underpass, overpass), fencing to guide wildlife, native plant restoration, and/or a lighting plan (to ensure that any new lighting does not deter wildlife through remaining habitat linkages.

Goal CN-2: Protect Chino Hills' Cultural Resources

Policy CN-2.1: Protect Chino Hills' archaeological resources.

Action CN-2.1.1: Require appropriate archaeological surveys as part of the environmental review process where archaeological resources may be present.

Action CN-2.1.2: Require on-site inspections by a qualified archaeologist during grading activities where archaeological resources may be present.

Action CN-2.1.3: Where archaeological resources are found during development activities, require identified archaeological materials to be preserved, restored, cataloged, and/or transmitted to the appropriate repository or as otherwise directed by a qualified professional archaeologist.

Action CN-2.1.4: Consult with local Native American tribes as required to avoid impacts on tribal cultural archaeological resources.

Policy CN-2.2: Protect Chino Hills' paleontological resources.

Action CN-2.2.1: Require appropriate paleontological surveys as part of the environmental review process where paleontological resources may be present.

Action CN-2.2.2: Where paleontological resources are found during development activities, require on-site inspections by a qualified paleontologist during grading activities where paleontological resources may be present.

Action CN-2.2.3: Require identified paleontological materials to be preserved, restored, cataloged, and/or transmitted to the appropriate repository or as otherwise directed by a qualified professional paleontologist.

Policy CN-2.3: Protect Chino Hills' potential historical resources.

Action CN-2.3.1: Prior to a change of land use or other action on the Boys Republic property that could disturb a potential historic resource, require a historic resource survey of the property by a qualified historic resource consultant, and consider incorporating any recommendations as requirements into subsequent development approval.

Action CN-2.3.2: Prior to a change of land use or other action on the Tres Hermanos property that could disturb a potential historic resource, require a historic resource survey of the property by a qualified historic **resource consultant, and consider incorporating any recommendations as requirements into subsequent development approval**.

Action CN-2.3.3: Prior to grading on-site of the original clubhouse of the 1925 Los Serranos Country Club, require an appropriate archaeological survey to determine the presence of artifacts associated with the former Bridger/Gird Adobe site and consider incorporating any recommendations as requirements into subsequent development approval.

~~Action CN-2.3.4: Consider placement of markers to acknowledge the local importance to Chino Hills' history of the Carbon Canyon and English Road equestrian communities.~~

Action CN-2.3.**4**~~5~~: For structures over 45 years old, review available City building records and make a determination regarding the structure's potential historical significance prior to permitting its demolition or substantial alteration.

Goal CN-3: Promote Sustainable Practices that Conserve Natural Resources and Reduce Greenhouse Gas Emissions

Policy CN-3.1: Endorse green building design in new and existing construction.

Action CN-3.1.1: Implement green building policies that promote increased use of energy efficiency, alternative energy, recycled materials, renewable resources, local materials, water efficiency, and pollution reduction.

Action CN-3.1.2: Establish programs that encourage homeowners to reduce energy consumption.

Action CN-3.1.3: Seek available funding sources that can be applied toward green building programs.

Action CN-3.1.4: Coordinate with state and regional agencies to ensure that alternative energy facilities are compatible with Chino Hills' natural and built environment.

Policy CN-3.2: **Continue to participate in County** ~~Develop~~ and **regional greenhouse gas reduction programs**. ~~implement a Climate Action Plan.~~

Action CN-3.2.1: Reduce greenhouse gas emissions in City operations.

Action CN-3.2.2: Power City vehicles and equipment with reduced carbon dioxide emission fuels.

Action CN-3.2.3: Provide **greenhouse gas reduction** ~~Climate Action Plan~~ information and resources to the Chino Hills community.

Goal CN-4: Ensure Adequate Water Supply and Delivery

Policy CN-4.1: Promote water conservation.

Action CN-4.1.1: Continue to implement water conservation programs to sustain potable water sources.

Action CN-4.1.2: Promote use of drought-tolerant plant materials and low-water-usage irrigation systems.

Action CN-4.1.3: Promote low-water-use plantings and materials in City street medians and parkways.

Action CN-4.1.4: Continue to use reclaimed water for non-potable water supplies wherever not precluded by public health considerations.

Policy CN-4.2: Plan for water resources and distribution.

Action CN-4.2.1: Continue master **planning for** ~~plan~~ water supply and distribution to meet current and projected City demands.

Action CN-4.2.2: Implement water master plan policies through the City's capital improvement program.

Policy CN-4.3: Protect water quality.

Action CN-4.3.1: Protect water resources from urban runoff and other potential pollution sources through implementation of best management practices and area-wide Urban Storm Water Runoff Programs.

Action CN-4.3.2: Require reclaimed water to meet the Regional Quality Control Board requirements.

Action CN-4.3.3: Support appropriate ground water contamination ~~i~~nvestigations and cleanup efforts by the local water agencies, the Regional Water Quality Control Board, and responsible private parties.

Goal CN-5: Provide for Adequate and Efficient Solid Waste Disposal

Policy CN-5.1: Meet the City's solid waste disposal needs, while maximizing opportunities for waste reduction and recycling.

Action CN-5.1.1: **Partner with** ~~Implement~~ the **City's franchised solid waste hauler to host regular cleanup events, including e-waste collection**. ~~City's Source Reduction and Recycling Element as required by the California Integrated Waste Management Act~~.

Action CN-5.1.2: **Work with** ~~Publicize and educate~~ the **County of San Bernardino and the City's franchised solid** ~~public about~~ waste **hauler to advertise programs** ~~reduction techniques~~ and **locations accepting household hazardous materials, such as paint, batteries, motor oil and oil filters**. ~~facilities.~~

Goal CN-6: Promote Clean Air to Reduce Adverse Effects on Human Health and the Environment

Policy CN-6.1: Reduce air pollution through coordinated land use, transportation, and energy use planning.

Action CN-6.1.1: Endorse regional air quality and transportation management plans in order to reduce air pollution emissions and vehicle trips.

Action CN-6.1.2: Review CEQA checklist for Air Quality Impacts to sensitive land uses and model mitigation measures consistent with the most recent CAPCOA handbook.

Action CN-6.1.3~~.2~~: Encourage multifamily development to develop close to existing/planned transit and commercial areas to encourage pedestrian and non-automobile traffic.

Action CN-6.1.**4**~~3~~: Promote transit that serves the City and links to adjacent cities and counties.

Action CN-6.1.**5**~~4~~: Provide commercial areas that are conducive to pedestrian and bicycle circulation.

Action CN-6.1.**6**~~5~~: Provide a coordinated system of pedestrian and bikeways.

Action CN-6.1.**7**~~6~~: Encourage businesses to alter truck delivery routes and local delivery schedules to off-peak hours.

Policy CN-6.2: Reduce air pollution impacts on health.

Action CN-6.2.1: **Locate residential** ~~Encourage compliance with the California Air Resources Board (CARB) "Air Quality~~ and **other** ~~Land Use Handbook: A Community Health Perspective," which provides guidelines for siting new~~ sensitive land uses **away from freeways and other major** ~~in proximity to~~ air pollutant emitting sources.

Action CN-6.2.2: Require landscaping, ventilation systems, double-paned windows, setbacks, barriers, air filters and other measures to achieve healthy indoor air quality levels in the development of new sensitive land uses.

Action CN-6.2.3: Provide public information to let residents living within 1,000 feet of a freeway know what the risks are and what mitigation measures they can take. These would include things such as installing high-efficiency air filters, keeping windows

closed in the early morning, refraining from outdoor exercise in the mornings, installing thick landscaping, reducing driving, and using public transport instead.

Action CN-6.2.4: Prioritize tree planting on high volume roadways adjacent to sensitive uses.

Action CN-6.2.5 ~~.2~~: Require businesses to limit air pollution emissions in compliance with state and regional regulations and to reduce health impacts on sensitive land uses.

Action CN-6.2.**6** ~~3~~: Require businesses to limit odor emissions to eliminate or reduce nuisance impacts on sensitive land uses.

Policy CN-6.3: Reduce air pollution emissions from construction activities.

Action CN-6.3.1: Require preparation of air quality analyses of construction-related air quality impacts using the latest available air emissions model or other analytical method determined in conjunction with SCAQMD for all projects subject to the California Environmental Quality Act (CEQA). If such analyses identify potentially significant regional or local air quality impacts, require the incorporation of appropriate mitigation to reduce such impacts.

Action CN-6.3.2: Encourage large construction projects to mitigate diesel exhaust emissions through the use of alternative fuels and control devices.

Action CN-6.3:3: Require dust abatement actions for all new construction and redevelopment projects.

Policy CN-6.4: Reduce air pollution emissions from new development.

Action CN-6.4.1: Require preparation of air quality analyses that analyze operational air quality impacts using the latest available air emissions model or other analytical method determined in conjunction with SCAQMD for all projects subject to the California Environmental Quality Act (CEQA). If such analyses identify potentially significant regional or local air quality impacts, require the incorporation of appropriate mitigation to reduce such impacts.

ECONOMIC ELEMENT

The following goals, policies, and actions support the City's Economic Development Plan to maintain and enhance the City's high quality mix of sustainable land uses and monitor future growth.

Goal ED-1: Promote a Diversified Economic Base

Policy ED-1.1: Promote commercial service uses targeted to serve Chino Hills residents and shoppers from other areas.

Action ED-1.1.1: Concentrate major commercial uses near the SR-71 Freeway **and major arterials**.

Action ED-1.1.2: Encourage ~~uses near the SR-71 Freeway and major~~ commercial **uses** ~~arterials~~ that have a positive net fiscal benefit to the City.

Action ED-1.1.3: Continue to expand commercial activity in the City by emphasizing retail stores that serve regional, rather than purely local, needs.

Action ED-1.1.4: Promote and maintain levels of shopping, services, and entertainment that are appropriate to meet the market demand of the community and the region.

Action ED-1.1.5: Ensure the development of an aesthetically attractive and balanced commercial sector compatible with the community and recognizing the predominantly residential character of Chino Hills.

Action ED-1.1.6. Strive to locate grocery and other healthy food retailers within a short or walking distance of all residents.

Action ED-1.1.7. Support farmer's markets in the community.

Policy ED-1.2: Promote employment opportunities in Chino Hills.

Action ED-1.2.1: Promote a broad range of employment opportunities for Chino Hills residents that are compatible with the community's ~~low-density~~ residential character and the skills and education of Chino Hills' workforce.

Action ED-1.2.2: Concentrate major business park and office development near the SR-71 Freeway **and major arterials**.

Action ED-1.2.3: Work with regional agencies to promote employment growth coordinated with the availability of adequate housing and transportation.

Action ED-1.2.4: Encourage child care/day care centers in proximity to employment centers and residential areas.

Goal ED-2: Support Managed Growth with Sound Fiscal Policies

Policy ED-2.1: Promote fiscal policies that support local tax-generating land uses.

Action ED-2.1.1: Where appropriate, offer development agreements for prospective developments that would have a positive net fiscal benefit to the City.

Action ED-2.1.2: Where appropriate, seek state and regional funding sources for infrastructure needed to support tax-generating land uses.

Action ED-2.1.3: Require new development to contribute its share of cost of providing necessary public services and infrastructure through equitable fees and exactions.

Policy ED-2.2: Review City fees annually to ensure appropriate relationship between fees and services.

Action ED-2.2.1: Set development fees as needed to provide adequate infrastructure and services for new development.

Action ED-2.2.2: Set municipal service fees as needed to maintain adequate infrastructure and services for existing residents and businesses.

LAND USE ELEMENT

The following goals, policies, and actions support the City of Chino Hills Land Use Plan and its vision to preserve and enhance high quality, balanced development; the rural character of the natural environment; ample private and public services; sustainable land use patterns; community character; ~~and~~ healthy living**; and environmental justice**.

Goal LU-1: Protect Chino Hills' Natural Environment

Policy LU-1.1: Preserve Chino Hills' Rural Character by Limiting Intrusion of Development into Natural Open Spaces.

Action LU-1.1.1: Continue to monitor, enforce, and update as required the adopted City hillside development standards.

Action LU-1.1.2: **Continue to protect City-designated** ~~Discourage new development from obstructing public views of~~ extremely prominent ridgelines, prominent ridgelines, **and** knolls **from intrusion by development**. ~~, significant open spaces, or important visual resources as identified in the Municipal Code.~~

Action LU-1.1.3: Ensure that new development conforms to the unique natural setting of each area and site, retaining the character of existing landforms and preserving significant native vegetation.

Action LU-1.1.4: Continue to require ridgelines and natural slopes to be dedicated and maintained as open space as required by the Municipal Code.

Action LU-1.1.5: Maintain open space requirements for new development based on the slope of the land as required by the Municipal Code; and require that a percentage of required open space be left in its natural state.

Action LU-1.1.6: Cluster development where appropriate to minimize grading, and roadway and driveway intrusions into sensitive habitat areas, open spaces, and Chino Hills State Park.

Action LU-1.1.7: Prohibit development in areas adjacent to Chino Hills State Park (for example, ridgelines), which would result in urban runoff to the watershed of the Park.

Action LU-1.1.8: Continue to require residential tract development to preserve open space based on the slope of the land.

Action LU-1.1.9: In areas adjacent to Chino Hills State Park, require substantial open space buffers between the proposed development and the State Park.

~~Action LU-1.1.7: Discourage development on slopes over 30%.~~

~~Action LU-1.1.8: Strongly discourage development on slopes over 40%.~~

Action LU-1.1.**10**~~9~~: Promote preservation of natural features such as streams, rock outcroppings, and unique vegetative clusters.

Action LU-1.1.**11**~~10~~: Use dedicated open space, as opposed to built barriers, as a buffer between development areas, wherever possible.

~~Action LU-1.1.11: Require contour grading, and encourage grading techniques that simulate the varied gradients and rounded contours of natural landforms.~~

Action LU-1.1.12: Design roads and driveways for hillside residential development that conforms to existing topography and that minimizes grading and retaining walls.

Action LU-1.1.13: ~~In areas adjacent to Chino Hills State Park, require substantial open space buffers between the proposed development and the Park.~~

~~Action LU-1.1.14:~~ Discourage development intrusions on biological resources **identified** ~~Action LU-1.1.15: Retain natural drainage courses~~ in **the Conservation Element**. ~~all cases where an independent hydrologic review of a specific development project finds that such preservation of natural drainage is physically feasible and where preservation of the natural feature will not render the subject project economically unviable~~.

Action LU-1.1.**14**~~16~~: Use designated fuel modification zones to buffer natural areas and new residential development.

Action LU-1.1.15: ~~17: For the~~ **Maintain the** southeastern portion of the City designated with an asterisk as "*40 ac. min. lot size" in the City's Zoning Map**.** ~~dated January 14, 2013 as shown in Figure 3-2 of the General Plan Update EIR, retain the City's General Plan policies and statements adopted and in effect prior to this General Plan Update.~~ The existing designations for this southeastern portion remain unchanged by this General Plan Update and the Zoning Map Amendment. ~~Research the City's original intent regarding the density for this southeastern portion of the City and work with the property owners and community to clarify the area's density.~~

Policy LU-1.2: Preserve and enhance the aesthetics resources of Chino Hills, including the City's unique natural resources, roadside views, and scenic resources.

Action LU-1.2.1: **Discourage new development from obstructing public views of** ~~Continue to protect City- designated~~ extremely prominent ridgelines, prominent ridgelines, ~~and~~ knolls**, significant open spaces, or important visual resources as identified in the Municipal Code.**

Action LU-1.2.2: Require buildings to be designed and to utilize materials and colors to blend with the natural terrain in hillside areas and adjacent to public open spaces, extremely prominent ridgelines, prominent ridgelines, knolls, or important visual resources as identified in the Municipal Code.

Action LU-1.2.3: In conjunction with project development, **require** contour disturbed areas that are to be retained as open space to blend with natural slopes, and revegetate the open space with native plants.

Action LU-1.2.4: Minimize the visual bulk of new development through implementation of the City residential and non-residential design guidelines.

Action LU-1.2.5: **Direct** ~~Develop~~ new development **to limit visibility** from the visitor center, the campgrounds, the parking areas, the trails, and the floors of Aliso, Telegraph and tributary canyons within the Chino Hills State Park. ~~Prohibit housing and other development on ridgelines visible to Chino Hills State Park.~~

Action LU-1.2.6: Dedicate and maintain landscaped areas as required by the City.

Goal LU-2: Balance Residential with Commercial, Business, and Public Land Uses

Policy LU-2.1: Ensure that development of commercial and business uses **meet** ~~are balanced with~~ the **needs** ~~predominantly residential character~~ of **the residents.** ~~Chino Hills.~~

Action LU-2.1.1: Ensure that new commercial and business development is consistent and compatible with the existing character of the community and meets City development standards.

Action LU-2.1.2: Continue to review, and amend as necessary, the Municipal Code to ensure that land uses and development standards reflect current market trends, community needs, and state requirements.

Action LU-2.1.3: For new developments, provide appropriate buffers between traffic-intensive land uses and roadways and residential uses.

Policy LU-2.2: Ensure balanced residential development.

Action LU-2.2.1: **Protect environmental** ~~To protect environmental~~ and visual resources within Agriculture/ Ranches and Rural Residential properties **by promoting clustering of**~~,~~ residential lots **with reduced** ~~may be clustered and~~ minimum lot **sizes,** ~~size reduced~~ provided the overall residential density of the property is **reduced**. ~~not increased.~~

Action LU-2.2.2: Continue to identify appropriate sites to meet the City's RHNA allocation.

Policy LU-2.3: Ensure public land uses and utilities **are visually and functionally compatible** ~~blend~~ with surrounding development.

Action LU-2.3.1: Require underground utilities for all new development.

Action LU-2.3.2: Require all utilities to be designed and installed in a manner that minimizes visual and environmental impacts.

Action LU-2.3.3: Locate and design public facilities to ensure visual and functional compatibility with adjacent residential and commercial land uses.

~~Action LU-2.3.3: Require all utilities to be designed and installed in a manner that minimizes visual and environmental impacts.~~

Policy LU-2.4: Manage land use plans to ensure **high quality,** ~~balanced and~~ cohesive development.

Action LU-2.4.1: **Continue to convert** ~~Track setback and other development standards for residential properties within former~~ Planned Development (PD) **districts** ~~areas, and continue~~ to **conventional zoning** ~~allow development within these areas to proceed in accordance with approved PD standards~~.

Action LU-2.4.2: **Discourage new PDs or PD amendments, and instead encourage developers to use** ~~Process applications for residential clustering in~~ the **specific** ~~Agriculture/ Ranches and Rural Residential areas through the site~~ plan ~~review~~ process **when site specific development standards are requested**.

Action LU-2.4.3: **Continue to implement the** ~~Establish minimum lot sizes for clustering in the Agriculture/Ranches and Rural Residential areas through subsequent~~ Municipal

Code **clustering provisions for designated Agricultural/Ranches and Rural Residential properties** ~~amendments~~.

Action LU-2.4.4: **Recognize and implement the Tres Hermanos Authority directives for** ~~Require development of~~ the Tres Hermanos area **within Chino Hills** ~~to be planned through~~.

Policy LU-2.5: Promote land use patterns that support a regional jobs/housing balance.

Action LU-2.5.1: Achieve a balance of commercial uses that provides for the retail, business, professional, and other service needs of City residents, and that will attract customers from the surrounding region.

Action LU-2.5.2: Create a broad range of employment opportunities for Chino Hills' residents that are compatible with the community's residential character and the skills and education of Chino Hills' work force.

Action LU-2.5.3: Concentrate major business park and commercial uses that represent a potential employment base near the Chino Valley Freeway corridor and along major arterials.

Action LU-2.5.4: Continue to review, and amend as necessary, the Municipal Code to ensure that a wide range of commercial and employment **uses are** ~~is~~ available.

Action LU-2.5.5: Encourage the revitalization of existing commercial areas.

Goal LU-3: Maintain, and enhance where feasible, the Integrity of City Neighborhoods

Policy LU-3.1: Maintain the character and quality of existing neighborhoods.

Action LU-3.1.1: **Continue and expand as feasible,** ~~Establish~~ programs to maintain and enhance the City's older areas, including **the communities of** Los Serranos, Sleepy Hollow, Canon Lane, and English Road.

Action LU-3.1.2: Maintain programs to balance the keeping of horses and large animals with contemporary land use and environmental requirements.

Action LU-3.1.3: **Protect** ~~To protect~~ the character of low density residential neighborhoods, **by discouraging** ~~discourage~~ nonresidential uses that are of a size or scale substantially larger than a typical single-family house.

Policy LU-3.2: Minimize traffic, noise, and other nuisance intrusions in residential neighborhoods.

Action LU-3.2.1: Locate assembly and other neighborhood serving facilities on the perimeter of residential neighborhoods with access to a collector street.

Action LU-3.2.2: Provide sidewalks along all streets in residential neighborhoods; and where possible, provide sidewalks in internal green belts.

Goal LU-4: Provide for Excellence in Urban Design

Policy LU-4.1: Promote high quality development.

Action LU-4.1.1: Continually monitor and amend, as necessary, the design guidelines for all types of development.

Action LU-4.1.2: Encourage rehabilitation or upgrade of aging residential, commercial, and business-related areas and structures.

Action LU-4.1.3: Screen negative views through site planning, architectural, and landscape devices.

Action LU-4.1.4: Discourage commercial signage that creates visual clutter and obstructs public views into the establishment.

Action LU-4.1.5: Ensure that all development within a recognized residential tract is of comparable or superior exterior design and materials and in accordance with City residential design guidelines to prevent partially completed residential tracts from being completed in a manner that is not aesthetically compatible with existing portions of the tract.

Action LU-4.1.6: Implement policies that require residential development to be designed at a scale that is in harmony with surrounding uses and the environment.

Policy LU- 4.2: Utilize extensive landscaping to beautify Chino Hills' **suburban and urban** ~~urbanized~~ areas.

Action LU-4.2.1: Continually monitor and upgrade the City Landscape Standards.

Action LU-4.2.2: Require landscaping to be continuously maintained in good condition.

Action LU-4.2.3: **Support use** ~~Promote landscape materials that consist~~ of drought-resistant **landscape materials** ~~plant varieties~~ complementary to the area, **and consistent with state and local landscape and water conservation requirements**.

Action LU-4.2.4: Require landscaping that uses water efficiently and reduces water use to the lowest practicable amount without a decline in the quality or quantity of landscapes.

Action LU-4.2.5: Require landscaping that protects existing habitat and creates new habitat by requiring local native plants, climate adapted non-natives, and prohibiting invasive plant species.

Policy LU-4.3: Promote high-quality public spaces.

Action LU-4.3.1: Maintain high-quality streetscape design for major corridors into and through the City.

Action LU-4.3.2: Maintain enhanced signage and landscape treatments at major entrances to the City.

Goal LU-5: Plan for Sustainable Land Uses

Policy LU-5.1: Promote infill, mixed use, and higher density development.

Action LU-5.1.1: **Continue to identify** ~~Identify~~ sites suitable for mixed use development **while maintaining** ~~within an existing urban service area and establish appropriate site-specific standards to accommodate~~ **the vitality of the commercial** ~~mixed~~ uses.

~~Action LU-5.1.2: Identify mixed use development standards that support sustainable development.~~

Action LU-5.1.**2**~~3~~: Coordinate land use patterns with transportation plans to improve and protect air quality, and reduce vehicular trips.

Action LU-5.1.**3**~~4~~: **Continue to plan** ~~Plan~~ for high density residential and mixed use development near commercial areas, major roadways, and transit facilities.

Action LU-5.1.**4**~~5~~: Encourage development to incorporate pedestrian and bicycle trails, fitness areas, and/or other facilities that promote healthy living.

Policy LU-5.2: Encourage residential density transfers to areas more suitable for residential development for more cohesive planning and preserve natural resources.

Action LU-5.2.1: Continue to collaborate with residential developers and property owners for density transfer opportunities pursuant to Measure U. Goal LU-6: Promote Healthy Balanced Neighborhoods.

Policy LU-6.1: Pursue programs and services that assist senior, disabled and lower income households locate and remain in Chino Hills neighborhoods.

Action LU-6.1.1: Engage with the target population to ensure needs are being met and pursue assistance programs where needed.

Policy LU – 6.2 - Strive to locate groceries and other healthy food retailers within a short or walking distance of all residents.

Action LU-6.2.1: Continue to work with the City's economic development consultant and property owners to encourage food retailers to occupy neighborhood commercial spaces in the city.

Policy LU – 6.3 – Support farmer's markets in the community.

Action LU-6.3.1: Continue to engage, promote, and facilitate farmers markets within commercial centers and religious institutions.

Policy LU – 6.4 – Implement Housing Element policies that support maintenance of both multifamily for-sale housing and rental housing options.

Action LU-6.4.1: Review housing policies annually during the General Plan Annual Report to ensure the facilitation of housing types.

NOISE ELEMENT

The following goals, policies, and actions support the City's Noise Plan to maintain and enhance the City's high quality mix of sustainable land uses and monitor future growth, while reducing existing and future noise levels. The Noise Plan provisions focus on reducing noise associated with traffic, operational activities, and stationary sources.

Goal N-1: Manage Existing Noise Sources

Policy N-1.1: Protect public health and welfare by eliminating or minimizing the effects of existing noise problems.

Action N-1.1.1: Control noise conditions in Chino Hills through the active, ongoing efforts of the City in coordination with other government agencies.

Action N-1.1.2: Increase public input on environmental noise issues, and establish a program for the monitoring and abatement of local noise sources.

Action N-1.1.3: Prohibit large commercial truck traffic in noise-sensitive areas, such as school sites, located in Chino Hills.

Action N-1.1.4: Restrict truck traffic to roadways that are located away from sensitive land uses.

Action N-1.1.5: Minimize through vehicular traffic in the City's residential areas.

Action N-1.1.6: Enforce state motor vehicle noise standards for cars, trucks, and motorcycles.

Action N-1.1.7: Incorporate sound attenuation measures in residential developments to achieve the City's standards. Such sound attenuation measures may include noise barriers, replacing existing windows and doors with sound-rated assemblies, insulating exterior walls and attics, and/or installing forced air ventilation.

Action N-1.1.8: Incorporate sound attenuation measures in commercial and industrial developments to ensure that mechanical equipment does not generate excessive noise levels.

Policy N-1.2: Where complaints are received by residents with regard to non-transportation noise sources (e.g., commercial/retail equipment or activities, fans, air conditioners), the City will protect the public health and welfare by implementing the following Action statement as necessary to ensure that the non-transportation noise source does not exceed the noise standards identified in Titles 6, 8 and 16 of the City of Chino Hills Municipal Code.

Action N-1.2.1: Ensure that equipment, machinery, fan, and air conditioning noise does not exceed specified levels, established in the City's Noise Ordinance.

Goal N-2: Limit New Noise Conflicts

Policy N-2.1: Minimize increases in noise levels due to new land use and transportation facility decisions.

Action N-2.1.1: Enforce the standards of Table 7-1**Error! Reference source not found.**, which specify acceptable exterior and interior noise limits for various land uses throughout the City.

Action N-2.1.2: Continue to assess projects through the subdivision, site plan, conditional use permit, and other development review processes and incorporate conditions of approval and mitigation measures that ensure noise compatibility where appropriate.

Action N-2.1.3: Require a noise study to be performed and appropriate noise attenuation to be incorporated to reduce interior noise levels to 45 dB CNEL or less prior to approving any multifamily or mixed-use residential development in an area with a CNEL of 65 dB or greater.

Action N-2.1.4: Incorporate ambient noise level considerations into land use decisions involving schools, hospitals, and similar noise sensitive uses.

Action N-2.1.5: Ensure all new developments provide adequate sound insulation or other protection from existing and projected noise sources.

Action N-2.1.6: Design new transportation facilities to minimize noise impacts on nearby sensitive sources.

Action N-2.1.7: Ensure that all new hotels, motels, multifamily and single-family dwellings to be developed within an area where the outdoor CNEL exceeds 60 dB are designed to achieve an indoor CNEL of 45 dB or less.

SAFETY ELEMENT

The following goals, policies, and actions support the City of Chino Hills Safety Plan and its vision to protect the community from unreasonable risks caused by natural and human-made hazards:

Additional policies related to mitigating natural and manmade hazards can be found in the Chino Hills Hazard Mitigation Plan.

Goal S-1~~6~~: Provide Adequate Emergency Service ~~Maintain Plans for Emergency Response~~.

Policy S-**1.1** ~~3.1~~: Ensure that new development has sufficient fire protection, police, and emergency medical services available.

Action S-1.1.1: Require the review of development proposals to determine impacts on emergency services and ensure developments meet appropriate safety standards.

Action S-1.1.2: Regularly assess emergency service response times to ensure a safe and secure environment for people and property in the community.

Policy S-**1.2** ~~6.1~~: Maintain and update the City Emergency Operations Plan (EOP) and City of Chino Hills Hazard Mitigation Plan (HMP), as required, to respond to extraordinary emergency situations associated with natural disasters, man-made disasters, technological incidents, and national security emergencies.

Action S-**1.2.1** ~~6.1.1~~:Provide for effective life safety measures and reduce property loss.

Action S-**1.2.2** ~~6.1.2~~:Provide for the rapid resumption of impacted businesses and community services.

Action S-**1.2.3** ~~6.1.3~~:Provide for accurate documentation and records required for cost recovery efforts from federal, state, and any other appropriate agencies.

Action S-**1.2.4** ~~6.1.4~~:Utilize water reservoirs, other smaller ponds, and swimming pools in the City as water sources for fire-suppression, if necessary.

Action S-**1.2.5** ~~6.1.5~~:Encourage residents to be prepared to be without electricity for three days or more in cases of emergency.

Action S-**1.2.6** ~~6.1.6~~Provide information to residents about how to shut off domestic gas supply in cases of emergency.

Action S-1.2.7: Continue to provide current and extensive emergency preparedness information on internet, social media and other communication networks to maximize community outreach.

Action S-1.2.8: Collaborate with local, regional, and state emergency management, law enforcement, and fire agencies when updating the City's EOP, City of Chino Hills HMP, and other plans related to emergency preparedness and response.

Goal S-2: Educate at-risk and underserved communities

Policy S-2.1: Develop a targeted outreach program for vulnerable populations (including non-English speakers, outdoor workers, non-white communities, individuals with chronic health conditions, seniors, persons with a disability, and homeless individuals) to educate them on how to prepare for and recover from disasters and climate change effects.

> **Action S-2.2.1: Ensure emergency preparedness information, including printed material, radio broadcasts, video, websites, and other media, is available in all languages spoken by at least 5% of the population.**
>
> **Action S-2.2.2: Develop and annually update a list of languages spoken by at least 5% of the population, using data provided by the United States Census Bureau American Community Survey.**
>
> **Action S-2.2.3: Engage community organizations and community partners to educate and distribute emergency response and preparedness information (such as evacuation procedures, evacuation routes, emergency notification protocol, home hardening tactics, etc.) to underserved and at-risk populations**.

Policy S-2.2: Develop an outreach strategy to inform the community on climate change impacts.

> **Action S-2.2.1: Include Alerts for High-heat Days in the City's Emergency Alerts, including instructions for location of resiliency hubs, cooling centers and self-care steps.**
>
> **Action S-2.2.2: Educate those who use active transportation (bicycle and pedestrian), outdoor workers, low-income households, and seniors about heat illness prevention and treatment.**
>
> **Action S-2.2.3: Partner with existing public health community outreach and engagement efforts to spread greater awareness of the impacts of climate change.**

Goal S-3: Increase the City's climate resilience.

Policy S-3.1: Identify and implement strategies to reduce water demand and support community water saving measures.

> **Action S-3.1.1: Continue to implement water conservation provisions. Distribute educational outreach materials to spread awareness of the City's water saving programs and rebates.**
>
> **Action S-3.1.2: Provide education and resources to promote the use of alternative sources of water, such as greywater, rainwater, air conditioning condensation, and foundation drainage.**

Policy S-3.2: Support greater resilience, redundancy, and reliability of local and regional infrastructure and services through collaboration, coordination, and implementation.

> **Action S-3.2.1: Assess critical facilities, including those for first responders and critical service providers to determine retrofits needed for long-term resilience to climate change-affected hazards including flooding and landslides, increased wind/storm events, an increase in high heat days, and/or wildfire.**

Action S-3.2.2: Promote the use of street trees, bioswales, understory planting, and green roofs, that provide shading, mitigate wind, tolerate drought, and resist fire, including fire resistant landscaping and street trees, and landscaped areas, as part of cooling and resilience strategies in public and private spaces. Promote the addition of shade structures in public spaces.

Action S-3.2.3: Distribute information on climate change impacts to the community with adapted communications for vulnerable populations, including but not limited to actions residents can take to reduce exposure to unhealthy conditions associated with flood damaged properties, extreme heat, and poor air quality days.

Action S-3.2.4: Increase the capacity/resilience of vulnerable populations by ensuring they have a role in decision-making surrounding climate change in their communities, particularly within the Carbon Canyon and Los Serranos neighborhoods. Partner with community organizations to promote participation in community outreach events and planning efforts related to climate change planning and resilience.

Action S-3.2.5: Site new essential public facilities and infrastructure outside of High and Very High Fire Hazard Severity Zones and FEMA Flood Hazard Zones, when feasible.

Action S-3.2.6: Require alternatives to air conditioning such as ceiling fans, air exchangers, increased insulation and low-solar-gain exterior materials to reduce peak electrical demands during high heat events to ensure reliability of the electrical grid.

Policy S-3.3: Protect energy infrastructure and increase redundancy of energy storage and distribution systems.

Action S-3.3.1: Pursue funds to establish sustainable power sources to provide redundancy and continued services for critical facilities during periods of high demand, such as extreme heat events.

Action S-3.3.2: Identify targeted and sustained funding sources to improve access to solar with battery backup to blackout -proof the homes of vulnerable populations.

Action S-3.3.3: Explore the feasibility of installing self-sufficient energy systems, such as microgrids, at city-owned facilities to minimize service disruptions during power outages triggered by a climate event.

Action S-3.3.4: Encourage weatherization retrofits of private properties and retrofit all critical facilities with adequate cooling and air filtration.

Policy S-3.4: Utilize natural and recreational open space and parks to reduce extreme heat and flood impacts.

Action S-3.4.1: Develop a plan to expand and maintain large contiguous greenspaces wherever possible for greater cooling magnitude and extent.

Action S-3.4.2: Identify opportunities and update the City's Landscape Manual to increase urban tree canopy and maintenance projects in coordination with existing efforts. of drought tolerant and native plants in landscaping.

Action S-3.4.3: Restore degraded ecosystems to enhance the natural adaptive capacity of biological communities that are vulnerable to the effects of climate change.

Action S-3.4.4: Develop an outreach program focused on vulnerable populations that provides information on staying healthy and safe before, during, and after climate hazard events.

Action S-3.4.5: Develop a program to increase tree canopy coverage in Chino Hills to contrast urban heat island effect and reduce heat inequality, focusing on areas with a tree equity score below 80, such as Los Serranos.

Policy S-3.5: Develop short-term and long-term strategies to address climate change impacts related to wildfire, extreme heat, flooding, and drought.

Action S-3.5.1: Develop a climate action plan that includes climate change projections and policies and programs to reduce impacts of climate change and address climate adaptation.

Action S-3.5.2: Incorporate climate change projections in future resource conservation plans and land use plans, including research and monitoring plans.

Action S-3.5.3: Use the most recent available data to assess climate change impacts that may affect the City, including wildfire, extreme heat, flooding, and drought.

Action S-3.5.4: Convene a climate change task force to strategize and support implementation of climate related programs.

Goal S-4: Protect City infrastructure and facilities.

Policy S-4.1: Continue to mitigate the risk of a cyber-attack and deter physical threats.

Action S-4.1.1: Authorize the City Information Technology Division to regularly update computer software and hardware to keep the network secure.

Action S-4.1.2: Authorize the City Facilities Division to strengthen the physical security at all City facilities by ensuring that only the proper personnel have access.

Goal S-5: Maintain a safe and efficient evacuation network.

Policy S-5.1: Ensure the Chino Valley Fire District has complete access to all locations in the city, including gated residential communities and critical infrastructure.

Action S-5.1.1: Require that all homes and businesses have visible street addressing and signage. Consider adopting a standardized street-addressing system.

Action S-5.1.2: Ensure roads used for emergency access are properly maintained and free of obstructions.

Action S-5.1.3: Install lighting and clear signage on emergency access routes.

Action S-5.1.4: Require all gated communities and buildings to have a KNOX box or other emergency access system to ensure quick emergency response.

Policy S-5.2: Improve emergency access and evacuation capacity for neighborhoods that have a single ingress/egress.

Action S-5.2.1: Develop and deploy evacuation and/or alternative emergency access route alternatives for single-access neighborhoods.

Action S-5.2.2: Designate and publicize evacuation routes for individual neighborhoods; including existing pedestrian pathways.

Action S-5.2.3: Encourage residents to take only one or two vehicles (based on household size) to reduce the number of evacuating vehicles. Offer offsite parking facilities to safely store secondary vehicles in advance of an emergency event.

Action S-5.2.4: Implement early evacuations under high-risk conditions for vulnerable communities with limited egress routes, including single-access neighborhoods.

Policy S-5.3: Prioritize engagement with single access neighborhoods and high wildfire risk areas to encourage home retrofits, meet current standards on structure hardening and road standards, proactively enforce defensible space standards, and conduct emergency preparedness trainings.

Action S-5.3.1: Conduct targeted evacuation outreach and communication for single-access neighborhoods and neighborhoods in the Fire Hazard Overlay District and High and Very High Fire Hazard Severity Zones to educate residents on their evacuation zone, nearby emergency shelters, and plan evacuation routes. Outreach and communication should include in-person, print, and digital outreach methods and should utilize available neighborhood-specific communication methods, including homeowners associations, Nextdoor, Ring Neighborhoods, school notification systems, etc.).

Action S-5.3.2: Encourage residents in single-access communities to maintain emergency supplies for at least 3 - 10 days.

Action S-5.3.3: In coordination with the Chino Valley Fire District and Chino Hills Police Department/San Bernardino County Sheriff's Department, conduct regular evacuation trainings with single-access community homeowner associations and residents.

Action S-5.3.4: Maintain critical evacuation routes and emergency vehicle access.

Policy S-5.4: Increase evacuation capacity and efficiency throughout the city.

Action S-5.4.1: In the event of an emergency requiring evacuation, consider implementing the following traffic management strategies to increase evacuation capacity and efficiency:

- **Reverse one or more lanes of highway to accommodate an increased flow of traffic in one direction.**
- **Redirect all lanes of a designated evacuation route to accommodate rapid evacuation from a city or region.**
- **Temporarily close inbound travel lanes on selected unlimited access arterials (such as parkways and boulevards) to allow outbound traffic to utilize these lanes during evacuation.**

- **Close inbound lanes on highways utilized for evacuation routes to prevent drivers on these routes from entering the city while evacuation is underway.**
- **Minimize left-turn movements along evacuation routes and on roads leading to evacuation routes.**
- **Increase the green time and/or progression band for through movements leading out of an evacuation zone.**
- **Install signal battery backups in case signal operations need to be maintained during a power outage. Consider using channeling devices, static signs, and coning strategies to manage intersection flow during power outage if the signals lack power.**
- **Consider how to stage tow trucks at bottleneck locations along evacuation routes to help detect and clear minor crashes and maintain traffic flows.**
- **Prioritize adding additional access to communities which are currently served by only one or two access points.**
- **Develop transportation solutions such as the use of a bus system for evacuating individuals with special needs (such as those with mobility limitations) and/or evacuating larger groups of people in fewer vehicles.**
- **Establish traffic control points (i.e., locations along designated evacuation routes with emergency management personnel) to maintain a greater degree of evacuation management. These locations could enhance the efficiency of an evacuation, reduce public confusion, and allow increased operational flexibility during an evacuation.**

Policy S-5.5: Improve evacuation communication protocols among local agencies, organizations and the general public.

Action S-5.5.1: Strengthen and maintain communication among coordinating emergency event agencies. This could be achieved through systems such as the Public Information Emergency System and Emergency Satellite Communications.

Action S-5.5.2: Use variable message board equipment and targeted installation of permanent dynamic message signs on evacuation routes to improve communication and reduce public confusion.

Action S-5.5.3: Implement a traffic control center to coordinate all evacuation activities. This center would have up to the minute reports on traffic patterns and can communicate directly with emergency officers via broadcast media, social media, and other emergency communications channels (e.g., County Telephone Emergency Notification System and San Bernardino Ready App) to let drivers know about roadway congestion and conditions and direct them to alternate routes.

Action S-5.5.4: Install traffic counters and/or CCTV cameras on freeways, which can help assess traffic flow, volume of vehicles evacuating, and monitor incidents during emergency evacuation events.

Action S-5.5.5: Implement highway advisory radio to provide information regarding primary and secondary evacuation routes and incidents to the public.

Action S-5.5.6: Consider implementing a system of pre-defined evacuation zones. Pre-defined evacuation zones can provide a common reference system for first responders and the community.

Policy S-5.6: Maintain and update the City's Evacuation Plan, in conjunction with the Emergency Operations Plan, at minimum every eight years.

Action S-5.5.1: Establish minimum standards for evacuation and emergency vehicle access to and from the new or planned development, including regulations for weight and vertical clearance, dead-end, one-way, and single-lane conditions.

Policy S-5.7: Ensure well-maintained evacuation routes that are clear of obstruction.

Action S-5.7.1: Prioritize Capital Improvement Program (CIP) projects for roadways that serve as evacuation routes or require roadway improvements to better function in the event of an evacuation.

Action S-5.7.2: Require new development to provide adequate access (ingress, egress) and a minimum of two roadways with widths and lengths in compliance with California Building Code Chapter 7A requirements.

Action S-5.7.3: Maintain evacuation roadways and shoulders to clear them of trees, vegetation, and debris that would block travel lanes and shoulders for evacuating and emergency operation vehicles.

Policy S-5.8: Coordinate with specialized organizations such as hospitals, medical associations, public service organizations, public health staff, and other providers or community groups to provide evacuation assistance to vulnerable populations.

Action S-5.8.1: Incorporate the following considerations that vulnerable populations may require during evacuation planning and outreach efforts:

- **Tailor evacuation outreach and communication protocols for those who are visually or hearing impaired, taking in to consideration that people who are blind or partially sighted may depend on their guide dogs and/or others to lead them to safety and that people with hearing difficulties may require special arrangements to receive evacuation warnings, such as visual aids and maps.**
- **Partner with neighboring cities/private/non-profit agencies to provide adequate paratransit services for those who are mobility impaired.**
- **Publicize evacuation methods for people without vehicles, including emphasizing the importance of carpooling with neighbors or other community members and providing information on transit routes and transit stops.**
- **Provide bilingual or multilingual materials to support communication with non-English speaking populations during evacuation.**
- **Communicate in advance the location and availability of hospitals or facilities with emergency/life-sustaining medical equipment such as a dialysis machine.**

- **Arrange for food, shelter, and transportation for unhoused (homeless) population. Offer age-appropriate emergency and evacuation information to homeless children.**

Action S-5.8.2: Identify areas of the city with a greater percentage of senior adults, persons with a disability, mobility impaired, and people with medical conditions, and people without vehicles.

Goal S-6 ~~S-1~~: Protect the Community from Geologic Hazards

Policy S-**6.1** ~~1.1~~: Regulate development in high-risk seismic, landslide and liquefaction hazard areas to avoid exposure to hazards.

Action S-**6.1.1** ~~1.1.1~~: Observe prudent land use planning in the Fault Hazard Zone delineated for the Chino Fault, restricting high occupancy and emergency operation facilities and limiting residential development.

Action S-**6.1.2** ~~1.1.2~~: Conduct site-specific studies on soils, seismicity, and groundwater conditions to evaluate the potential for liquefaction and related ground failure phenomena in canyon floors and the alluvial flatlands.

Action S-**6.1.3** ~~1.1.3~~: Regulate development of utility structures over 100 feet in height in geologic hazard areas ~~when~~ adjacent to existing or planned sensitive land uses.

Action S-**6.1.4** ~~1.1.4~~: Continue to regularly update Building and Fire Codes to provide for seismic safety design.

Action S-**6.1.5** ~~1.1.5~~: Support and encourage the seismic retrofitting and strengthening of existing facilities to minimize damage in the event of seismic or geologic hazards.

Action S-**6.1.6** ~~1.1.6~~: Discourage any grading beyond that necessary to create adequate and stable building pads.

Action S-**6.1.7** ~~1.1.7~~: Require all development to conform to the grading guidelines contained in the City Development Code.

Action S-**6.1.8** ~~1.1.8~~: Require fault zones to be clearly identified on tract and parcel maps to increase public awareness of fault rupture hazards.

Action S-**6.1.9** ~~1.1.9~~: Within geologic hazard overlay areas, require developments to minimize landscape irrigation.

Action S-**6.1.10** ~~1.1.10~~: Require new development to minimize peak runoff as required by the Municipal Code.

Goal S-7 ~~2~~: Protect the Community from Flooding Hazards

Policy S-**7.1** ~~2.1~~: Restrict development in areas prone to flooding or within dam inundation areas.

Action S-**7.1.1** ~~2.1.1~~: Prohibit development of residential, commercial, industrial, and emergency facilities in the 100-year flood plain and on canyon floors.

Action S-**7.1.2** ~~2.1.2~~: Discourage development of emergency facilities in dam inundation areas.

Action S-**7.1.3**~~2.1.3~~: Coordinate with the U.S. Army Corps of Engineers and the San Bernardino County Flood Control and Water Conservation District to keep current on Prado Dam Basin conditions and plans.

Action S-**7.1.4**~~2.1.4~~: Provide accurate and up-to-date maps of areas exposed to 100-year and 500-year flood hazards, based on National Flood Insurance Program criteria.

Policy S-**7.2** ~~2.2~~: Maintain adequate flood control facilities.

Action S-**7.2.1**~~2.2.1~~: Maintain and implement the City Master Drainage Plan.

Action S-**7.3.2**~~2.2.2~~: Require that the potential environmental drainage impacts of new construction be assessed and mitigated, including impacts that privately owned and operated storm drains adjacent to slopes and canyon areas would have on City and County-maintained drains.

Action S-**7.2.3**~~2.2.3~~: Review individual project designs to ensure that proposed drainage facilities will be properly linked with community-wide drainage facilities.

Action S-**7.2.4**~~2.2.4~~: Coordinate the construction of a comprehensive storm drain system with individual projects in the General Plan area to ensure that all new development will be adequately protected from flooding prior to completion of the backbone system.

Action S-**7.2.5**~~2.2.5~~: Maintain a schedule for funding of all flood control backbone facilities, including phasing.

Action S-**7.2.6**~~2.2.6~~: Require property owners to install and maintain storm drains on their properties as necessary to address drainage related to their property

Action S-**7.2.7**~~2.2.7~~: Strengthen storm drain maintenance district to prevent local flooding, and to prevent mud and debris flows from overtaxing storm drains during strong storms.

Action S-**7.2.8**~~2.2.8~~:Require measures to be undertaken to control runoff from construction sites.

Action S-**7.2.9**~~2.2.9~~: Require prompt revegetation and/or construction of newly graded sites to control erosion.

Action S-**7.2.10**~~2.2.10~~: Limit grading operations during the rainy season.

Action S-**7.2.11**~~2.2.11~~: Review individual project designs to ensure the stability of slopes adjacent to flood control facilities, which could be blocked due to slope failures.

Goal S-8: Minimize the Risk from Fire Hazards

Policy S-8.1: Actively collaborate with regional, state and federal fire agencies to coordinate and implement wildfire mitigation measures and fuel load modifications reduction zones, including load clearing, prescribed burns, fire breaks, livestock grazing, and public and private road clearance and other mitigation activities for areas proximal to the city.

Policy S-**8.2** ~~4.1~~: Maintain the water distribution system to deliver the fire flow requirements set in the City adopted Fire Code.

Action S-**8.2.1**~~4.1.1~~: Ensure adequate fire flow capabilities in the Los Serranos and Carbon Canyon areas, and other sections of the City where deficiencies may occur.

Action S-**8.2.2**~~4.1.2~~: Replace and upgrade old cast-iron pipelines and/or inadequately sized water mains when street improvements are made.

Action S-**8.2.3**~~4.1.3~~: Provide for redundant emergency distribution pipelines in areas of potential ground failure or where deemed necessary by the Fire District and City.

Policy S-**8.3** ~~4.2:~~ Continue to reduce fire risk through City development and operation policies.

Action S-**8.3.1**~~4.2.1~~: Continue to implement and enforce fuel modification zones.

Action S-**8.3.2**~~4.2.2~~: Encourage residents to plant and maintain fire-retardant slope cover to reduce the risk of brush fire in areas adjacent to canyons.

~~Action S-4.2.3: Maintain stringent site design and maintenance standards for areas with high fire hazard potential~~.

Action S-**8.3.3**~~4.2.4~~: Continue to provide for public education programs to enhance public awareness of fire safety, including the storage of flammable materials, use of fire-retardant building materials, and vegetation management in the perimeter of structures.

Action S-**8.3.4**~~4.2.5~~: Encourage the Fire District to ~~review its agreement to coordinate for~~ **maintain and update** mutual aid ~~and fire services~~ **agreements** with fire agencies from adjacent cities and counties.

Action S-**8.3.5**~~4.2.6~~: Work with the Fire District to enforce all existing codes and ordinances regarding fire protection, building inspection, and vegetation management.

Action S-**8.3.6**~~4.2.7~~: ~~Maintain~~ **Coordinate with Chino Valley Fire District and State Fire Marshall personnel to provide and maintain two points of emergency** evacuation ~~plans for~~ **, as required by SB 99**.

Action S-8.3.7: Coordinate with Southern California Edison to implement an electrical undergrounding plan with a focus on critical evacuation roadways and areas with highest wildfire risk.

Action S-8.3.8: Encourage home hardening strategies and home retrofits to meet current building standards and road standards and proactively enforce defensible space standards.

Action S-8.3.9: Prohibit new and/or intensification of existing general assembly uses in Very High Fire Hazard Severity Zones unless it is determined that there is sufficient secondary egress and that adjoining major highways and street networks are sufficient for evacuation, as well as safe access for emergency responders under a range of emergency scenarios.

Action S-8.3.10: Establish fire-smart landscaping standards to increase wildfire resistance for landscaping, such as:

- **Develop a list of approved fire-safe plants that can be used in landscaping in the Fire Hazard Overlay District, High and Very High Fire Hazard Severity Zones.**
- **Publish guidelines for strategic placement of fire-safe plants and vegetation maintenance to minimize fire risk.**
- **Develop vertical clearance standards for landscaping and street trees.**

Action S-8.3.11: Develop fuel modification plans for all new developments.

Action S-8.3.12: Support implementation of recommended projects in the Carbon Canyon CWPP.

Goal S-9~~5~~: Minimize the Risk from Hazardous Materials

Policy S-**9.1** ~~5.1:~~ Minimize risk to life and property from production, use, and storage of hazardous materials and waste.

Action S-**9.1.1**~~5.1.1~~: Continue to enforce Fire and Building Code provisions regarding secondary containment; segregation of chemicals to reduce reactivity during a release; sprinkler and alarm systems; and monitoring, venting, and automatic shut-off systems on all new developments.

Action S-**9.1.2**~~5.1.2~~: Continue to require businesses that use, store, or generate hazardous materials to annually notify the San Bernardino County Department of Environmental Health Services or appropriate County agency, and to comply with applicable regulations.

Policy S-**9.2** ~~5.2:~~ Control the transportation of toxic, explosive, and other hazardous materials.

Action S-**9.2.1**~~5.2.1~~: Require business owners to follow designated hazardous materials transportation routes.

Action S-**9.2.2**~~5.2.2~~: Coordinate with adjacent jurisdictions to maintain regional objectives for hazardous materials management.

Action S-**9.2.3**~~5.2.3~~: Regulate and limit the transport of vehicles carrying hazardous materials through the City.

Action S-**9.2.4**~~5.2.4~~: Support annual checks for leaks of high pressure fuel and natural gas transmission lines.

Policy S-**9.3** ~~5.3:~~ Monitor and enforce regulations to ensure adequate clean-up of hazardous materials and waste.

Action S-**9.3.1**~~5.3.1~~: Require all new developments occurring within areas previously utilized for oil production to mitigate any hazards associated with the oil fields.

Action S-**9.3.2**~~5.3.2~~: Confirm that oil and gas wells in areas proposed for development are abandoned to current standards set by the State.

Action S-**9.3.3**~~5.3.3~~: Confirm that existing toxics are contained, removed, and/or remediated as required by applicable federal and state standards.

OPEN SPACE ELEMENT

The following goals, policies, and actions support the City of Chino Hills Parks, Recreation and Open Space Plan and its vision to support a sustainable balance of land uses, healthy living, and ample park and recreational facilities for all residents.

Goal PR-1: Provide a high quality and ample park and recreational opportunities for all residents

Policy PR-1.1 ~~Focused Goal 2-1~~: Provide active and passive public park facilities and ~~recreation programs~~ that will satisfy the basic leisure time needs of the City's residents and enhance the quality of life in Chino Hills.

> **Action PR-1.1.1: Maintain and upgrade the existing public parks to ensure they continue to provide quality facilities to meet the needs of the residents**.
>
> **Action PR-1.1.2:** ~~Objective 2-1~~: Provide a citywide standard of at least 5 acres of improved public park land per 1000 residents (minimum 5 acres in size useable).
>
> **Action PR-1.1.3:** ~~Policy 2-5:~~ Ensure that all existing and future recreation facilities are accessible to everyone and consistent with the requirements of the Americans with Disabilities Act.
>
> **Action PR-1.1.4:** ~~Policy 2-6:~~ Provide in each park site various facilities that, at a minimum, include bike racks, picnic tables, benches, drinking fountain, restrooms, signage, concrete trash receptacles, tot lot and accommodations for at least one other sport or recreational activity.
>
> **Action PR-1.1.5: Add or improve public access to WIFI in parks.**
>
> **Action PR-1.1.6: Maintain shade trees and landscaping that makes parks more comfortable and visually appealing while adapting to extreme heat and drought.**
>
> **Action PR-1.1.7**: ~~Policy 6-3:~~ Promote use of drought tolerant and native plant material where appropriate in parks.
>
> **Action PR-1.1.8**: ~~Policy 2-7:~~ Provide adequate parking at each location to minimize parking problems on residential streets.
>
> **Action PR-1.9**: ~~Policy 6-4:~~ Maintain lighting levels suitable for safety as well as the nighttime use of community and citywide facilities without undue glare impacts on nearby residential areas.
>
> Action PR-1.1.10: ~~Policy 6-5:~~ Maintain ~~Develop~~ identification signage for all parks that is consistent with the adopted City identification program and complementary to any established theme in each park.

Policy PR-1.2: ~~Policy 2-18:~~ **Maintain the Parks** ~~Periodically review and evaluate the progress made in implementing the~~ Master Plan **as a fluid document**.

> **Action PR-1.2.1:** ~~Policy 2-17~~: **Implement the park and recreation recommendations of the Parks Master Plan as sites become available**. ~~Regularly review priorities for acquisition, development and improvement of existing and proposed facilities and programs.~~

Action PR-1.2.2: ~~Goal 2-4:~~ Continue to seek community input and community support on development of park and recreation programs.

Action PR-1.2.3: As part of future Parks Master Plan updates, consider opportunities for community gardens.

Action PR-1.2.4: Continue to ensure that parks available in all residential areas of the City.

Action PR-1.2.5: Implement Parks Master Plan recommendations to pursue funding sources for acquisition and maintenance of City park facilities.

Policy PR-1.3: ~~Objective 4-1:~~ **Provide recreational facilities and programs that will satisfy the basic** ~~Improve the quality of life through the creative and constructive~~ **use of leisure time needs of the City's residents and enhance the quality of life in Chino Hills**.

Action PR-1.3.1: ~~Focused Goal 2-3:~~ Provide a wide variety of recreation programs that meet the diverse needs of the community and contribute to the physical and mental health of the population.

Action PR-1.3.2: ~~Policy 2-12:~~ Provide multi-use facilities for the City's residents, including space for meeting rooms, athletic activities, kitchen facilities, and recreation classes and programs.

Action PR-1.3.3: ~~Policy 2-13:~~ **Locate community centers** ~~where they are accessible to public transportation systems~~ **in various locations throughout the City for the convenience of residents**.

Action PR-1.3.4: Provide an adequate supply of courts and fields for the top sports in Chino Hills, and modify or add as needed to accommodate changing sport trends.

Action PR-1.3.5: ~~Policy 4-1:~~ Enrich the cultural and creative life of the community through a diverse program of recreation opportunities for all ages and populations.

Policy PR-1.4: ~~Objective 2-5:~~ Promote the cooperation of all private and governmental entities in achieving the acquisition, development, funding, and operation of the park and recreational facilities and programs in the community.

Action PR-1.4.1: ~~Policy 2-19:~~ Continue to foster good relations with the School District ~~through the Joint Powers Agreement~~ in the design and development of school and City facilities to achieve maximum public benefit.

Action-1.4.2: ~~Policy 2-21:~~ Encourage individual and group participation in the support and development of new park and recreation facilities and programs.

Action-1.4.3: ~~Policy 2-22:~~ **Continue to promote the** ~~Expand the existing~~ City**'s existing** volunteer program to provide needed recreation services in the City by recruiting high school and college students.

Action-1.4.4: ~~Policy 2-23:~~ Work with equestrian groups to maintain the McCoy Equestrian Center and to create and maintain equestrian facilities such as trailheads, and to carry out a trail patrol and maintenance program.

Action-1.4.4: ~~Policy 4-3:~~ Joint venture with private recreational providers in the City to further expand the scope of recreation program availability.

Goal PR-2: ~~Objective 3-1:~~ Continue to plan, ~~Plan,~~ create, and maintain a system of safe accessible trails throughout the City.

Policy PR-2.1: ~~Policy 1-11:~~ Provide and maintain a multi-use trail system that safely accommodates bicycles, hikers, and equestrians.

Action PR-2.1.1: ~~Focused Goal 2-2:~~ **Maintain** ~~Develop~~ a network of multiuse trails that provides interconnectivity between Community and Neighborhood Parks, adjacent communities, the Chino Hills State Park, and areas of scenic interest.

Action PR-2.1.2: ~~Policy 3-2:~~ Integrate the planning for the trail network with the planning for streetscapes, parks, and open space.

Action PR-2.1.3: ~~Policy 3-5:~~ **Where possible, provide** ~~Provide~~ trail users with rest areas in parks and open space, including bike racks, hitching posts, water, shade, and picnic facilities where appropriate.

Action PR-2.1.4: ~~Policy 3-8:~~ Develop **and maintain** trailheads or staging areas as focal points for trail activities and to enhance access for those who must drive to the trail.

Action PR-2.1.5: ~~Policy 3-9:~~ Whenever possible, provide trail connections to regional trails, local trails, and recreation facilities in adjacent communities.

Policy PR-2.2: ~~Policy 2-8:~~ **Promote community access and use of the City trail system**. ~~Create recreation opportunities for residents through the use of the trail network.~~

Action PR-2.2.1: ~~Policy 3-10:~~ **Maintain** ~~Develop~~ a signage system that identifies trails and provides users with information regarding the trail system. Identify safety regulations, trail etiquette, difficulty, distance, and interpretive opportunities.

Action PR-2.2.2: Keep a current App based or similar system that provides a digital connection to trail maps and trail details.

~~**Policy S-1.2**~~**Goal PR-3: ~~Objective 1-1:~~ Protect and preserve City designated open space areas. ~~Develop a plan that protects and preserves the natural features of the open space while providing for use of these areas by the community.~~**

Policy PR-3.1: ~~Policy 1-1:~~ **Implement** ~~Develop a method~~ **strategies** for protecting and maintaining the open space in perpetuity, ~~and oversee the protection of these areas~~.

Action PR-3.1.1: Promote open space uses that generate revenue while limiting community impacts, such as grazing and/or agricultural production or communication facilities, where appropriate.

Action PR-3.1.2: ~~Policy 1-10:~~ Encourage dedications of open space adjacent to or connecting to the State Park.

Action PR-3.1.3: Pursue funding to ensure the long term maintenance of City open spaces, including development impact fees, assessment districts, grants, and other funding mechanisms available to the City.

Action PR-3.1.4: Provide adequate access for fire, emergency, and maintenance equipment.

Action PR-3.1.5: ~~Policy 7-5:~~ Continue to coordinate weed abatement efforts underway by the City with the Chino Valley Independent Fire District. ~~Continue a fuel modification~~

~~program for the City's open space areas in order to protect private property from loss due to wild/and fires.~~

Policy PR-3.2: Implement strategies to protect open space natural resources.

Action PR-3.2.1: Develop and implement policies to protect the open space natural resources of the Tres Hermanos property.

Action PR-3.2.2: ~~Policy 1-4:~~ Continue to protect native trees through implementation of City tree preservation policies. ~~Protect native trees and cliffsides because they pro- vide habitat for wildlife such as birds that keep the rodent population in check and add to the aesthetic value of the open space.~~

Action PR-3.2.3: Continue to protect exceptionally prominent and prominent ridgelines through implementation of City development policies.

Action PR-3.2.4: ~~Policy 7-4:~~ **Continue to implement local, state, and federal policies that protect the natural springs and waterways, and** ~~Protect the native vegetation and wildlife habitat in the City's open space areas and preserve the wildlife corridors~~ wildlife **habitats and** corridors.

~~Focused Goal 2-5: Create a strong community image for Chino Hills using the City parks and natural open space~~

~~Policy 1-2: Accept for development as public open space, only land that meets the recommendations of the City, Landscape Standards~~

~~Policy 1-6: Preserve large scale natural areas to protect biological diversity and enhance recreation opportunities~~

~~Policy 1-12: Limit grading for trails and other development in the hillsides by maintaining the natural topography where feasible~~

~~Policy 1-14: Develop and support policies to remove illegal encroachments into open space areas~~

~~Policy 2-1: Provide local park facilities and recreation areas that are appropriate for the individual neighborhoods and communities in which they are located and that reflect the needs and interests of the population they serve~~

~~Policy 2-2: Acquire, plan, develop, and staff facilities to make possible a wide variety of passive, active and organized recreation activities and opportunities to enrich the lives of the citizens~~

~~Policy 2-3: Provide policies and standards which will enable the City to provide the local parks needed for future City buildout~~

~~Policy 2-4: Accept for development as public park land only land that meets the recommendations of the City, Landscape Standards~~

~~Policy 2-9: Require park land dedicated to the City by developers of property to meet or exceed the development standards established by the City~~

~~Policy 2-10: Acquire and/or preserve diverse open spaces and provide for the advantageous use of these areas for recreation purposes and visual enjoyment.~~

~~Policy 2-11: Preserve the historical, scenic and cultural heritage sites of the community and its environs~~

~~**Objective 2-2: Develop several community centers in the City to provide focus areas for facilities and programs**~~

~~**Objective 2-3: Develop a long-term financial strategy for providing sufficient parks, recreational, and open space facilities and programs and for ensuring a stable funding mechanism for the on-going maintenance and operation of the park system when complete.**~~

~~Policy 2-14: Evaluate including new areas in City's Landscape and Lighting Districts.~~

~~Policy 2-15: Seek grant funding wherever available~~

~~**Objective 2-4: Develop an on-going program to periodically review and update the City's parks, recreation, and open space needs assessments.**~~

~~Policy 2-16: Prepare long- and short-term capital expenditure programs to finance implementation of the Parks Master Plan.~~

~~Policy 2-20: Work with the School District to determine if the school buildings that are no longer used and no longer needed could be used for park and recreation activities~~

~~Policy 3-1: Provide a multi-use trail system that safely accommodates bicycles, hikers, and equestrians~~

~~Policy 3-3: Accept for development as public trails, only lands that meet the standards contained in the Trails Master Plan.~~

~~Policy 3-4: Require all new development projects to implement the Trails Master Plan~~

~~Policy 3-7: Develop, in coordination with the State Department of Parks and Recreation, trail connections to Chino Hills State Park~~

~~Policy 3-11: Provide maps and trail signage that identifies the multi-use trails as a system for bicycles, hikers, and/or equestrians~~

~~Policy 3-12: Encourage use of the trail system through recreation programming, school field trips, and community awareness.~~

~~Policy 3-13: Provide a convenient trail system that promotes use of modes of transportation other than the automobile.~~

~~Policy 3-14: Mitigate impacts to residential homeowners adjacent to public trails through appropriate trail design.~~

~~**Objective 4-1: Improve the quality of life through the creative and constructive use of leisure time.**~~

~~Policy 4-2: Endeavor to provide recreational programs that are economically self-sustaining where possible.~~

~~Policy 4-4: Develop methods, such as newsletters or recreation brochures, to market and increase awareness of and participation in community recreation programs~~

~~**Objective 5-1: Strengthen community life by improving and enriching democratic values and increasing participation in civic activities.**~~

~~Policy 5-1: Use newsletters, the local newspapers, and other media to notify residents of City activities and events.~~

~~Policy 5-3: Include public participation in the design process for future park and facility development~~

~~**Objective 6-1: Use parks to enhance the City's overall beauty including the quality of landscaping and landscape maintenance.**~~

~~Policy 6-1: Locate parks and other recreation facilities for maximum visibility from surrounding streets~~

~~Policy 6-6: Develop a dedicated scenic pedestrian network throughout the City~~

~~**Objective 7-1: Maintenance shall maximize safety of users, promote full enjoyment of the landscape, and protect the visual and environmental qualities of the landscape**~~

~~Policy 7-2: Prune trees as necessary to preserve visual access for pedestrians and vehicular traffic~~

~~Policy 7-3: Protect and carefully maintain the landscape to foster its value for air pollution mitigation, fire safety, wildlife habitat and recreation activities~~

~~Policy 7-6: Require all construction to meet City Landscape Standards.~~

~~Policy 7-7: Cooperate with private and government agencies (such as Inland Empire Resource Conservation District, California Conservation Corps, etc.) to ensure that the best management practices are utilized.~~

~~Policy 7-8: Parks shall regularly be reviewed by a group of professionals with diverse perspectives for safety items and risk management overview.~~

~~Policy 7-9: Design park facilities to minimize water use and maintenance demands~~

APPENDIX H: AIR QUALITY AND GREENHOUSE GAS EMISSIONS REPORT

Chino Hills General Plan Update

Air Quality and Greenhouse Gas Impact Study

City of Chino Hills

Prepared for:

Curtis Zacuto
EcoTierra Consulting
633 W 5th Street, 26th Floor
Los Angeles, CA 90071

Prepared by:

MD Acoustics, LLC
Tyler Klassen, EIT
1197 Los Angeles Ave, Ste C-256
Simi Valley, CA 93065

Date: 11/18/2024

TABLE OF CONTENTS

1.0 Introduction 1
1.1 Purpose of Analysis and Study Objectives 1
1.2 Project Summary 1
1.2.1 Existing Land Uses 1
1.2.2 Project Description 1
1.2.3 Sensitive Receptors 2
1.3 Executive Summary of Findings and Mitigation Measures 2

2.0 Regulatory Framework and Background 1
2.1 Air Quality Regulatory Setting 1
2.1.1 National and State 1
2.1.2 South Coast Air Quality Management District 3
2.2 Greenhouse Gas Regulatory Setting 5
2.2.1 International 5
2.2.2 National 6
2.2.3 California 8
2.2.4 South Coast Air Quality Management District 15
2.2.5 County of San Bernardino 17
2.2.6 City of Chino Hills 17

3.0 Setting 20
3.1 Existing Physical Setting 20
3.1.1 Local Climate and Meteorology 20
3.1.2 Local Air Quality 21
3.1.3 Attainment Status 24
3.2 Greenhouse Gases 25

4.0 Modeling Parameters and Assumptions 27
4.1 Construction 27
4.2 Operations 27
4.3 Localized Analysis 28

5.0 Thresholds of Significance 30
5.1 Air Quality Thresholds of Significance 30
5.1.1 CEQA Guidelines for Air Quality 30
5.1.2 Regional Significance Thresholds for Construction Emissions 30
5.1.3 Regional Significance Thresholds for Operational Emissions 30
5.2 Greenhouse Gas Thresholds of Significance 31
5.2.1 CEQA Guidelines for Greenhouse Gas 31
5.3 Toxic Air Contaminants 31

6.0 Air Quality Emissions Impact 32
6.1 Construction Air Quality Emissions Impact 32
6.1.1 Regional Construction Emissions 32

6.1.3 Localized Construction Emissions 32
6.1.4 Odors 33
6.1.5 Construction-Related Toxic Air Contaminant Impact 33
6.2 Operational Air Quality Emissions Impact 34
6.2.1 Regional Operational Emissions 34
6.2.3 Localized Operational Emissions 34
6.3 CO Hot Spot Emissions 35
6.4 Cumulative Regional Air Quality Impacts 35
6.5 Air Quality Compliance 36
7.0 Greenhouse Gas Impact Analysis 38
7.1 Greenhouse Gas Emissions Impact 38
7.2 Greenhouse Gas Plan Consistency 38
8.0 CEQA Analysis 40
9.0 References 42

LIST OF APPENDICES

Appendix A:
CalEEMod Unmitigated Project Emission Output

Appendix B:
CalEEMod Mitigated Project Emission Output

Appendix C:
CalEEMod Existing Emission Output

LIST OF EXHIBITS

Exhibit A 4
Land Use and Potential RHNA Site Map 4

LIST OF TABLES

Table 1: Land Use Summary 2
Table 2: Ambient Air Quality Standards 2
Table 3: Meteorological Summary 21
Table 4: Local Area Air Quality Levels from the Upland Monitoring Station 22
Table 5: South Coast Air Basin Attainment Status 24
Table 6: Description of Greenhouse Gases 26
Table 7: Regional Significance – Unmitigated Construction Emissions (pounds/day) 32
Table 8: Regional Significance – Mitigated Construction Emissions (pounds/day) 32
Table 9: Regional Significance - Unmitigated Operational Emissions (lbs/day) 34
Table 10: Regional Significance - Mitigated Operational Emissions (lbs/day) 34
Table 11: Opening Year Unmitigated Project-Related Greenhouse Gas Emissions 38

GLOSSARY OF TERMS

AQMP	Air Quality Management Plan
CAAQS	California Ambient Air Quality Standards
CARB	California Air Resources Board
CEQA	California Environmental Quality Act
CFCs	Chlorofluorocarbons
CH_4	Methane
CNG	Compressed natural gas
CO	Carbon monoxide
CO_2	Carbon dioxide
CO_2e	Carbon dioxide equivalent
DPM	Diesel particulate matter
GHG	Greenhouse gas
HFCs	Hydrofluorocarbons
LST	Localized Significant Thresholds
$MTCO_2e$	Metric tons of carbon dioxide equivalent
$MMTCO_2e$	Million metric tons of carbon dioxide equivalent
NAAQS	National Ambient Air Quality Standards
NOx	Nitrogen Oxides
NO_2	Nitrogen dioxide
N_2O	Nitrous oxide
O_3	Ozone
PFCs	Perfluorocarbons
PM	Particle matter
PM10	Particles that are less than 10 micrometers in diameter
PM2.5	Particles that are less than 2.5 micrometers in diameter
PMI	Point of maximum impact
PPM	Parts per million
PPB	Parts per billion
RTIP	Regional Transportation Improvement Plan
RTP	Regional Transportation Plan
SCAB	South Coast Air Basin
SCAQMD	South Coast Air Quality Management District
SF_6	Sulfur hexafluoride
SIP	State Implementation Plan
SOx	Sulfur Oxides
SRA	Source/Receptor Area
TAC	Toxic air contaminants
VOC	Volatile organic compounds
WRCC	Western Regional Climate Center

1.0 Introduction

1.1 Purpose of Analysis and Study Objectives

This air quality and greenhouse gas (GHG) analysis was prepared to evaluate whether the estimated criteria pollutants and GHG emissions generated from the Project would cause a significant impact to the air resources in the Project area. This assessment was conducted within the context of the California Environmental Quality Act (CEQA, California Public Resources Code Sections 21000, et seq.). The assessment is consistent with the methodology and emission factors endorsed by South Coast Air Quality Management District (SCAQMD), California Air Resource Board (CARB), and the United States Environmental Protection Agency (US EPA).

1.2 Project Summary

1.2.1 Existing Land Uses

Chino Hills is dominated by single-family housing. Other residential uses, including mobile home communities and multi-family housing developments, exist in Chino Hills but are less prevalent than single-family developments within the City. Additionally, there are several pockets of retail and light industrial land uses and parks spread throughout the city. There is also a significant amount of vacant land within the City boundaries and across its sphere of influence.

1.2.2 Project Description

The City of Chino Hills is preparing a comprehensive update to its existing General Plan. The updated Chino Hills General Plan is expected to be adopted in 2024 or 2025 and will guide the City's development and conservation through land use objectives and policy guidance. The General Plan Update is intended to be an expression of the community's vision for the City and Study Area and constitutes the policy and regulatory framework by which future development projects will be reviewed, and public improvements will be implemented. The City will implement the General Plan Update by requiring development, infrastructure improvements, and other projects to be consistent with its policies and by implementing the actions included in the General Plan Update.

The City's General Plan was last comprehensively updated in 2015, and the Housing Element was adopted in 2022. The City's Proposed General Plan Land Use Plan (Exhibit A) represents the proposed plan for land use development within the Study Area which includes the City and its Sphere of Influence. It includes labels indicating potential lower income RHNA sites. The purpose of this air quality and greenhouse gas impact analysis is to evaluate the potential for the potential lower income RHNA sites and any changes to the Roadway Circulation Plan to result in impacts to the community and to recommend mitigation measures when applicable.

Table 1 shows the CalEEMod modeling inputs for existing and proposed housing.

Table 1: Land Use Summary

Existing			
Land Use	**CalEEMod Category**	**Unit Amount**	**Size Metric**
Very High Density	Apartments High Rise	4,997	Units
Medium Density	Condo/Townhouse	633	Units
Low Density	Single Family Housing	20,071	Units
Proposed			
Land Use	**CalEEMod Category**	**Unit Amount**	**Size Metric**
Very High Density	Apartments High Rise	2,207	Units
Medium Density	Condo/Townhouse	435	Units
Low Density	Single Family Housing	207	Units
Total Existing + Proposed		**28,550**	**Units**

1.2.3 Sensitive Receptors

Sensitive receptors are considered land uses or other types of population groups that are more sensitive to air pollution than others due to their exposure. Sensitive population groups include children, the elderly, the acutely and chronically ill, and those with cardio-respiratory diseases. For CEQA purposes, a sensitive receptor would be a location where a sensitive individual could remain for 24-hours or longer, such as residencies, hospitals, and schools (etc).

The existing sensitive receptors withing the Project area are the various residential land uses including single family housing, multi-family housing, and mobile home communities.

1.3 Executive Summary of Findings and Mitigation Measures

The following is a summary of the analysis results:

Construction-Source Emissions
Project construction-source emissions would not exceed regional thresholds of significance established by the SCAQMD with inclusion of Mitigation Measure AQ-1. However, construction-source emissions from future developments within the project would have the potential to conflict with the Basin Air Quality Management Plan (AQMP) at the localized level. As discussed herein, future developments within the project will be required to comply with all applicable SCAQMD construction-source emission reduction rules and guidelines. Project construction source emissions could potentially cause or substantively contribute to violation of the California Ambient Air Quality Standards (CAAQS) or National Ambient Air Quality Standards (NAAQS). Therefore, the Project is considered to have a potentially significant and unavoidable impact.

Established requirements addressing construction equipment operations, and construction material use, storage, and disposal requirements act to minimize odor impacts that may result from construction activities. Moreover, construction-source odor emissions would be temporary, short-term, and intermittent in nature and would not result in persistent impacts that would affect substantial numbers of people. Potential construction-source odor impacts are considered less-than-significant.

Operational-Source Emissions

Air Quality Emissions Impact

The Project operational-sourced emissions would exceed applicable regional thresholds of significance established by the SCAQMD, primarily due to area sources (emissions from consumer products, architectural coatings, and landscaping equipment). Mitigation Measure AQ-1 (see below) has been incorporated to reduce VOC emissions from architectural coatings; however, with mitigation, Project operational-source emissions would still have the potential to adversely affect sensitive receptors within the Project and would therefore have a potentially **significant and unavoidable impact**. As such, Project operational-source emissions would conflict with the Basin Air Quality Management Plan (AQMP) as the Project's emissions exceed SCAQMD regional thresholds and would potentially result in a **significant cumulative impact**.

Project-related traffic will not cause or result in carbon dioxide (CO) concentrations exceeding applicable state and/or federal standards (CO "hotspots). The Project does not propose any such uses or activities that would result in potentially significant operational-source odor impacts. Potential operational-source odor impacts are therefore considered less-than-significant.

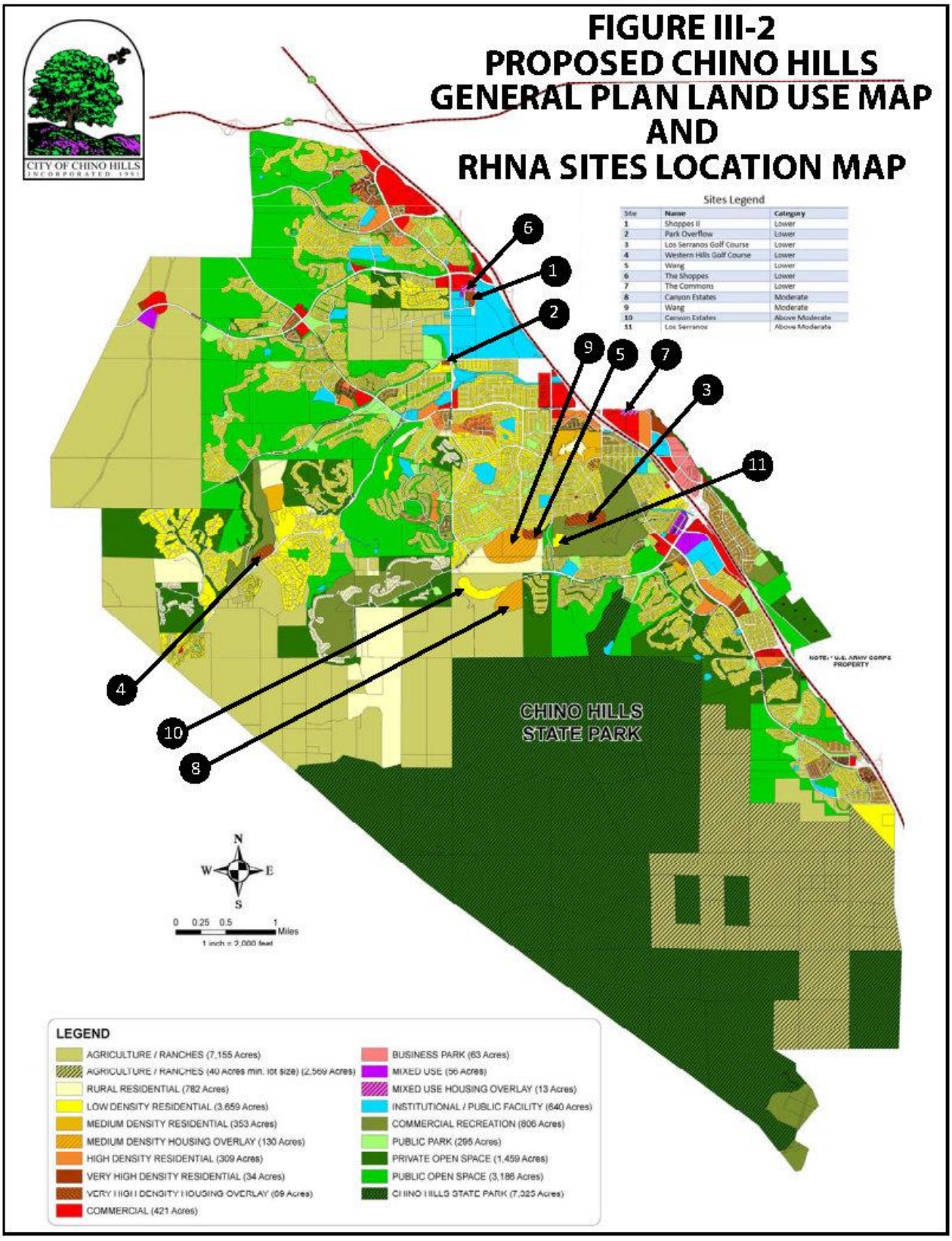
Greenhouse Gas Emissions Impact

Project-related GHG emissions meet the San Bernardino County and SCAQMD draft threshold. Therefore, Project GHG emissions are considered to be less than significant. The Project also complies with the goals of the CARB Scoping Plan, Assembly Bill (AB) 32, Senate Bill (SB) 32, County of San Bernardino Greenhouse Gas Emissions Reduction Plan, and the County of San Bernardino Climate Action Plan.

Mitigation Measures

AQ-1: All residential architectural coatings for construction and operational use shall be limited to a VOC content of 20 grams per liter.

Exhibit A
Land Use and Potential RHNA Site Map



2.0 Regulatory Framework and Background

2.1 Air Quality Regulatory Setting

Air pollutants are regulated at the national, state, and air basin level; each agency has a different level of regulatory responsibility. The United States EPA regulates at the national level. CARB regulates at the state level. SCAQMD regulates at the air basin level.

2.1.1 National and State

The EPA is responsible for global, international, and interstate air pollution issues and policies. The EPA sets national vehicle and stationary source emission standards, oversees approval of all State Implementation Plans, provides research and guidance for air pollution programs, and sets National Air Quality Standards, also known as federal standards. There are six common air pollutants, called criteria pollutants, which were identified from the provisions of the Clean Air Act of 1970.

- Ozone
- Nitrogen Dioxide
- Lead
- Particulate Matter (PM10 and PM2.5)
- Carbon Monoxide
- Particulate Matter
- Sulfur Dioxide

The federal standards were set to protect public health, including that of sensitive individuals; thus, the standards continue to change as more medical research is available regarding the health effects of the criteria pollutants. Primary federal standards are the levels of air quality necessary, with an adequate margin of safety, to protect the public health.

A State Implementation Plan is a document prepared by each state describing existing air quality conditions and measures that will be followed to attain and maintain federal standards. The State Implementation Plan for the State of California is administered by CARB, which has overall responsibility for statewide air quality maintenance and air pollution prevention. California's State Implementation Plan incorporates individual federal attainment plans for regional air districts—air district prepares their federal attainment plan, which sent to CARB to be approved and incorporated into the California State Implementation Plan. Federal attainment plans include the technical foundation for understanding air quality (e.g., emission inventories and air quality monitoring), control measures and strategies, and enforcement mechanisms. See http://www.arb.ca.gov/research/aaqs/aaqs.htm for additional information on criteria pollutants and air quality standards.

The federal and state ambient air quality standards are summarized in Table 2 and can also be found at http://www.arb.ca.gov/research/aaqs/aaqs2.pdf.

Table 2: Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards[1]		National Standards[2]		
		Concentrations[3]	Method[4]	Primary[3,5]	Secondary[3,6]	Method[7]
Ozone (O3)	1-Hour	0.09 ppm	Ultraviolet Photometry	- -	Same as Primary Standard	Ultraviolet Photometry
	8-Hour	0.070 ppm		0.070 ppm (147 µg/m³)		
Respirable Particulate Matter (PM10)[8]	24-Hour	50 µg/m³	Gravimetric or Beta Attenuation	150 µ/m³	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	20 µg/m³		- -		
Fine Particulate Matter (PM2.5)[8]	24-Hour	- -	- -	35 µg/m³	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	12 µg/m³	Gravimetric or Beta Attenuation	12 µg/m³	15 µg/m³	
Carbon Monoxide (CO)	1-Hour	20 ppm (23 µg/m³)	Non-Dispersive Infrared Photometry (NDIR)	35 ppm (40 µg/m³)	- -	Non-Dispersive Infrared Photometry (NDIR)
	8-Hour	9.0 ppm (10 µg/m³)		9 ppm (10 µg/m³)	- -	
Nitrogen Dioxide (NO_2)[9]	1-Hour	0.18 ppm (339 µg/m³)	Gas Phase Chemiluminescence	100 ppb (188 µg/m³)	- -	Gas Phase Chemiluminescence
	Annual Arithmetic Mean	0.030 ppm (357 µg/m³)		0.053 ppm (100 µg/m³)	Same as Primary Standard	
Sulfur Dioxide (SO_2)[10]	1-Hour	0.25 ppm (655 µg/m³)	Ultraviolet Fluorescence	75 ppb (196 µg/m³)	- -	Ultraviolet Fluorescence; Spectrophotometry (Pararosaniline Method)
	3-Hour	- -		- -	0.5 ppm (1300 mg/m³)	
	24-Hour	0.04 ppm (105 µg/m³)		0.14 ppm (for certain areas)[10]	- -	
	Annual Arithmetic Mean	- -		0.130ppm (for certain areas)[10]	- -	
Lead[11,12]	30 Day Average	1.5 µg/m³	Atomic Absorption	- -		
	Calendar Qrtr	- -		1.5 µg/m³ (for certain areas)[12]	Same as Primary Standard	High Volume Sampler and Atomic Absorption
	Rolling 3-Month Average	- -		0.15 µg/m³		
Visibility Reducing Particles[13]	8-Hour	See footnote 13	Beta Attenuation and Transmittance through Filter Tape	No National Standards		
Sulfates	24-Hour	25 µg/m³	Ion Chromatography			
Hydrogen Sulfide	1-Hour	0.03 ppm (42 µg/m³)	Ultraviolet Fluorescence			
Vinyl Chloride[11]	24-Hour	0.01 ppm (26 µg/m³)	Gas Chromatography			

Notes:

1. California standards for ozone, carbon monoxide, sulfur dioxide (1 and 24 hour), nitrogen dioxide, and particulate matter (PM10, PM2.5, and visibility reducing particles), are values that are not to be exceeded. All others are not to be equaled or exceeded. California ambient air quality standards are listed in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations.

2. National standards (other than ozone, particulate matter, and those based on annual arithmetic mean) are not to be exceeded more than once a year. The ozone standard is attained when the fourth highest 8-hour concentration measured at each site in a year, averaged over three years, is equal to or less than the standard. For PM10, the 24-hour standard is attained when the expected number of days per calendar year with a 24-hour average concentration above 150 µg/m³ is equal to or less than one. For PM2.5, the 24-hour standard is attained when 98 percent of the daily concentrations, averaged over three years, are equal to or less than the standard. Contact the U.S. EPA for further clarification and current national policies.

3. Concentration expressed first in units in which it was promulgated. Equivalent units given in parentheses are based upon a reference temperature of 25°C and a reference pressure of 760 torr. Most measurements of air quality are to be corrected to a reference temperature of 25°C and a reference pressure of 760 torr; ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.

4. Any equivalent measurement method which can be shown to the satisfaction of CARB to give equivalent results at or near the level of the air quality standard may be used.

5. National Primary Standards: The levels of air quality necessary, with an adequate margin of safety to protect the public health.

6. National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.

7. Reference method as described by the U.S. EPA. An "equivalent method" of measurement may be used but must have a "consistent relationship to the reference method" and must be approved by the U.S. EPA.

8. On December 14, 2012, the national annual PM2.5 primary standard was lowered from 15 µg/m^3 to 12.0 µg/m^3. The existing national 24-hour PM2.5 standards (primary and secondary) were retained at 35 µg/m^3, as was the annual secondary standard of 15 µg/m^3. The existing 24-hour PM10 standards (primary and secondary) of 150 µg/m^3 also were retained. The form of the annual primary and secondary standards is the annual mean, averaged over 3 years.

9. To attain the 1-hour national standard, the 3-year average of the annual 98th percentile of the 1-hour daily maximum concentrations at each site must not exceed 100 ppb. Note that the national 1-hour standard is in units of parts per billion (ppb). California standards are in units of parts per million (ppm). To directly compare the national 1-hour standard to the California standards the units can be converted from ppb to ppm. In this case, the national standard of 100 ppb is identical to 0.100 ppm.

10. On June 2, 2010, a new 1-hour SO2 standard was established and the existing 24-hour and annual primary standards were revoked. To attain the 1-hour national standard, the 3-year average of the annual 99th percentile of the 1-hour daily maximum concentrations at each site must not exceed 75 ppb. The 1971 SO2 national standards (24-hour and annual) remain in effect until one year after an area is designated for the 2010 standard, except that in areas designated nonattainment for the 1971 standards, the 1971 standards remain in effect until implementation plans to attain or maintain the 2010 standards are approved.

    Note that the 1-hour national standard is in units of parts per billion (ppb). California standards are in units of parts per million (ppm). To directly compare the 1-hour national standard to the California standard the units can be converted to ppm. In this case, the national standard of 75 ppb is identical to 0.075 ppm.

11. CARB has identified lead and vinyl chloride as 'toxic air contaminants' with no threshold level of exposure for adverse health effects determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants.

12. The national standard for lead was revised on October 15, 2008, to a rolling 3-month average. The 1978 lead standard (1.5 µg/m^3 as a quarterly average) remains in effect until one year after an area is designated for the 2008 standard, except that in areas designated nonattainment for the 1978 standard, the 1978 standard remains in effect until implementation plans to attain or maintain the 2008 standard are approved.

13. In 1989, CARB converted the general statewide 10-mile visibility standard to an instrumental equivalent of "extinction of 0.23 per kilometer."

Several pollutants listed in Table 2 are not addressed in this analysis. Analysis of lead is not included in this report because the Project is not anticipated to emit lead. Visibility-reducing particles are not explicitly addressed in this analysis because particulate matter is addressed. The Project is not expected to generate or be exposed to vinyl chloride because proposed Project uses do not utilize the chemical processes that create this pollutant and there are no such uses in the Project vicinity. The proposed Project is not expected to cause exposure to hydrogen sulfide because it would not generate hydrogen sulfide in any substantial quantity.

2.1.2 South Coast Air Quality Management District

The agency for air pollution control for the South Coast Air Basin (basin) is SCAQMD. SCAQMD is responsible for controlling emissions primarily from stationary sources. SCAQMD maintains air quality monitoring stations throughout the basin. SCAQMD, in coordination with the Southern California Association of Governments, is also responsible for developing, updating, and implementing the Air Quality Management Plan (AQMP) for the basin. An AQMP is a plan prepared and implemented by an air pollution district for a county or region designated as nonattainment of the federal and/or California ambient air quality standards. The term nonattainment area is used to refer to an air basin where one or more ambient air quality standards are exceeded.

Every three (3) years the SCAQMD prepares a new AQMP, updating the previous plan and having a 20-year horizon.

On March 23, 2017, CARB approved the 2016 AQMP. The 2016 AQMP is a regional blueprint for achieving the federal air quality standards and healthful air.

The 2016 AQMP includes both stationary and mobile source strategies to ensure that rapidly approaching attainment deadlines are met, that public health is protected to the maximum extent feasible, and that the region is not faced with burdensome sanctions if the Plan is not approved or if the NAAQS are not met on time. As with every AQMP, a comprehensive analysis of emissions, meteorology, atmospheric chemistry, regional growth projections, and the impact of existing control measures is updated with the latest data and methods. The most significant air quality challenge in the Basin is to reduce nitrogen oxide (NOx) emissions sufficiently to meet the upcoming ozone standard deadlines. The primary goal of the 2016 AQMP is to meet clean air standards and protect public health, including ensuring benefits to environmental justice and disadvantaged communities. Now that the plan has been approved by CARB, it has been forwarded to the U.S. Environmental Protection Agency for its review. If approved by EPA, the plan becomes federally enforceable.

South Coast AQMD has initiated the development of the 2022 AQMP to address the attainment of the 2015 8-hour ozone standard (70 ppb) for South Coast Air Basin and Coachella Valley. To support the development of mobile source strategies for the 2022 AQMP, South Coast AQMD, in conjunction with California Air Resources Board, has established Mobile Source Working Groups which are open to all interested parties.

South Coast Air Quality Management District Rules

The AQMP for the basin establishes a program of rules and regulations administered by SCAQMD to obtain attainment of the state and federal standards. Some of the rules and regulations that apply to this Project include, but are not limited to, the following:

SCAQMD Rule 402 prohibits a person from discharging from any source whatsoever such quantities of air contaminants or other material which cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public, or which endanger the comfort, repose, health or safety of any such persons or the public, or which cause, or have a natural tendency to cause, injury or damage to business or property.

SCAQMD Rule 403 governs emissions of fugitive dust during construction and operation activities. Compliance with this rule is achieved through application of standard Best Management Practices, such as application of water or chemical stabilizers to disturbed soils, covering haul vehicles, restricting vehicle speeds on unpaved roads to 15 miles per hour, sweeping loose dirt from paved site access roadways, cessation of construction activity when winds exceed 25 mph, and establishing a permanent ground cover on finished sites.

Rule 403 requires that fugitive dust be controlled with best available control measures so that the presence of such dust does not remain visible in the atmosphere beyond the property line of the emission source. In addition, Rule 403 requires implementation of dust suppression techniques to prevent fugitive dust from creating a nuisance off site. Applicable suppression techniques are indicated below and include but are not limited to the following:

- Apply nontoxic chemical soil stabilizers according to manufacturers' specifications to all inactive construction areas (previously graded areas in active for 10 days or more).
- Water active sites at least three times daily.
- Cover all trucks hauling dirt, sand, soil, or other loose materials, or maintain at least 2 feet of freeboard in accordance with the requirements of California Vehicle Code (CVC) section 23114.
- Pave construction access roads at least 100 feet onto the site from the main road.
- Reduce traffic speeds on all unpaved roads to 15 mph or less.
- Suspension of all grading activities when wind speeds (including instantaneous wind gusts) exceed 25 mph.
- Bumper strips or similar best management practices shall be provided where vehicles enter and exit the construction site onto paved roads or wash off trucks and any equipment leaving the site each trip.
- Replanting disturbed areas as soon as practical.
- During all construction activities, construction contractors shall sweep on-site and off-site streets if silt is carried to adjacent public thoroughfares, to reduce the amount of particulate matter on public streets.

SCAQMD Rule 1113 governs the sale, use, and manufacturing of architectural coating and limits the VOC content in paints and paint solvents. This rule regulates the VOC content of paints available during construction. Therefore, all paints and solvents used during construction and operation of Project must comply with Rule 1113.

Idling Diesel Vehicle Trucks – Idling for more than 5 minutes in any one location is prohibited within California borders.

Rule 2702. The SCAQMD adopted Rule 2702 on February 6, 2009, which establishes a voluntary air quality investment program from which SCAQMD can collect funds from parties that desire certified GHG emission reductions, pool those funds, and use them to purchase or fund GHG emission reduction projects within two years, unless extended by the Governing Board. Priority will be given to projects that result in co-benefit emission reductions of GHG emissions and criteria or toxic air pollutants within environmental justice areas. Further, this voluntary program may compete with the cap-and-trade program identified for implementation in CARB's Scoping Plan, or a Federal cap and trade program.

2.2 Greenhouse Gas Regulatory Setting

2.2.1 International

Many countries around the globe have made an effort to reduce GHGs since climate change is a global issue.

Intergovernmental Panel on Climate Change. In 1988, the United Nations and the World Meteorological Organization established the Intergovernmental Panel on Climate Change to assess the scientific,

technical and socio-economic information relevant to understanding the scientific basis of risk of human-induced climate change, its potential impacts, and options for adaptation and mitigation.

United Nations. The United States participates in the United Nations Framework Convention on Climate Change (UNFCCC) (signed on March 21, 1994). Under the Convention, governments gather and share information on greenhouse gas emissions, national policies, and best practices; launch national strategies for addressing greenhouse gas emissions and adapting to expected impacts, including the provision of financial and technological support to developing countries; and cooperate in preparing for adaptation to the impacts of climate change.

The 2014 UN Climate Change Conference in Lima Peru provided a unique opportunity to engage all countries to assess how developed countries are implementing actions to reduce emissions.

Kyoto Protocol. The Kyoto Protocol is a treaty made under the UNFCCC and was the first international agreement to regulate GHG emissions. It has been estimated that if the commitments outlined in the Kyoto Protocol are met, global GHG emissions could be reduced by an estimated 5 percent from 1990 levels during the first commitment period of 2008 – 2012 (UNFCCC 1997). On December 8, 2012, the Doha Amendment to the Kyoto Protocol was adopted. The amendment includes: New commitments for Annex I Parties to the Kyoto Protocol who agreed to take on commitments in a second commitment period from 2013 – 2020; a revised list of greenhouse gases (GHG) to be reported on by Parties in the second commitment period; and Amendments to several articles of the Kyoto Protocol which specifically referenced issues pertaining to the first commitment period and which needed to be updated for the second commitment period.

2.2.2 National

Greenhouse Gas Endangerment. On December 2, 2009, the EPA announced that GHGs threaten the public health and welfare of the American people. The EPA also states that GHG emissions from on-road vehicles contribute to that threat. The decision was based on *Massachusetts v. EPA* (Supreme Court Case 05-1120) which argued that GHGs are air pollutants covered by the Clean Air Act and that the EPA has authority to regulate those emissions.

Clean Vehicles. Congress first passed the Corporate Average Fuel Economy law in 1975 to increase the fuel economy of cars and light duty trucks. The law has become more stringent over time. On May 19, 2009, President Obama put in motion a new national policy to increase fuel economy for all new cars and trucks sold in the United States. On April 1, 2010, the EPA and the Department of Transportation's National Highway Safety Administration announced a joint final rule establishing a national program that would reduce greenhouse gas emissions and improve fuel economy for new cars and trucks sold in the United States.

The first phase of the national program would apply to passenger cars, light-duty trucks, and medium-duty passenger vehicles, covering model years 2012 through 2016. They require these vehicles to meet an estimated combined average emissions level of 250 grams of carbon dioxide per mile, equivalent to 35.5 miles per gallon if the automobile industry were to meet this carbon dioxide level solely through fuel economy improvements. Together, these standards would cut carbon dioxide emissions by an

estimated 960 million metric tons and 1.8 billion barrels of oil over the lifetime of the vehicles sold under the program (model years 2012-2016). The second phase of the national program would involve proposing new fuel economy and greenhouse gas standards for model years 2017 – 2025 by September 1, 2011.

On October 25, 2010, the EPA and the U.S. Department of Transportation proposed the first national standards to reduce greenhouse gas emissions and improve fuel efficiency of heavy-duty trucks and buses. For combination tractors, the agencies are proposing engine and vehicle standards that begin in the 2014 model year and achieve up to a 20 percent reduction in carbon dioxide emissions and fuel consumption by the 2018 model year. For heavy-duty pickup trucks and vans, the agencies are proposing separate gasoline and diesel truck standards, which phase in starting in the 2014 model year and achieve up to a 10 percent reduction for gasoline vehicles and 15 percent reduction for diesel vehicles by 2018 model year (12 and 17 percent respectively if accounting for air conditioning leakage). Lastly, for vocational vehicles, the agencies are proposing engine and vehicle standards starting in the 2014 model year which would achieve up to a 10 percent reduction in fuel consumption and carbon dioxide emissions by 2018 model year.

Issued by the National Highway Traffic Safety Administration (NHTSA) and EPA in March 2020 (published on April 30, 2020, and effective after June 29, 2020), the Safer Affordable Fuel-Efficient Vehicles Rule would maintain the Corporate Average Fuel Economy (CAFE) and CO2 standards applicable in model year 2020 for model years 2021 through 2026. The estimated CAFE and CO2 standards for model year 2020 are 43.7 mpg and 204 grams of CO2 per mile for passenger cars and 31.3 mpg and 284 grams of CO2 per mile for light trucks, projecting an overall industry average of 37 mpg, as compared to 46.7 mpg under the standards issued in 2012. This Rule also excludes CO2- equivalent emission improvements associated with air conditioning refrigerants and leakage (and, optionally, offsets for nitrous oxide and methane emissions) after model year 2020.[1]

Mandatory Reporting of Greenhouse Gases. On January 1, 2010, the EPA started requiring large emitters of heat-trapping emissions to begin collecting GHG data under a new reporting system. Under the rule, suppliers of fossil fuels or industrial greenhouse gases, manufacturers of vehicles and engines, and facilities that emit 25,000 metric tons or more per year of greenhouse gas emissions are required to submit annual reports to the EPA.

Climate Adaption Plan. The EPA Plan identifies priority actions the Agency will take to incorporate considerations of climate change into its programs, policies, rules and operations to ensure they are effective under future climatic conditions. The following link provides more information on the EPA Plan: https://www.epa.gov/arc-x/planning-climate-change-adaptation

[1] National Highway Traffic Safety Administration (NHTSA) and U.S. Environmental Protection Agency (USEPA), 2018. Federal Register / Vol. 83, No. 165 / Friday, August 24, 2018 / Proposed Rules, The Safer Affordable Fuel-Efficient (SAFE) Vehicles Rule for Model Years 2021–2026 Passenger Cars and Light Trucks 2018. Available at: https://www.gpo.gov/fdsys/pkg/FR-2018-08-24/pdf/2018-16820.pdf.

2.2.3 California

California Code of Regulations (CCR) Title 24, Part 6. CCR Title 24, Part 6: California's Energy Efficiency Standards for Residential and Nonresidential Buildings (Title 24) were first established in 1978 in response to a legislative mandate to reduce California's energy consumption. The standards are updated periodically to allow consideration and possible incorporation of new energy efficiency technologies and methods. Although it was not originally intended to reduce GHG emissions, electricity production by fossil fuels results in GHG emissions and energy efficient buildings require less electricity. Therefore, increased energy efficiency results in decreased GHG emissions.

The Energy Commission adopted 2008 Standards on April 23, 2008, and Building Standards Commission approved them for publication on September 11, 2008. These updates became effective on August 1, 2009. 2013, 2016, and 2019 standards have been approved and became effective July 1, 2014, January 1, 2016, and January 1, 2020, respectively.

California Code of Regulations (CCR) Title 24, Part 11.
All buildings for which an application for a building permit is submitted on or after January 1, 2020, must follow the 2019 standards. Energy efficient buildings require less electricity; therefore, increased energy efficiency reduces fossil fuel consumption and decreases greenhouse gas emissions. The following links provide more information on Title 24, Part 11:
https://www.dgs.ca.gov/BSC/Codeshttps://www.energy.ca.gov/sites/default/files/2020-03/Title_24_2019_Building_Standards_FAQ_ada.pdf

California Green Building Standards.
On January 12, 2010, the State Building Standards Commission unanimously adopted updates to the California Green Building Standards Code, which went into effect on January 1, 2011. The Housing and Community Development (HCD) updated CALGreen through the 2015 Triennial Code Adoption Cycle, during the 2016 to 2017 fiscal year. During the 2019-2020 fiscal year, the Department of Housing and Community Development (HCD) updated CALGreen through the 2019 Triennial Code Adoption Cycle.

The Code is a comprehensive and uniform regulatory code for all residential, commercial and school buildings. CCR Title 24, Part 11: California Green Building Standards (Title 24) became effective in 2001 in response to continued efforts to reduce GHG emissions associated with energy consumption. CCR Title 24, Part 11 now require that new buildings reduce water consumption, employ building commissioning to increase building system efficiencies, divert construction waste from landfills, and install low pollutant-emitting finish materials. One focus of CCR Title 24, Part 11 is water conservation measures, which reduce GHG emissions by reducing electrical consumption associated with pumping and treating water. CCR Title 24, Part 11 has approximately 52 nonresidential mandatory measures and an additional 130 provisions for optional use. Some key mandatory measures for commercial occupancies include specified parking for clean air vehicles, a 20 percent reduction of potable water use within buildings, a 50 percent construction waste diversion from landfills, use of building finish materials

that emit low levels of volatile organic compounds, and commissioning for new, nonresidential buildings over 10,000 square feet.

The 2019 CalGreen Code includes the following changes and/or additional regulations:

Single-family homes built with the 2019 standards will use about 7 percent less energy due to energy efficiency measures versus those built under the 2016 standards. Once rooftop solar electricity generation is factored in, homes built under the 2019 standards will use about 53 percent less energy than those under the 2016 standards. Nonresidential buildings will use about 30 percent less energy due mainly to lighting upgrades[2].

HCD modified the best management practices for stormwater pollution prevention adding Section 5.106.2 for projects that disturb one or more acres of land. This section requires projects that disturb one acre or more of land or less than one acre of land but are part of a larger common plan of development or sale must comply with the post-construction requirement detailed in the applicable National Pollutant Discharge Elimination System (NPDES) General Permit for Stormwater Discharges Associated with Construction and Land Disturbance Activities issued by the State Water Resources Control Board. The NPDES permits require post-construction runoff (post-project hydrology) to match the preconstruction runoff (pre-project hydrology) with installation of post-construction stormwater management measures.

HCD added sections 5.106.4.1.3 and 5.106.4.1.5 in regard to bicycle parking. Section 5.106.4.1.3 requires new buildings with tenant spaces that have 10 or more tenant-occupants, provide secure bicycle parking for 5 percent of the tenant-occupant vehicular parking spaces with a minimum of one bicycle parking facility. In addition, Section 5.106.4.1.5 states that acceptable bicycle parking facility for Sections 5.106.4.1.2 through 5.106.4.1.4 shall be convenient from the street and shall meeting one of the following: (1) covered, lockable enclosures with permanently anchored racks for bicycles; (2) lockable bicycle rooms with permanently anchored racks; or (3) lockable, permanently anchored bicycle lockers.

HCD amended section 5.106.5.3.5 allowing future charging spaces to qualify as designated parking for clean air vehicles.

HCD updated section 5.303.3.3 in regard to showerhead flow rates. This update reduced the flow rate to 1.8 GPM.

HCD amended section 5.304.1 for outdoor potable water use in landscape areas and repealed sections 5.304.2 and 5.304.3. The update requires nonresidential developments to comply with a local water efficient landscape ordinance or the current California Department of Water Resource's' Model Water

[2] https://ww2.energy.ca.gov/title24/2019standards/documents/2018_Title_24_2019_Building_Standards_FAQ.pdf

Efficient Landscape Ordinance (MWELO), whichever is more stringent. Some updates were also made in regard to the outdoor potable water use in landscape areas for public schools and community colleges.

HCD updated Section 5.504.5.3 in regard to the use of MERV filters in mechanically ventilated buildings. This update changed the filter use from MERV 8 to MERV 13.

The California Green Building Standards Code does not prevent a local jurisdiction from adopting a more stringent code as state law provides methods for local enhancements. The Code recognizes that many jurisdictions have developed existing construction and demolition ordinances, and defers to them as the ruling guidance provided, they provide a minimum 50-percent diversion requirement. The code also provides exemptions for areas not served by construction and demolition recycling infrastructure. State building code provides the minimum standard that buildings need to meet in order to be certified for occupancy. Enforcement is generally through the local building official. The following link provides more on CalGreen Building Standards:
http://www.bsc.ca.gov/Home/CALGreen.aspx

Executive Order S-3-05. California Governor issued Executive Order S-3-05, GHG Emission, in June 2005, which established the following targets:

- By 2010, California shall reduce greenhouse gas emissions to 2000 levels;
- By 2020, California shall reduce greenhouse gas emissions to 1990 levels; and
- By 2050, California shall reduce greenhouse gas emissions to 80 percent below 1990 levels.

The executive order directed the secretary of the California Environmental Protection Agency (CalEPA) to coordinate a multi-agency effort to reduce GHG emissions to the target levels. To comply with the Executive Order, the secretary of CalEPA created the California Climate Action Team (CAT), made up of members from various state agencies and commissions. The team released its first report in March 2006. The report proposed to achieve the targets by building on the voluntary actions of businesses, local governments, and communities and through State incentive and regulatory programs.

Executive Order S-01-07. Executive Order S-1-07 was issued in 2007 and proclaims that the transportation sector is the main source of GHG emissions in the State, since it generates more than 40 percent of the State's GHG emissions. It establishes a goal to reduce the carbon intensity of transportation fuels sold in the State by at least ten percent by 2020. This Order also directs CARB to determine whether this Low Carbon Fuel Standard (LCFS) could be adopted as a discrete early-action measure as part of the effort to meet the mandates in AB 32.

On April 23, 2009 CARB approved the proposed regulation to implement the low carbon fuel standard and began implementation on January 1, 2011. The low carbon fuel standard is anticipated to reduce GHG emissions by about 16 MMT per year by 2020. CARB approved some amendments to the LCFS in December 2011, which were implemented on January 1, 2013. In September 2015, the Board approved the re-adoption of the LCFS, which became effective on January 1, 2016, to address procedural deficiencies in the way the original regulation was adopted. In 2018, the Board approved amendments

to the regulation, which included strengthening and smoothing the carbon intensity benchmarks through 2030 in-line with California's 2030 GHG emission reduction target enacted through SB 32, adding new crediting opportunities to promote zero emission vehicle adoption, alternative jet fuel, carbon capture and sequestration, and advanced technologies to achieve deep decarbonization in the transportation sector.

The LCFS is designed to encourage the use of cleaner low-carbon transportation fuels in California, encourage the production of those fuels, and therefore, reduce GHG emissions and decrease petroleum dependence in the transportation sector. Separate standards are established for gasoline and diesel fuels and the alternative fuels that can replace each. The standards are "back-loaded", with more reductions required in the last five years, than the first five years. This schedule allows for the development of advanced fuels that are lower in carbon than today's fuels and the market penetration of plug-in hybrid electric vehicles, battery electric vehicles, fuel cell vehicles, and flexible fuel vehicles. It is anticipated that compliance with the low carbon fuel standard will be based on a combination of both lower carbon fuels and more efficient vehicles.

Reformulated gasoline mixed with corn-derived ethanol at ten percent by volume and low sulfur diesel fuel represent the baseline fuels. Lower carbon fuels may be ethanol, biodiesel, renewable diesel, or blends of these fuels with gasoline or diesel as appropriate. Compressed natural gas and liquefied natural gas also may be low carbon fuels. Hydrogen and electricity, when used in fuel cells or electric vehicles are also considered as low carbon fuels for the low carbon fuel standard.

SB 97. Senate Bill 97 (SB 97) was adopted August 2007 and acknowledges that climate change is a prominent environmental issue that requires analysis under CEQA. SB 97 directed the Governor's Office of Planning and Research (OPR), which is part of the State Resource Agency, to prepare, develop, and transmit to CARB guidelines for the feasible mitigation of GHG emissions or the effects of GHG emissions, as required by CEQA, by July 1, 2009. The Resources Agency was required to certify and adopt those guidelines by January 1, 2010.

Pursuant to the requirements of SB 97 as stated above, on December 30, 2009, the Natural Resources Agency adopted amendments to the state CEQA guidelines that address GHG emissions. The CEQA Guidelines Amendments changed 14 sections of the CEQA Guidelines and incorporate GHG language throughout the Guidelines. However, no GHG emissions thresholds of significance are provided and no specific mitigation measures are identified. The GHG emission reduction amendments went into effect on March 18, 2010, and are summarized below:

- Climate action plans and other greenhouse gas reduction plans can be used to determine whether a project has significant impacts, based upon its compliance with the plan.
- Local governments are encouraged to quantify the greenhouse gas emissions of proposed projects, noting that they have the freedom to select the models and methodologies that best meet their needs and circumstances. The section also recommends consideration of several qualitative factors that may be used in the determination of significance, such as the extent to which the given Project complies with state, regional, or local GHG reduction plans and policies. OPR does not set or dictate

specific thresholds of significance. Consistent with existing CEQA Guidelines, OPR encourages local governments to develop and publish their own thresholds of significance for GHG impacts assessment.

- When creating their own thresholds of significance, local governments may consider the thresholds of significance adopted or recommended by other public agencies, or recommended by experts.
- New amendments include guidelines for determining methods to mitigate the effects of greenhouse gas emissions in Appendix F of the CEQA Guidelines.
- OPR is clear to state that "to qualify as mitigation, specific measures from an existing plan must be identified and incorporated into the Project; general compliance with a plan, by itself, is not mitigation."
- OPR's emphasizes the advantages of analyzing GHG impacts on an institutional, programmatic level. OPR therefore approves tiering of environmental analyses and highlights some benefits of such an approach.
- Environmental impact reports (EIRs) must specifically consider a project's energy use and energy efficiency potential.

AB 32. The California State Legislature enacted AB 32, the California Global Warming Solutions Act of 2006. AB 32 requires that greenhouse gases emitted in California be reduced to 1990 levels by the year 2020. "Greenhouse gases" as defined under AB 32 include carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride. CARB is the state agency charged with monitoring and regulating sources of greenhouse gases. AB 32 states the following:

> Global warming poses a serious threat to the economic well-being, public health, natural resources, and the environment of California. The potential adverse impacts of global warming include the exacerbation of air quality problems, a reduction in the quality and supply of water to the state from the Sierra snowpack, a rise in sea levels resulting in the displacement of thousands of coastal businesses and residences, damage to marine ecosystems and the natural environment, and an increase in the incidences of infectious diseases, asthma, and other human health-related problems.

The CARB Board approved the 1990 greenhouse gas emissions level of 427 million metric tons of carbon dioxide equivalent (MMTCO2e) on December 6, 2007 (California Air Resources Board 2007). Therefore, emissions generated in California in 2020 are required to be equal to or less than 427 MMTCO2e. Emissions in 2020 in a "business as usual" scenario are estimated to be 596 MMTCO2e.

Under AB 32, CARB published its Final Expanded List of Early Action Measures to Reduce Greenhouse Gas Emissions in California. Discrete early action measures are currently underway or are enforceable by January 1, 2010. CARB has 44 early action measures that apply to the transportation, commercial, forestry, agriculture, cement, oil and gas, fire suppression, fuels, education, energy efficiency, electricity, and waste sectors. Of these early action measures, nine are considered discrete early action measures, as they are regulatory and enforceable by January 1, 2010. CARB estimates that the 44 recommendations are expected to result in reductions of at least 42 MMTCO2e by 2020, representing approximately 25 percent of the 2020 target.

CARB's Climate Change Scoping Plan (Scoping Plan) contains measures designed to reduce the State's emissions to 1990 levels by the year 2020 (California Air Resources Board 2008). The Scoping Plan identifies recommended measures for multiple greenhouse gas emission sectors and the associated emission reductions needed to achieve the year 2020 emissions target—each sector has a different emission reduction target. Most of the measures target the transportation and electricity sectors. As stated in the Scoping Plan, the key elements of the strategy for achieving the 2020 greenhouse gas target include:

- Expanding and strengthening existing energy efficiency programs as well as building and appliance standards;
- Achieving a statewide renewables energy mix of 33 percent;
- Developing a California cap-and-trade program that links with other Western Climate Initiative partner programs to create a regional market system;
- Establishing targets for transportation-related greenhouse gas emissions for regions throughout California and pursuing policies and incentives to achieve those targets;
- Adopting and implementing measures pursuant to existing State laws and policies, Including California's clean car standards, goods movement measures, and the Low Carbon Fuel Standard; and
- Creating targeted fees, including a public goods charge on water use, fees on high global warming potential gases, and a fee to fund the administrative costs of the State's long-term commitment to AB 32 implementation.

In addition, the Scoping Plan differentiates between "capped" and "uncapped" strategies. "Capped" strategies are subject to the proposed cap-and-trade program. The Scoping Plan states that the inclusion of these emissions within the cap-and trade program will help ensure that the year 2020 emission targets are met despite some degree of uncertainty in the emission reduction estimates for any individual measure. Implementation of the capped strategies is calculated to achieve a sufficient amount of reductions by 2020 to achieve the emission target contained in AB 32. "Uncapped" strategies that will not be subject to the cap-and-trade emissions caps and requirements are provided as a margin of safety by accounting for additional greenhouse gas emission reductions.[4]

Senate Bill 100. Senate Bill 100 (SB 100) requires 100 percent of total retail sales of electricity in California to come from eligible renewable energy resources and zero-carbon resources by December 31, 2045. SB 100 was adopted September 2018.

The interim thresholds from prior Senate Bills and Executive Orders would also remain in effect. These include Senate Bill 1078 (SB 1078), which requires retail sellers of electricity, including investor-owned utilities and community choice aggregators, to provide at least 20 percent of their supply from renewable sources by 2017. Senate Bill 107 (SB 107) which changed the target date to 2010. Executive Order S-14-08, which was signed on November 2008 and expanded the State's Renewable Energy Standard to 33 percent renewable energy by 2020. Executive Order S-21-09 directed CARB to adopt regulations by July 31, 2010 to enforce S-14-08. Senate Bill X1-2 codifies the 33 percent renewable energy requirement by 2020.

SB 375. Senate Bill 375 (SB 375) was adopted September 2008 and aligns regional transportation planning efforts, regional GHG emission reduction targets, and land use and housing allocation. SB 375 requires Metropolitan Planning Organizations (MPO) to adopt a sustainable communities strategy (SCS) or alternate planning strategy (APS) that will prescribe land use allocation in that MPOs Regional Transportation Plan (RTP). CARB, in consultation with each MPO, will provide each affected region with reduction targets for GHGs emitted by passenger cars and light trucks in the region for the years 2020 and 2035. These reduction targets will be updated every eight years but can be updated every four years if advancements in emissions technologies affect the reduction strategies to achieve the targets. CARB is also charged with reviewing each MPO's sustainable communities strategy or alternate planning strategy for consistency with its assigned targets.

The proposed Project is located within the Southern California Association of Governments (SCAG), which has authority to develop the SCS or APS. For the SCAG region, the targets set by CARB are at eight percent below 2005 per capita GHG emissions levels by 2020 and 13 percent below 2005 per capita GHG emissions levels by 2035. On April 4, 2012, SCAG adopted the 2012-2035 Regional Transportation Plan / Sustainable Communities Strategy (RTP/SCS), which meets the CARB emission reduction requirements.

On September 3, 2020, SCAG's Regional Council approved and fully adopted the Connect SoCal (2020–2045 Regional Transportation Plan/Sustainable Communities Strategy), and the addendum to the Connect SoCal Program Environmental Impact Report. Connect SoCal is a long-range visioning plan that builds upon and expands land use and transportation strategies established over several planning cycles to increase mobility options and achieve a more sustainable growth pattern. Connect SoCal outlines more than $638 billion in transportation system investments through 2045. Connect SoCal is supported by a combination of transportation and land use strategies that help the region achieve state greenhouse gas emission reduction goals and federal Clean Air Act requirements, preserve open space areas, improve public health and roadway safety, support our vital goods movement industry and utilize resources more efficiently. By integrating the Forecasted Development Pattern with a suite of financially constrained transportation investments, Connect SoCal can reach the regional target of reducing greenhouse gases, or GHGs, from autos and light-duty trucks by 8 percent per capita by 2020, and 19 percent by 2035 (compared to 2005 levels).

City and County land use policies, including General Plans, are not required to be consistent with the RTP and associated SCS or APS. However, new provisions of CEQA would incentivize, through streamlining and other provisions, qualified projects that are consistent with an approved SCS or APS and categorized as "transit priority projects."

Assembly Bill 939, Assembly Bill, and Senate Bill 1374. Assembly Bill 939 (AB 939) requires that each jurisdiction in California to divert at least 50 percent of its waste away from landfills, whether through waste reduction, recycling or other means. AB 341 requires at least 75 percent of generated waste be source reduced, recycled, or composted by the year 2020. Senate Bill 1374 (SB 1374) requires the California Integrated Waste Management Board to adopt a model ordinance by March 1, 2004 suitable for adoption by any local agency to require 50 to 75 percent diversion of construction and demolition of waste materials from landfills.

Executive Order S-13-08. Executive Order S-13-08 indicates that "climate change in California during the next century is expected to shift precipitation patterns, accelerate sea level rise and increase temperatures, thereby posing a serious threat to California's economy, to the health and welfare of its population and to its natural resources." Pursuant to the requirements in the order, the 2009 California Climate Adaptation Strategy (California Natural Resource Agency 2009) was adopted, which is the "… first statewide, multi-sector, region-specific, and information-based climate change in California, identifying and exploring strategies to adapt to climate change, and specifying a direction for future research.

Executive Order B-30-15. Executive Order B-30-15, establishing a new interim statewide greenhouse gas emission reduction target to reduce greenhouse gas emissions to 40 percent below 1990 levels by 2030, was signed by Governor Brown in April 2015.

Executive Order B-29-15. Executive Order B-29-15, mandates a statewide 25% reduction in potable water usage and was signed into law on April 1, 2015.

Executive Order B-37-16. Executive Order B-37-16, continuing the State's adopted water reduction, was signed into law on May 9, 2016. The water reduction builds off the mandatory 25% reduction called for in EO B-29-15.

Executive Order N-79-20. Executive Order N-79-20 was signed into law on September 23, 2020 and mandates 100 percent of in-state sales of new passenger cars and trucks be zero-emission by 2035; 100 percent of medium- and heavy-duty vehicles in the state be zero-emission vehicles by 2045 for all operations where feasible and by 2035 for drayage trucks; and to transition to 100 percent zero-emission off-road vehicles and equipment by 2035 where feasible.

2.2.4 South Coast Air Quality Management District

The Project is within the South Coast Air Basin, which is under the jurisdiction of SCAQMD. SCAQMD Regulation XXVII currently includes three rules:

- The purpose of Rule 2700 is to define terms and post global warming potentials.
- The purpose of Rule 2701, SoCal Climate Solutions Exchange, is to establish a voluntary program to encourage, quantify, and certify voluntary, high quality certified greenhouse gas emission reductions in the SCAQMD.
- Rule 2702, Greenhouse Gas Reduction Program, was adopted on February 6, 2009. The purpose of this rule is to create a Greenhouse Gas Reduction Program for greenhouse gas emission reductions in the SCAQMD. The SCAQMD will fund projects through contracts in response to requests for proposals or purchase reductions from other parties.

SCAQMD Threshold Development

The SCAQMD has established recommended significance thresholds for greenhouse gases for local lead agency consideration ("SCAQMD draft local agency threshold"). SCAQMD has published a five-tiered draft GHG threshold which includes a 10,000 metric ton of CO_2e per year for stationary/industrial sources and 3,000 metric tons of CO_2e per year significance threshold for residential/commercial projects (South Coast Air Quality Management District 2010c). Tier 3 is anticipated to be the primary tier by which the SCAQMD will determine significance for projects. The Tier 3 screening level for stationary sources is based on an emission capture rate of 90 percent for all new or modified projects. A 90-precent emission capture rate means that 90 percent of total emissions from all new or modified stationary source projects would be subject to CEQA analysis. The 90-percent capture rate GHG significance screening level in Tier 3 for stationary sources was derived using the SCAQMD's annual Emissions Reporting Program.

The current draft thresholds consist of the following tiered approach:

- Tier 1 consists of evaluating whether or not the Project qualifies for any applicable exemption under CEQA.
- Tier 2 consists of determining whether or not the Project is consistent with a greenhouse gas reduction plan. If a project is consistent with a qualifying local greenhouse gas reduction plan, it does not have significant greenhouse gas emissions.
- Tier 3 consists of screening values, which the lead agency can choose but must be consistent. A project's construction emissions are averaged over 30 years and are added to a project's operational emissions. If a project's emissions are under one of the following screening thresholds, then the project is less than significant:
  - All land use types: 3,000 MTCO2e per year; and
  - Based on land use types: residential is 3,500 MTCO2e per year; commercial is 1,400 MTCO2e per year; and mixed use is 3,000 MTCO2e per year
- Tier 4 has the following options:
  - Option 1: Reduce emissions from business as usual by a certain percentage; this percentage is currently undefined;
  - Option 2: Early implementation of applicable AB 32 Scoping Plan measures;
  - Option 3: Year 2020 target for service populations (SP), which includes residents and employees: 4.8 MTCO2e/SP/year for projects and 6.6 MTCO2e/SP/year for plans; or
  - Option 3, 2035 target: 3.0 MTCO2e/SP/year for projects and 4.1 MTCO2e/SP/year for plans
- Tier 5 involves mitigation offsets to achieve target significance threshold.

Therefore, to determine whether the Project's GHG emissions are significant, this analysis uses the SCAQMD draft tier 4 threshold screening threshold of 4.1 MTCO2e per Service Population per year for plans.

2.2.5 County of San Bernardino

County of San Bernardino Climate Action Plan

The County of San Bernardino adopted its "Greenhouse Gas Emissions Reduction Plan" in December in 2011. An update to the GHG Emissions Development Review Process was made in 2015. The purpose of the GHG Plan is to reduce the County's internal and external GHG emissions by 15 percent below current (2011) levels by year 2020. The GHG Plan includes a two-tiered development review procedure to determine if a project could result in a significant impact related greenhouse gas emissions or otherwise comply with the Plan pursuant to Section 15183.5 of the state CEQA Guidelines.

The initial screening procedure is to determine if a project will emit 3,000 metric tons of carbon dioxide equivalent (MTCO2e) per year or more. Projects that do not exceed this threshold require no further climate change analysis. Projects exceeding this threshold must meet a minimum 31 percent emissions reduction in order to garner a less than significant determination. This can be met by either (1) achieving 100 points from a menu of mitigation options provided in the GHG Plan or (2) quantifying proposed reduction measures. Projects failing to meet the 31 percent reduction threshold would have a potentially significant impact related to climate change and greenhouse gas emissions. An update to the GHG Emissions Development Review Process was made in March 2015 to both improve upon the menu of options available in the screening tables and to bring performance standards up to current code.

All future developments within the Project will be subject to the latest requirements of the California Green Building and Title 24 Energy Efficiency Standards (currently 2019) which would reduce Project-related greenhouse gas emissions.

2.2.6 City of Chino Hills

City of Chino Hills General Plan

The City's existing General Plan includes various policies related to reducing greenhouse gas emissions. The applicable policies to the Project are listed below.

Goal CN-3 Promote Sustainable Practices that Conserve Natural Resources and Reduce Greenhouse Gas Emissions.

Policies

Policy CN-3.1: Endorse green building design in new and existing construction.

Action CN-3.1.1: Implement green building policies that promote increased use of energy efficiency, alternative energy, recycled materials, renewable resources, local materials, water efficiency, and pollution reduction.

Action CN-3.1.2: Establish programs that encourage homeowners to reduce energy consumption.

Action CN-3.1.3: Seek available funding sources that can be applied toward green building programs.

Action CN-3.1.4: Coordinate with state and regional agencies to ensure that alternative energy facilities are compatible with Chino Hills' natural and built environment.

Policy CN-3.2: Develop and implement a Climate Action Plan.

Action CN-3.2.1: Reduce greenhouse gas emissions in City operations.

Action CN-3.2.2: Power City vehicles and equipment with reduced carbon dioxide emission fuels.

Action CN-3.2.3: Provide Climate Action Plan information and resources to the Chino Hills community.

Goal CN-6 Promote Clean Air to Reduce Adverse Effects on Human Health and the Environment.

Policies

Policy CN-6.1: Reduce air pollution through coordinated land use, transportation, and energy use planning.

Action CN-6.1.1: Endorse regional air quality and transportation management plans in order to reduce air pollution emissions and vehicle trips.

Action CN-6.1.2: Encourage multifamily development to develop close to existing/planned transit and commercial areas to encourage pedestrian and nonautomobile traffic.

Action CN-6.1.3: Promote transit that serves the City and links to adjacent cities and counties.

Action CN-6.1.4: Provide commercial areas that are conducive to pedestrian and bicycle circulation.

Policy CN-6.2: Reduce air pollution impacts on health.

Action CN-6.2.1: Encourage compliance with CARB "Air Quality and Land Use Handbook: A Community Health Perspective," which provides guidelines for siting new sensitive land uses in proximity to air pollutant emitting sources.

Action CN-6.2.2: Require businesses to limit air pollution emissions in compliance with state and regional regulations and to reduce health impacts on sensitive land uses.

Action CN-6.2.3: Require businesses to limit odor emissions to eliminate or reduce nuisance impacts on sensitive land uses.

Policy CN-6.3: Reduce air pollution emissions from construction activities.

Action CN-6.3.1: Require preparation of air quality analyses of construction-related air quality impacts using the latest available air emissions model or other analytical method determined in conjunction with SCAQMD for all projects subject to the California Environmental Quality Act (CEQA). If such analyses identify potentially significant regional or local air quality impacts, require the incorporation of appropriate mitigation to reduce such impacts.

Action CN-6.3.2: Encourage large construction projects to mitigate diesel exhaust emissions through the use of alternative fuels and control devices.

Action CN-6.3:3: Require dust abatement actions for all new construction and redevelopment projects.

Policy CN-6.4: Reduce air pollution emissions from new development.

Action CN-6.4.1: Require preparation of air quality analyses that analyze operational air quality impacts using the latest available air emissions model or other analytical method determined in conjunction with SCAQMD for all projects subject to the California Environmental Quality Act (CEQA). If such analyses identify potentially significant regional or local air quality impacts, require the incorporation of appropriate mitigation to reduce such impacts.

3.0 Setting

3.1 Existing Physical Setting

The Project site is located in the City of Chino Hills within the southwestern portion of County of San Bernardino, which is part of the South Coast Air Basin (SCAB) that includes all of Orange County as well as the non-desert portions of Los Angeles, Riverside, and San Bernardino Counties. The South Coast Air Basin is located on a coastal plain with connecting broad valleys and low hills to the east. Regionally, the South Coast Air Basin is bounded by the Pacific Ocean to the southwest and high mountains to the east forming the inland perimeter.

3.1.1 Local Climate and Meteorology

Dominant airflows provide the driving mechanism for transport and dispersion of air pollution. The mountains surrounding the region form natural horizontal barriers to the dispersion of air contaminants. Air pollution created in the coastal areas and around the Los Angeles area is transported inland until it reaches the mountains where the combination of mountains and inversion layers generally prevent further dispersion. This poor ventilation results in a gradual degradation of air quality from the coastal areas to inland areas. Air stagnation may occur during the early evening and early morning periods of transition between day and nighttime flows. The region also experiences periods of hot, dry winds from the desert, known as Santa Ana winds. If the Santa Ana winds are strong, they can surpass the sea breeze, which blows from the ocean to the land, and carry the suspended dust and pollutants out to the ocean. If the winds are weak, they are opposed by the sea breeze and cause stagnation, resulting in high pollution events.

The annual average temperature varies little throughout much of the basin, ranging from the low to middle 60s, measured in degrees Fahrenheit (°F). With more pronounced oceanic influence, coastal areas show less variability in annual minimum and maximum temperatures than inland areas where the Project site is located. The majority of the annual rainfall in the basin occurs between November and April. Summer rainfall is minimal and is generally limited to scattered thunderstorms in the coastal regions and slightly heavier showers in the eastern portion of the basin along the coastal side of the mountains. Year-to-year patterns in rainfall are unpredictable because of fluctuations in the weather.

Temperature inversions limit the vertical depth through which pollution can be mixed. Among the most common temperature inversions in the basin are radiation inversions, which form on clear winter nights when cold air off mountains sink to the valley floor while the air aloft over the valley remains warm. These inversions, in conjunction with calm winds, trap pollutants near the source. Other types of temperature inversions that affect the basin include marine, subsidence, and high-pressure inversions.

Summers are often periods of hazy visibility and occasionally unhealthful air. Strong temperature inversions may occur that limit the vertical depth through which air pollution can be dispersed. Air pollutants concentrate because they cannot rise through the inversion layer and disperse. These inversions are more common and persistent during the summer months. Over time, sunlight produces photochemical reactions within this inversion layer that creates ozone, a particularly harmful air

pollutant. Occasionally, strong thermal convections occur which allows the air pollutants to rise high enough to pass over the mountains and ultimately dilute the smog cloudtrap pollutants such as automobile exhaust near their source. While these inversions may lead to air pollution "hot spots" in heavily developed coastal areas of the basin, there is not enough traffic in inland valleys to cause any winter air pollution problems. Despite light wind conditions, especially at night and in the early morning, winter is generally a period of good air quality in the Project vicinity.

In the winter, light nocturnal winds result mainly from the drainage of cool air off of the mountains toward the valley floor while the air aloft over the valley remains warm. This forms a type of inversion known as a radiation inversion. Such winds are characterized by stagnation and poor local mixing and trap pollutants such as automobile exhaust near their source. While these inversions may lead to air pollution "hot spots" in heavily developed coastal areas of the basin, there is not enough traffic to cause any winter air pollution problems. Despite light wind conditions, especially at night and in the early morning, winter is generally a period of good air quality in the Project vicinity.

The temperature and precipitation levels for the City of Yorba Linda, the closest monitoring station to the Project site with available meteorological data, are in Table 3. Table 3 shows that August is typically the warmest month and January is typically the coolest month. Rainfall in the Project area varies considerably in both time and space. Almost all the annual rainfall comes from the fringes of mid-latitude storms from late November to early April, with summers being almost completely dry.

Table 3: Meteorological Summary

Month	Temperature (˚F)		Average Precipitation (inches)
	Average High	Average Low	
January	66.9	41.7	2.99
February	68.4	43.3	3.10
March	70.6	44.2	2.37
April	73.5	46.7	1.11
May	76.5	51.0	0.30
June	81.3	54.6	0.04
July	87.9	58.2	0.01
August	88.4	58.5	0.10
September	86.5	56.2	0.31
October	80.6	52.2	0.53
November	74.6	46.8	1.31
December	68.6	42.7	2.21
Annual Average	**77.0**	**49.7**	**14.4**

Notes:
[1] Source: https://wrcc.dri.edu/cgi-bin/cliMAIN.pl?ca9847

3.1.2 Local Air Quality

The SCAQMD is divided into 38 air-monitoring areas with a designated ambient air monitoring station representative of each area. The Project site is located in the City of Chino Hills in the Southwest San Bernardino Valley (Area 33). The nearest air monitoring station to the Project site with available air

quality data is the Upland Station located approximately 9 miles northeast of the Project site; however, this location does not provide all ambient weather data. Therefore, additional data was pulled from the SCAQMD historical data for the Southwest San Bernardino Valley (Area 33) for both sulfur dioxide and carbon monoxide to provide the existing levels. Table 4 presents the monitored pollutant levels within the vicinity. However, it should be noted that due to the air monitoring station distance from the Project site, recorded air pollution levels at the air monitoring station reflect with varying degrees of accuracy, local air quality conditions at the Project site.

Table 4: Local Area Air Quality Levels from the Upland Monitoring Station

Pollutant (Standard)[2]	Year		
	2020	2021	2022
Ozone:			
Maximum 1-Hour Concentration (ppm)	0.158	0.124	0.155
Days > CAAQS (0.09 ppm)	**82**	**42**	**45**
Maximum 8-Hour Concentration (ppm)	0.124	0.100	0.100
Days > NAAQS (0.07 ppm)	**116**	**78**	**67**
Days > CAAQS (0.070 ppm)	**118**	**81**	**69**
Carbon Monoxide:			
Maximum 1-Hour Concentration (ppm)	1.5	2.8	1.3
Days > NAAQS (20 ppm)	0	0	0
Maximum 8-Hour Concentration (ppm)	1.2	1.4	1.0
Days > NAAQS (9 ppm)	0	0	0
Nitrogen Dioxide:			
Maximum 1-Hour Concentration (ppm)	0.055	0.065	0.054
Days > NAAQS (0.25 ppm)	0	0	0
Sulfur Dioxide:			
Maximum 1-Hour Concentration (ppm)[3]	*	*	*
Days > CAAQS (0.04 ppm)[3]	*	*	*
Inhalable Particulates (PM10):			
Maximum 24-Hour Concentration (ug/m^3)	174.8	124.3	144.9
Days > NAAQS (150 ug/m^3)	1	0	0
Days > CAAQS (50 ug/m^3) [3]	*	*	*
Annual Average (ug/m^3)	33.5	32.6	30.1
Annual > NAAQS (50 ug/m^3)	No	No	No
Annual > CAAQS (20 ug/m^3)	**Yes**	**Yes**	**Yes**
Ultra-Fine Particulates (PM2.5):			
Maximum 24-Hour Concentration (ug/m^3)	74.0	83.8	66.2
Days > NAAQS (35 ug/m^3) [3]	*	*	*
Annual Average (ug/m^3) [3]	*	*	*
Annual > NAAQS (15 ug/m^3) [3]	*	*	*
Annual > CAAQS (12 ug/m^3) [3]	*	*	*

[1.] Source: obtained from https://www.aqmd.gov/home/air-quality/air-quality-data-studies/historical-data-by-year and /or https://www.arb.ca.gov/adam/topfour/topfour1.php

[2] CAAQS = California Ambient Air Quality Standard; NAAQS = National Ambient Air Quality Standard; ppm = parts per million

[3] No data available.

The monitoring data presented in Table 4 shows that ozone and particulate matter (PM10 and PM2.5) are the air pollutants of primary concern in the Project area, which are detailed below.

Ozone
During the 2020 to 2022 monitoring period, the State 1-hour concentration standard for ozone has been exceeded between 42 and 82 days each year at the Upland Station. The State 8-hour concentration standard for ozone has been exceeded between 69 and 118 days each year over the past three years at the Upland Station. The Federal 8-hour concentration standard for ozone has been exceeded between 67 and 116 days each year over the past three years at the Upland Station.

Ozone is a secondary pollutant as it is not directly emitted. Ozone is the result of chemical reactions between other pollutants, most importantly hydrocarbons and NO_2, which occur only in the presence of bright sunlight. Pollutants emitted from upwind cities react during transport downwind to produce the oxidant concentrations experienced in the area. Many areas of the SCAQMD contribute to the ozone levels experienced at the monitoring station, with the more significant areas being those directly upwind.

Carbon Monoxide
CO is another important pollutant that is due mainly to motor vehicles. The Southwest San Bernardino Valley Area did not record an exceedance of the state or federal 1-hour or 8-hour CO standards for the last three years.

Nitrogen Dioxide
The Upland Station did not record an exceedance of the State or Federal NO_2 standards for the last three years.

Sulfur Dioxide
The Southwest San Bernardino Valley area did not record an exceedance of the State SO_2 standards for the last three years.

Particulate Matter
During the 2020 to 2022 monitoring period, the Upland Station did not record an exceedance of the State 24-hour concentration standard for PM10. Over the same time period the Federal 24-hour standard for PM10 was exceeded one day in 2020 at the Upland Station.

During the 2020 to 2022 monitoring period, the Upland Station did not record an exceedance of the Federal 24-hour standard for PM2.5.

According to the EPA, some people are much more sensitive than others to breathing fine particles (PM10 and PM2.5). People with influenza, chronic respiratory and cardiovascular diseases, and the elderly may suffer worsening illness and premature death due to breathing these fine particles. People with bronchitis can expect aggravated symptoms from breathing in fine particles. Children may experience decline in lung function due to breathing in PM10 and PM2.5. Other groups considered

sensitive are smokers and people who cannot breathe well through their noses. Exercising athletes are also considered sensitive because many breathe through their mouths during exercise.

3.1.3 Attainment Status

The EPA and CARB designate air basins where ambient air quality standards are exceeded as "nonattainment" areas. If standards are met, the area is designated as an "attainment" area. If there is inadequate or inconclusive data to make a definitive attainment designation, they are considered "unclassified." National nonattainment areas are further designated as marginal, moderate, serious, severe, or extreme as a function of deviation from standards. Each standard has a different definition, or 'form' of what constitutes attainment, based on specific air quality statistics. For example, the Federal 8-hour CO standard is not to be exceeded more than once per year; therefore, an area is in attainment of the CO standard if no more than one 8-hour ambient air monitoring values exceeds the threshold per year. In contrast, the federal annual PM2.5 standard is met if the three-year average of the annual average PM2.5 concentration is less than or equal to the standard. Table 5 lists the attainment status for the criteria pollutants in the basin.

Table 5: South Coast Air Basin Attainment Status

Pollutant	Standard[1]	Averaging Time	Designation[2]	Attainment Date[3]
1-Hour Ozone	NAAQS	1979 1-Hour (0.12 ppm)	Nonattainment (Extreme)	2/6/2023 (not attained)[4]
	CAAQS	1-Hour (0.09 ppm)	Nonattainment	N/A
8-Hour Ozone[5]	NAAQS	1997 8-Hour (0.08 ppm)	Nonattainment (Extreme)	6/15/2024
	NAAQS	2008 8-Hour (0.075 ppm)	Nonattainment (Extreme)	7/20/2032
	NAAQS	2015 8-Hour (0.070 ppm)	Nonattainment (Extreme)	8/3/2038
	CAAQS	8-Hour (0.070 ppm)	Nonattainment	Beyond 2032
CO	NAAQS	1-Hour (35 ppm)	Attainment (Maintenance)	6/11/2007 (attained)
	CAAQS	8-Hour (9 ppm)	Attainment	6/11/2007 (attained)
NO_2 [6]	NAAQS	1-Hour (0.1 ppm)	Unclassifiable/Attainment	N/A (attained)
	NAAQS	Annual (0.053 ppm)	Attainment (Maintenance)	9/22/1998 (attained)
	CAAQS	1-hour (0.18 ppm) Annual (0.030 ppm)	Attainment	-
SO_2[7]	NAAQS	1-Hour (75 ppb)	Designations Pending (expect Uncl./Attainment)	N/A (attained)
	NAAQS	24-Hour (0.14 ppm) Annual (0.03 ppm)	Unclassifiable/Attainment	3/19/1979 (attained)
PM10	NAAQS	1987 24-Hour (150 µg/m^3)	Attainment (Maintenance)[8]	7/26/2013 (attained)
	CAAQS	24-Hour (50 µg/m^3) Annual (20 µg/m^3)	Nonattainment	N/A
PM2.5 [9]	NAAQS	2006 24-Hour (35 µg/m^3)	Nonattainment (Serious)	12/31/2019

Pollutant	Standard[1]	Averaging Time	Designation[2]	Attainment Date[3]
	NAAQS	1997 Annual (15.0 µg/m^3)	Attainment	8/24/2016
	NAAQS	2021 Annual (12.0 µg/m^3)	Nonattainment (Serious)	12/31/2025
	CAAQS	Annual (12.0 µg/m^3)	Nonattainment	N/A
Lead	NAAQS	3-Months Rolling (0.15 µg/m^3)	Nonattainment (Partial)[10]	12/31/2015

Notes:
Source: http://www.aqmd.gov/docs/default-source/clean-air-plans/air-quality-management-plans/naaqs-caaqs-feb2016.pdf
[1] NAAQS = National Ambient Air Quality Standards, CAAQS = California Ambient Air Quality Standards
[2] U.S. EPA often only declares Nonattainment areas; everywhere else is listed as Unclassifiable/Attainment or Unclassifiable.
[3] A design value below the NAAQS for data through the full year or smog season prior to the attainment date is typically required for attainment demonstration.
[4] 1-hour O3 standard (0.12 ppm) was revoked, effective June 15, 2005; however, the Basin has not attained this standard based on 2008-2010 data and is still subject to anti-backsliding requirements.
[5] 1997 8-hour O3 standard (0.08 ppm) was reduced (0.075 ppm), effective May 27, 2008; the revoked 1997 O3 standard is still subject to anti-backsliding requirements.
[6] New NO2 1-hour standard, effective August 2, 2010; attainment designations January 20, 2012; annual NO2 standard retained.
[7] The 1971 annual and 24-hour SO2 standards were revoked, effective August 23, 2010; however, these 1971 standards will remain in effect until one year after U.S. EPA promulgates area designations for the 2010 SO2 1-hour standard. Area designations are still pending, with Basin expected to be designated Unclassifiable /Attainment.
[8] Annual PM10 standard was revoked, effective December 18, 2006; 24-hour PM10 NAAQS deadline was 12/31/2006; SCAQMD request for attainment redesignation and PM10 maintenance plan was approved by U.S. EPA on June 26, 2013, effective July 26, 2013.
[9] Attainment deadline for the 2006 24-Hour PM2.5 NAAQS (designation effective December 14, 2009) is December 31, 2019 (end of the 10th calendar year after effective date of designations for Serious nonattainment areas). Annual PM2.5 standard was revised on January 15, 2013, effective March 18, 2013, from 15 to 12 µg/m3. Designations effective April 15, 2015, so Serious area attainment deadline is December 31, 2025.
[10] Partial Nonattainment designation – Los Angeles County portion of Basin only for near-source monitors. Expect redesignation to attainment based on current monitoring data.

3.2 Greenhouse Gases

Constituent gases of the Earth's atmosphere, called atmospheric greenhouse gases (GHG), play a critical role in the Earth's radiation amount by trapping infrared radiation emitted from the Earth's surface, which otherwise would have escaped to space. Prominent greenhouse gases contributing to this process include carbon dioxide (CO_2), methane (CH_4), ozone, water vapor, nitrous oxide (N_2O), and chlorofluorocarbons (CFCs). This phenomenon, known as the Greenhouse Effect, is responsible for maintaining a habitable climate. Anthropogenic (caused or produced by humans) emissions of these greenhouse gases in excess of natural ambient concentrations are responsible for the enhancement of the Greenhouse Effect and have led to a trend of unnatural warming of the Earth's natural climate, known as global warming or climate change. Emissions of gases that induce global warming are attributable to human activities associated with industrial/manufacturing, agriculture, utilities, transportation, and residential land uses. Transportation is responsible for 41 percent of the State's greenhouse gas emissions, followed by electricity generation. Emissions of CO_2 and nitrous oxide (NO_2) are byproducts of fossil fuel combustion. Methane, a potent greenhouse gas, results from off-gassing associated with agricultural practices and landfills. Sinks of CO_2, where CO_2 is stored outside of the atmosphere, include uptake by vegetation and dissolution into the ocean. Table 6 provides a description of each of the greenhouse gases and their global warming potential.

Additional information is available: https://www.arb.ca.gov/cc/inventory/data/data.htm

Table 6: Description of Greenhouse Gases

Greenhouse Gas	Description and Physical Properties	Sources
Nitrous oxide	Nitrous oxide (N_20),also known as laughing gas is a colorless gas. It has a lifetime of 114 years. Its global warming potential is 298.	Microbial processes in soil and water, fuel combustion, and industrial processes. In addition to agricultural sources, some industrial processes (nylon production, nitric acid production) also emit N_20.
Methane	Methane (CH_4) is a flammable gas and is the main component of natural gas. It has a lifetime of 12 years. Its global warming potential is 25.	A natural source of CH_4 is from the decay of organic matter. Methane is extracted from geological deposits (natural gas fields). Other sources are from the decay of organic material in landfills, fermentation of manure, and cattle farming.
Carbon dioxide	Carbon dioxide (CO_2) is an odorless, colorless, natural greenhouse gas. Carbon dioxide's global warming potential is 1. The concentration in 2005 was 379 parts per million (ppm), which is an increase of about 1.4 ppm per year since 1960.	Natural sources include decomposition of dead organic matter; respiration of bacteria, plants, animals, and fungus; evaporation from oceans; and volcanic outgassing. Anthropogenic sources are from burning coal, oil, natural gas, and wood.
Chlorofluorocarbons	CFCs are nontoxic, nonflammable, insoluble, and chemically unreactive in the troposphere (the level of air at the earth's surface). They are gases formed synthetically by replacing all hydrogen atoms in methane or methane with chlorine and/or fluorine atoms. Global warming potentials range from 3,800 to 8,100.	Chlorofluorocarbons were synthesized in 1928 for use as refrigerants, aerosol propellants, and cleaning solvents. They destroy stratospheric ozone, therefore their production was stopped as required by the Montreal Protocol.
Hydrofluorocarbons	Hydrofluorocarbons (HFCs) are a group of greenhouse gases containing carbon, chlorine, and at least one hydrogen atom. Global warming potentials range from 140 to 11,700.	Hydrofluorocarbons are synthetic manmade chemicals used as a substitute for chlorofluorocarbons in applications such as automobile air conditioners and refrigerants.
Perfluorocarbons	Perfluorocarbons (PFCs) have stable molecular structures and only break down by ultraviolet rays about 60 kilometers above the Earth's surface. They have a lifetime 10,000 to 50,000 years. They have a global warming potential range of 6,200 to 9,500.	Two main sources of perfluorocarbons are primary aluminum production and semiconductor manufacturing.
Sulfur hexafluoride	Sulfur hexafluoride (SF_6) is an inorganic, odorless, colorless, and nontoxic, nonflammable gas. It has a lifetime of 3,200 years. It has a high global warming potential, 23,900.	This gas is manmade and used for insulation in electric power transmission equipment, in the magnesium industry, in semiconductor manufacturing, and as a tracer gas for leak detection.

Notes:

1. Sources: Intergovernmental Panel on Climate Change 2014a and Intergovernmental Panel on Climate Change 2014b. https://www.ipcc.ch/publications_and_data/ar4/wg1/en/ch2s2-10-2.html

4.0 Modeling Parameters and Assumptions

4.1 Construction

Typical emission rates from construction activities were obtained from CalEEMod Version 2022.1.1.26 CalEEMod is a computer model published by the SCAQMD for estimating air pollutant emissions. The CalEEMod program uses the EMFAC2017 computer program to calculate the emission rates specific for the southwestern portion of San Bernardino County for construction-related employee vehicle trips and the OFFROAD2011 computer program to calculate emission rates for heavy truck operations. EMFAC2017 and OFFROAD2011 are computer programs generated by CARB that calculates composite emission rates for vehicles. Emission rates are reported by the program in grams per trip and grams per mile or grams per running hour. Using CalEEMod, the peak daily air pollutant emissions were calculated and presented below. These emissions represent the highest level of emissions for each of the construction phases in terms of air pollutant emissions.

The analysis assesses the emissions associated with the construction of the proposed Project as indicated in Table 1. Construction is estimated as beginning in February 2023 and finishing in January 2031. The phases of the construction activities which have been analyzed below are: 1) demolition, 2) site preparation, 3) grading, 4) building, 5) paving, and 6) architectural coating. For details on construction modeling and construction equipment for each phase, please see Appendix A.

The Project will be required to comply with existing SCAQMD rules for the reduction of fugitive dust emissions. SCAQMD Rule 403 establishes these procedures. Compliance with this rule is achieved through application of standard best management practices in construction and operation activities, such as application of water or chemical stabilizers to disturbed soils, managing haul road dust by application of water, covering haul vehicles, restricting vehicle speeds on unpaved roads to 15 mph, sweeping loose dirt from paved site access roadways, cessation of construction activity when winds exceed 25 mph and establishing a permanent, stabilizing ground cover on finished sites. In addition, projects that disturb 50 acres or more of soil or move 5,000 cubic yards of materials per day will be required to submit a Fugitive Dust Control Plan or a Large Operation Notification Form to SCAQMD.

SCAQMD's Rule 403 minimum requirements require that the application of the best available dust control measures are used for all grading operations and include the application of water or other soil stabilizers in sufficient quantity to prevent the generation of visible dust plumes. Compliance with Rule 403 would require the use of water trucks during all phases where earth moving operations would occur. Compliance with Rule 403 is required for all future projects.

4.2 Operations

Operational or long-term emissions occur over the life of the Project. Both mobile and area sources generate operational emissions. Area source emissions arise from consumer product usage, heaters that consume natural gas, gasoline-powered landscape equipment, and architectural coatings (painting). Mobile source emissions from motor vehicles are the largest single long-term source of air pollutants from the operation of the Project. Small amounts of emissions would also occur from area sources such

as the consumption of natural gas for heating, from landscaping emissions, and consumer product usage. The operational emissions were estimated using the latest version of CalEEMod.

Mobile Sources

Mobile sources include emissions from the additional vehicle miles generated from the proposed Project. The vehicle trips associated with the proposed Project are based upon the trip generation rates give in the Project-specific trip generation analysis (Linscott, Law & Greenspan, Engineers) which uses the Institute of Transportation Engineers (ITE) Trip Generation Manual 11th Edition. The trip generation analysis shows a net trip generation rate of 14,042 trips per day for the proposed Project.

The program then applies the emission factors for each trip which is provided by the EMFAC2017 model to determine the vehicular traffic pollutant emissions. The CalEEMod default trip lengths were used in this analysis. Please see CalEEMod output comments sections in Appendix A and B for details.

Area Sources

Area sources include emissions from consumer products, landscape equipment and architectural coatings. Landscape maintenance includes fuel combustion emissions from equipment such as lawn mowers, rototillers, shredders/grinders, blowers, trimmers, chain saws, and hedge trimmers, as well as air compressors, generators, and pumps. As specifics were not known about the landscaping equipment fleet, CalEEMod defaults were used to estimate emissions from landscaping equipment.

Per SCAQMD Rule 1113 as amended on June 3, 2011, the architectural coatings that would be applied after January 1, 2014 will be limited to an average of 50 grams per liter or less for buildings and 100 grams per liter or less for parking lot striping. No changes were made to the CalEEMod architectural coating default values.

Per AB 341, at least 75 percent of generated waste will be source reduced, recycled, or composted. This is shown in the CalEEMod model as a mitigation measure; however, it is required.

Energy Usage

2022.1.1.26 CalEEMod defaults were utilized.

4.3 Localized Analysis

Localized Significance Thresholds (LSTs) are the amount of project-related emissions at which localized concentrations could exceed the AAQS for criteria pollutants for which the South Coast Air Basin is designated nonattainment. SCAQMD LSTs to determine if emissions of NO2, CO, PM10, and PM2.5 generated at a project site (offsite mobile-source emissions are not included in the LST analysis) would expose sensitive receptors to substantial concentrations of criteria air pollutants. The SCAQMD has published a “Fact Sheet for Applying CalEEMod to Localized Significance Thresholds” (South Coast Air Quality Management District 2011b).

Per the LST methodology, information regarding specific development projects and the location of receptors would be need in order to quantify the levels of impact associated with future development

projects. Thus, as the General Plan is a plan level analysis, it is not possible to calculate individual project-related localized emissions at this time. Air quality emissions would be addressed on a project-by-project basis as individual development projects are considered.

Furthermore, in accordance with SCAQMD's LST methodology, construction LSTs are based on the acreage disturbed per day based on equipment use. However, as discussed above, an LST analysis for construction-related localized impacts can only be conducted at a project level, and quantification of LSTs is not applicable for this program-level analysis.

LST analysis is applicable to projects to five acres and less and can be used as a screening criterion for larger projects to determine whether or not dispersion modeling may be required. However, according to SCAQMD LST methodology, LSTs would apply to the operational phase of a project, if the project includes stationary sources, or attracts mobile sources (such as heavy-duty trucks) that may spend long periods queuing and idling at the site; such as industrial warehouse/transfer facilities. The future development accommodated by the General Plan includes only an increased number of residential uses and does not include such uses. Therefore, due to the lack of stationary source emissions, no long-term localized significance threshold analysis is to be warranted for the future individual project.

Therefore, as future development associated with the General Plan could exceed SCAQMD regional significance thresholds for construction, in accordance with SCAQMD methodology, it may also result in significant construction-related localized impacts. However, due to the nature of the planned development, operational localized significance thresholds are considered less than significant.

5.0 Thresholds of Significance

5.1 Air Quality Thresholds of Significance

5.1.1 CEQA Guidelines for Air Quality

The CEQA Guidelines define a significant effect on the environment as "a substantial, or potentially substantial, adverse change in the environment." To determine if a project would have a significant impact on air quality, the type, level, and impact of emissions generated by the project must be evaluated.

The following air quality significance thresholds are contained in Appendix G of the CEQA Guidelines. A significant impact would occur if the project would:

a) Conflict with or obstruct implementation of the applicable air quality plan;

b) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is nonattainment under an applicable national or state ambient air quality standard;

c) Expose sensitive receptors to substantial pollutant concentrations; or

d) Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people.

While the final determination of whether a project is significant is within the purview of the Lead Agency pursuant to Section 15064(b) of the CEQA Guidelines, SCAQMD recommends that its quantitative air pollution thresholds be used to determine the significance of project emissions. If the Lead Agency finds that the project has the potential to exceed these air pollution thresholds, the project should be considered to have significant air quality impacts. There are daily emission thresholds for construction and operation of a proposed project in the basin.

5.1.2 Regional Significance Thresholds for Construction Emissions

The following CEQA significance thresholds for construction emissions are established for the Basin:

- 75 pounds per day (lbs/day) of VOC
- 100 lbs/day of NO_x
- 550 lbs/day of CO
- 150 lbs/day of PM10
- 55 lbs/day of PM2.5
- 150 lbs/day of SO_2

Projects in the basin with construction-related emissions that exceed any of the emission thresholds are considered to be significant under SCAQMD guidelines.

5.1.3 Regional Significance Thresholds for Operational Emissions

The daily operational emissions significance thresholds for the basin are as follows:

- 55 pounds per day (lbs/day) of VOC
- 55 lbs/day of NO_x
- 550 lbs/day of CO
- 150 lbs/day of PM10
- 55 lbs/day of PM2.5
- 150 lbs/day of SO_2

Local Microscale Concentration Standards The significance of localized project impacts under CEQA depends on whether ambient CO levels in the vicinity of the project are above or below State and federal CO standards. If ambient levels are below the standards, a project is considered to have a significant impact if project emissions result in an exceedance of one or more of these standards. If ambient levels already exceed a State or federal standard, project emissions are considered significant if they increase 1-hour CO concentrations by 1.0 ppm or more or 8-hour CO concentrations by 0.45 ppm or more. The following are applicable local emission concentration standards for CO:

- California State 1-hour CO standard of 20.0 ppm
- California State 8-hour CO standard of 9.0 ppm

5.2 Greenhouse Gas Thresholds of Significance

5.2.1 CEQA Guidelines for Greenhouse Gas

CEQA Guidelines define a significant effect on the environment as "a substantial, or potentially substantial, adverse change in the environment." To determine if a project would have a significant impact on greenhouse gases, the type, level, and impact of emissions generated by the project must be evaluated.

The following greenhouse gas significance thresholds are contained in Appendix G of the CEQA Guidelines, which were amendments adopted into the Guidelines on March 18, 2010, pursuant to SB 97. A significant impact would occur if the project would:

(a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment; or

(b) Conflict with any applicable plan, policy or regulation of an agency adopted for the purpose of reducing the emissions of greenhouse gases.

However, despite this, currently neither the CEQA statutes, OPR guidelines, nor the draft proposed changes to the CEQA Guidelines prescribe thresholds of significance or a particular methodology for performing an impact analysis; as with most environmental topics, significance criteria are left to the judgment and discretion of the Lead Agency. As previously discussed (Section 2.2.4 of this report), SCAQMD has drafted interim thresholds. The screening threshold of 4.1 MTCO2e per service population per year for all land uses was used in this analysis.

5.3 Toxic Air Contaminants

The threshold for toxic air contaminants (TACs) has a maximum incremental cancer risk of 10 per million and a non-cancer (acute and chronic) hazard index of 1.0 or greater. An exceedance to these values for an individual project would be considered a significant impact.

6.0 Air Quality Emissions Impact

6.1 Construction Air Quality Emissions Impact

The latest version of CalEEMod was used to estimate the onsite and offsite construction emissions. The emissions incorporate Rule 402 and 403. Rule 402 and 403 (fugitive dust) are not considered mitigation measures as the Project by default is required to incorporate these rules during construction.

6.1.1 Regional Construction Emissions

The construction emissions for the Project would exceed the SCAQMD's daily emission thresholds at the regional level VOC emissions but would not exceed any other calculated pollutant as demonstrated in Table 7, and therefore would be considered significant without mitigation.

Table 7: Regional Significance – Unmitigated Construction Emissions (pounds/day)

Activity	Pollutant Emissions (pounds/day)					
	VOC	NOx	CO	SO_2	PM10	PM2.5
Maximum Daily Emissions	**170.00**	**39.84**	**186.20**	**0.09**	**29.08**	**7.37**
SCAQMD Thresholds	**75**	**100**	**550**	**150**	**150**	**55**
Exceeds Thresholds	**Yes**	No	No	No	No	No

Notes:
[1] Source: CalEEMod Version 2022.1.1.26. Complete output is provided in Appendix A.

However, with implementation of Mitigation Measure AQ-1 limiting residential architectural coatings to a VOC content of 20 grams per liter, the project would be below all thresholds and there less than significant with mitigation, shown below in Table 8.

Table 8: Regional Significance – Mitigated Construction Emissions (pounds/day)

Activity	Pollutant Emissions (pounds/day)					
	VOC	NOx	CO	SO_2	PM10	PM2.5
Total of overlapping phases[4]	**68.88**	**39.84**	**186.20**	**0.09**	**29.08**	**7.37**
SCAQMD Thresholds	**75**	**100**	**550**	**150**	**150**	**55**
Exceeds Thresholds	No	No	No	No	No	No

Notes:
[1] Source: CalEEMod Version 2022.1.1.26. Complete output is provided in Appendix B.

6.1.3 Localized Construction Emissions

Regarding health effects related to criteria pollutant emissions, the applicable significance thresholds are established for regional compliance with the state and federal ambient air quality standards, which are intended to protect public health from both acute and long-term health impacts, depending on the potential effects of the pollutant.

An LST analysis for construction-related localized impacts can only be conducted at a project level, and quantification of LSTs requires specific project-level information that is not available for this Program SEIR. Accordingly, new development resulting from the GPU could potentially exceed SCAQMD construction LSTs. Future developments within the project area will be required to perform analyses to determine individual project impacts and have the potential to cause a significant impact. Therefore, significant adverse acute health impacts could occur as a result of Project construction.

6.1.4 Odors

Potential sources that may emit odors during construction activities include the application of materials such as asphalt pavement. The objectionable odors that may be produced during the construction process are of short-term in nature and the odor emissions are expected cease upon the drying or hardening of the odor producing materials. Diesel exhaust and VOCs would be emitted during construction of the Project, which are objectionable to some; however, emissions would disperse rapidly from individual project sites. Due to the short-term nature and limited amounts of odor producing materials being utilized, no significant impact related to odors would occur during construction of the proposed Project.

The SCAQMD recommends that odor impacts be addressed in a qualitative manner. Such an analysis shall determine whether the Project would result in excessive nuisance odors, as defined under the California Code of Regulations and Section 41700 of the California Health and Safety Code, and thus would constitute a public nuisance related to air quality. Through required compliance with SCAQMD's Rule 402 for all future developments, no significant impact related to odors would occur during the on-going operations of the proposed Project.

6.1.5 Construction-Related Toxic Air Contaminant Impact

The greatest potential for toxic air contaminant emissions would be related to diesel particulate emissions associated with heavy equipment operations during construction of the proposed Project. The Office of Environmental Health Hazard Assessment (OEHHA) has issued the Air Toxic Hot Spots Program Risk Assessment Guidelines and Guidance Manual for the Preparation of Health Risk Assessments, February 2015 to provide a description of the algorithms, recommended exposure variates, cancer and noncancer health values, and the air modeling protocols needed to perform a health risk assessment (HRA) under the Air Toxics Hot Spots Information and Assessment Act of 1987. Hazard identification includes identifying all substances that are evaluated for cancer risk and/or non-cancer acute, 8-hour, and chronic health impacts. In addition, identifying any multi-pathway substances that present a cancer risk or chronic non-cancer hazard via non-inhalation routes of exposure.

Future developments within the project area will be required to perform analyses to determine individual project impacts and have the potential to cause a significant impact. Therefore, significant adverse acute health impacts could occur as a result of Project construction.

6.2 Operational Air Quality Emissions Impact

6.2.1 Regional Operational Emissions

The operations-related criteria air quality impacts created by the proposed Project have been analyzed through the use of CalEEMod model. The operating emissions were based on year 2040. The summer and winter emissions created by the proposed Project's long-term operations were calculated and the highest emissions from either summer or winter are summarized in Table 9.

Table 9: Regional Significance - Unmitigated Operational Emissions (lbs/day)

Activity	Pollutant Emissions (pounds/day)[1]					
	VOC	NOx	CO	SO2	PM10	PM2.5
Total Emissions	**115.00**	**39.15**	**493.48**	**1.06**	**107.39**	**28.19**
SCAQMD Thresholds	**55**	**55**	**550**	**150**	**150**	**55**
Exceeds Threshold?	**Yes**	No	No	No	No	No

Notes:
[1] Source: CalEEMod Version 2022.1.1.26. Complete output is provided in Appendix A.
[2] Area sources consist of emissions from consumer products, architectural coatings, and landscaping equipment.
[3] Energy usage consists of emissions from on-site natural gas usage.
[4] Mobile sources consist of emissions from vehicles and road dust.

Table 9 provides the Project's unmitigated operational emissions. Table 9 shows that the Project would exceed the SCAQMD daily emission threshold for VOC emissions. Table 10 below provides the Project's emissions with implementation of Mitigation Measure AQ-1 limiting residential architectural coatings to a VOC content of 20 grams per liter. With mitigation, the Project would still exceed the threshold for VOC emissions and would therefore have a significant and unavoidable impact.

Table 10: Regional Significance - Mitigated Operational Emissions (lbs/day)

Activity	Pollutant Emissions (pounds/day)[1]					
	VOC	NOx	CO	SO2	PM10	PM2.5
Total Emissions	**112.32**	**39.15**	**493.48**	**1.06**	**107.39**	**28.19**
SCAQMD Thresholds	**55**	**55**	**550**	**150**	**150**	**55**
Exceeds Threshold?	**Yes**	No	No	No	No	No

Notes:
[1] Source: CalEEMod Version 2022.1.1.26. Complete output is provided in Appendix B.
[2] Area sources consist of emissions from consumer products, architectural coatings, and landscaping equipment.
[3] Energy usage consists of emissions from on-site natural gas usage.
[4] Mobile sources consist of emissions from vehicles and road dust.

6.2.3 Localized Operational Emissions

Project-related air emissions from on-site sources such as architectural coatings, landscaping equipment, on-site usage of natural gas appliances as well as the operation of vehicles on-site may have the potential to exceed the State and Federal air quality standards in the project vicinity, even though these pollutant emissions may not be significant enough to create a regional impact to the Air Basin.

As stated previously, according to SCAQMD LST methodology, LSTs would apply to the operational phase of a project, if the project includes stationary sources, or attracts mobile sources (such as heavy-duty trucks) that may spend long periods queuing and idling at the site; such as industrial warehouse/transfer facilities. The proposed project includes the updating of the general plan zoning under the Housing Element to include an increased number of residential uses and does not include such uses. Therefore, due to the lack of stationary source emissions, no long-term localized significance threshold analysis is warranted.

6.3 CO Hot Spot Emissions

CO is the pollutant of major concern along roadways because the most notable source of CO is motor vehicles. For this reason, CO concentrations are usually indicative of the local air quality generated by a roadway network and are used as an indicator of potential local air quality impacts. Local air quality impacts can be assessed by comparing future without and with Project CO levels to the State and Federal CO standards which were presented in above in Section 5.0.

To determine if the proposed Project could cause emission levels in excess of the CO standards discussed above in Section 5.0, a sensitivity analysis is typically conducted to determine the potential for CO "hot spots" at a number of intersections in the general Project vicinity. Because of reduced speeds and vehicle queuing, "hot spots" potentially can occur at high traffic volume intersections with a Level of Service E or worse.

Micro-scale air quality emissions have traditionally been analyzed in environmental documents where the air basin was a non-attainment area for CO. However, the SCAQMD has demonstrated in the CO attainment redesignation request to EPA that there are no "hot spots" anywhere in the air basin, even at intersections with much higher volumes, much worse congestion, and much higher background CO levels than anywhere in San Bernardino County. If the worst-case intersections in the air basin have no "hot spot" potential, any local impacts will be below thresholds.

The Project-specific trip generation analysis showed that withing the Project area, the maximum daily vehicle trip rate in 2040 with development of the Project would be 43,459 on Chino Hills Parkway, east of Carbon Canyon Road. The 1992 Federal Attainment Plan for Carbon Monoxide (1992 CO Plan) showed that an intersection which has a daily traffic volume of approximately 100,000 vehicles per day would not violate the CO standard. The volume of traffic at Project buildout would be well below 100,000 vehicles and below the necessary volume to even get close to causing a violation of the CO standard. Therefore, no CO "hot spot" modeling was performed and no significant long-term air quality impact is anticipated to local air quality with the on-going use of the proposed Project.

6.4 Cumulative Regional Air Quality Impacts

Cumulative projects include local development as well as general growth within the project area. However, as with most development, the greatest source of emissions is from mobile sources, which travel well out of the local area. Therefore, from an air quality standpoint, the cumulative analysis would extend beyond any local projects and when wind patterns are considered, would cover an even larger area. Accordingly, the cumulative analysis for the Project's air quality must be generic by nature.

The Project area is out of attainment for both ozone and PM10 particulate matter. Construction and operation of cumulative projects will further degrade the local air quality, as well as the air quality of the South Coast Air Basin. The greatest cumulative impact on the quality of regional air cell will be the incremental addition of pollutants mainly from increased traffic from residential, commercial, and industrial development and the use of heavy equipment and trucks associated with the construction of these projects. Air quality will be temporarily degraded during construction activities that occur separately or simultaneously. However, in accordance with the SCAQMD methodology, projects that do not exceed the SCAQMD criteria or can be mitigated to less than criteria levels are not significant and do not add to the overall cumulative impact.[3]

As discussed in the construction analysis above, Section 6.1, it is possible that some of the future development projects accommodated under the GPU could exceed relevant SCAQMD construction-related significance thresholds. Therefore, during short-term construction related activities, the GPU has the potential to cumulatively contribute to the nonattainment designations of the South Coast Air Basin for Ozone and particulate matter. Therefore, construction-related air quality impacts of the future development associated with the GPU could be significant. However, as the long-term emissions of the future development associated with the GPU would not exceed SCAQMD operational thresholds of significance the project is considered to not substantially cumulatively contribute to the nonattainment designations of the South Coast Air Basin.

6.5 Air Quality Compliance

The California Environmental Quality Act (CEQA) requires a discussion of any inconsistencies between a proposed project and applicable General Plans and Regional Plans (CEQA Guidelines Section 15125). The regional plan that applies to the proposed Project includes the SCAQMD Air Quality Management Plan (AQMP). Therefore, this section discusses any potential inconsistencies of the proposed Project with the AQMP.

The purpose of this discussion is to set forth the issues regarding consistency with the assumptions and objectives of the AQMP and discuss whether the proposed Project would interfere with the region's ability to comply with Federal and State air quality standards. If the decision-makers determine that the proposed Project is inconsistent, the lead agency may consider Project modifications or inclusion of mitigation to eliminate the inconsistency.

The SCAQMD CEQA Handbook states that "New or amended General Plan Elements (including land use zoning and density amendments), Specific Plans, and significant projects must be analyzed for consistency with the AQMP." Strict consistency with all aspects of the plan is usually not required. A

[3] SCAQMD. White Paper on Potential Control Strategies to Address Cumulative Impacts From Air Pollution. 2003. https://www.aqmd.gov/docs/default-source/Agendas/Environmental-Justice/cumulative-impacts-working-group/cumulative-impacts-white-paper.pdf?sfvrsn=2.

proposed Project should be considered to be consistent with the AQMP if it furthers one or more policies and does not obstruct other policies. The SCAQMD CEQA Handbook identifies two key indicators of consistency:

(1) Whether the Project will result in an increase in the frequency or severity of existing air quality violations or cause or contribute to new violations or delay timely attainment of air quality standards or the interim emission reductions specified in the AQMP.

(2) Whether the Project will exceed the assumptions in the AQMP in 2022 or increments based on the year of Project buildout and phase.

Both of these criteria are evaluated in the following sections.

A. Criterion 1 - Increase in the Frequency or Severity of Violations?

Based on the air quality modeling analysis contained in this Air Analysis in sections 6.1 and 6.2, short-term construction impacts with mitigation would not result in significant impacts based on the SCAQMD regional thresholds of significance; however, individual future developments would have the potential to cause a significant impact project. Furthermore, operational emissions would result in potentially significant impacts based on SCAQMD thresholds.

Therefore, the proposed Project is projected to potentially contribute to the exceedance of air pollutant concentration standards and be inconsistent with the AQMP for the first criterion.

B. Criterion 2 - Exceed Assumptions in the AQMP?

Consistency with the AQMP assumptions is determined by performing an analysis of the proposed Project with the assumptions in the AQMP. The emphasis of this criterion is to ensure that the analyses conducted for the proposed Project are based on the same forecasts as the AQMP. The 2022-2045 Regional Transportation/Sustainable Communities Strategy, prepared by SCAG, 2022, includes chapters on: the challenges in a changing region, creating a plan for our future, and the road to greater mobility and sustainable growth. These chapters currently respond directly to federal and state requirements placed on SCAG. Local governments are required to use these as the basis of their plans for purposes of consistency with applicable regional plans under CEQA. For this Project, the SCAG Regional Housing Needs Assessment (RHNA) defines the assumptions that are represented in the AQMP.

The RHNA allotted an additional 3,729 units to be added to the City in the 2021-2029 planning period. As the Project plans for 2,849 new units, of which 2,528 are lower income housing, the project would be within the assumptions of the RHNA and would be consistent with the AQMP for the second criterion.

Therefore, as Criterion 1 would not be met, the proposed Project would result in a potential inconsistency with the SCAQMD AQMP. Therefore, a potentially significant impact would occur.

7.0 Greenhouse Gas Impact Analysis

7.1 Greenhouse Gas Emissions Impact

Operational emissions occur over the life of the Project. The operational emissions for the Project are 22,579 metric tons of CO_2e ($MTCO_2e$) per year (see Table 11). Furthermore, as shown in Table 11, the Project's total emissions (with incorporation of amortized construction related GHG emissions) would be 23,490 $MTCO_2e$ per year, or 2.02 $MTCO_2e$ per service population per year. These emissions do not exceed the SCAQMD screening threshold of 4.1 $MTCO_2e$ per year. Furthermore, this is a reduction compared to emissions of 4.53 $MTCO_2e$ per service population per year from existing uses and the combined emissions will be reduced to 4.28 $MTCO_2e$ per service population per year, due to increased housing density which requires less energy and vehicle usage. Therefore, the Project's GHG emissions are considered to be less than significant.

Table 11: Opening Year Unmitigated Project-Related Greenhouse Gas Emissions

Category	Greenhouse Gas Emissions (Metric Tons/Year)[1]		
	Existing	**Project**	**Existing Plus Project**
Area Sources[2]	6,830.90	49.18	6,880.08
Energy Usage[3]	79,946.00	5,276.50	85,222.50
Mobile Sources[4]	371,413.00	16,162.00	387,575.00
Solid Waste[5]	7,355.00	672.32	8,027.32
Water[6]	9,155.00	418.57	9,573.57
Contruction[7]	-	911.43	8,102.00
Total Emissions	474,179.90	23,490.00	497,669.90
Population	104,659	11,601.39	116,260.00
Emissions per Capita	4.53	2.02	4.28
SCAQMD Draft Screening Threshold	4.1	4.1	4.1
Exceeds Threshold?	Yes	No	Yes

Notes:
[1] Source: CalEEMod Version 2022.1.1.26. Complete output is provided in Appendix A for the Project and Appendix C for existing uses.
[2] Area sources consist of GHG emissions from consumer products, architectural coatings, and landscape equipment.
[3] Energy usage consist of GHG emissions from electricity and natural gas usage.
[4] Mobile sources consist of GHG emissions from vehicles.
[5] Solid waste includes the CO_2 and CH_4 emissions created from the solid waste placed in landfills.
[6] Water includes GHG emissions from electricity used for transport of water and processing of wastewater.
[7] Construction GHG emissions based on a 30-year amortization rate.

7.2 Greenhouse Gas Plan Consistency

The proposed Project would have the potential to conflict with any applicable plan, policy or regulation of an agency adopted for the purpose of reducing the emissions of greenhouse gases.

The CARB 2017 Climate Change Scoping Plan is CARB's primary document used to ensure State GHG reduction goals are met. The plan identifies an increasing need for coordination among State, regional, and local governments to achieve the GHG emissions reductions that can be gained from local land use planning and decisions. Nearly all of the specific measures identified in the 2017 Climate Change Scoping Plan would be implemented at the state level, with CARB and/or another state or regional agency having the primary responsibility for achieving required GHG reductions. The Project, therefore, would have limited ability to directly conflict with any of the specific measures identified in the 2017 Climate Change Scoping Plan. Nonetheless, the overarching goal of the 2017 Climate Change Scoping Plan is to achieve a 40 percent reduction in GHG emissions below 1990 levels by the Year 2030. To achieve this statewide goal, the 2017 Climate Change Scoping Plan recommends a statewide efficiency metric of six metric tons per capita by 2030 and two metric tons per capita by 2050. These statewide per capita targets are based on the statewide GHG emissions inventory that includes all emissions sectors in the State. Under an unmitigated scenario as shown in Table 11, implementation of the proposed Project is estimated to result in a GHG emission efficiency of 4.28 $MTCO_2e$ per capita. Project growth would result in emissions that meet the 2017 Climate Change Scoping Plan adjusted statewide 2040 metric of four $MTCO_2e$ per capita employed for this EIR.[4]

[4] The Project plans for growth through Year 2040. Therefore, the 2040 statewide efficiency metric is linearly derived from the State's 2030 (6 $MTCO_2e$ per capita) and 2050 (2 $MTCO_2e$ per capita) targets.

8.0 CEQA Analysis

The California Environmental Quality Act Guidelines (Appendix D) establishes thresholds for air quality, greenhouse gas, and energy impact analyses as presented below:

Air Quality

Where available, the significance criteria established by the applicable air quality management district or air pollution control district may be relied upon to make the following determinations. Would the project:

(a) Conflict with or obstruct implementation of the applicable air quality plan?

The regional plan that applies to the proposed project includes the SCAQMD Air Quality Management Plan (AQMP). A proposed project should be considered to be consistent with the AQMP if it furthers one or more policies and does not obstruct other policies. The SCAQMD CEQA Handbook identifies two key indicators of consistency:

(1) Whether the project will result in an increase in the frequency or severity of existing air quality violations or cause or contribute to new violations or delay timely attainment of air quality standards or the interim emission reductions specified in the AQMP.

(2) Whether the project will exceed the assumptions in the AQMP in 2022 or increments based on the year of project buildout and phase.

As discussed in section 6, this air quality analysis finds that short-term construction impacts with mitigation would not result in significant impacts based on the SCAQMD regional thresholds of significance. However, operational emissions would result in potentially significant impacts based on SCAQMD thresholds. **Mitigation Measure AQ-1** has been implemented to limit residential architectural coatings to a VOC content of 20 grams per liter; however, the project would still exceed the threshold for VOC emissions with mitigation. Therefore, due to inconsistency with criterion 1, a **potentially significant** impact would occur.

The project would be consistent with the assumptions of the RHNA, which defines the assumptions that are represented in the AQMP and would therefore be consistent with criterion 2.

(b) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard?

In accordance with the SCAQMD methodology, projects that do not exceed the SCAQMD criteria or can be mitigated to less than criteria levels are not significant and do not add to the overall cumulative impact. As discussed in section 6.4, future developments within the Project have the potential to exceed the thresholds of significance with inclusion of Mitigation Measure AQ-1 and the Project is therefore **potentially significant**.

(c) Expose sensitive receptors to substantial pollutant concentrations?

As discussed in section 6, the project would potentially exceed operational localized emissions thresholds set by the SCAQMD with inclusion of Mitigation Measure AQ-1 and would therefore have a **potentially significant** impact on sensitive receptors.

(d) Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?

As discussed in section 6.1.4, potential sources that may emit odors during the on-going operations of the proposed project would include odor emissions from vehicle emissions. Through compliance with SCAQMD's Rule 402 **no significant impact** related to odors would occur during the on-going operations of the proposed project. Furthermore, the project would **not be a significant source** of toxic air contaminants during construction or operation, as discussed in sections 6.1.5 and 6.2.3.

Greenhouse Gas Emissions

Would the project:

a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?

As discussed in section 7.2, combined project emissions from construction and operation would not exceed SCAQMD screening threshold of 4.1 metric tons of CO_2e per service population per year. Therefore, the project's GHG emissions are considered to be **less than significant**.

b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?

As discussed in section 7.2, implementation of the proposed Project is estimated to result in a GHG emission efficiency of 2.02 MTCO2e per capita, which would reduce the cumulative efficiency from 4.53 MTCO2e to 4.28 MTCO2e per capita. Project growth would result in emissions that meet the CARB 2017 Climate Change Scoping Plan adjusted statewide 2040 metric of four MTCO2e per capita employed for this analysis. Therefore, the project would be consistent with the Scoping Plan and would have a **less than significant** impact.

9.0 References

The following references were used in the preparing this analysis.

California Air Pollution Control Officers Association
2009 Health Risk Assessments for Proposed Land Use Projects

California Air Resources Board
2008 Resolution 08-43

2008 Recommended Approaches for Setting Interim Significance Thresholds for Greenhouse Gases under the California Environmental Quality Act

2008 ARB Recommended Interim Risk Management Policy for Inhalation-Based Residential Cancer Risk – Frequently Asked Questions

2008 Climate Change Scoping Plan, a framework for change.

2011 Supplement to the AB 32 Scoping Plan Functional Equivalent Document

2013 Revised Emission Factors for Gasoline Marketing Operations at California Gasoline Dispensing Facilities

2014 First Update to the Climate Change Scoping Plan, Building on the Framework Pursuant to AB32, the California Global Warming Solutions Act of 2006. May.

2018 Historical Air Quality, Top 4 Summary

City of Chino Hills
2015 City of Chino Hills General Plan, February 24.

County of San Bernardino
2007 County of San Bernardino 2007 General Plan, March 13 (amended April 24, 2014).

2011 County of San Bernardino Greenhouse Gas Emissions Reduction Plan.

Governor's Office of Planning and Research
2008 CEQA and Climate: Addressing Climate Change Through California Environmental Quality Act (CEQA) Review

2009 CEQA Guideline Sections to be Added or Amended

Office of Environmental Health Hazard Assessment

2015 Air Toxics Hot Spots Program Risk Assessment Guidelines

South Coast Air Quality Management District

1993 CEQA Air Quality Handbook

2005 Rule 403 Fugitive Dust

2007 2007 Air Quality Management Plan

2008 Final Localized Significance Threshold Methodology, Revised

2011 Appendix A Calculation Details for CalEEMod

2012 Final 2012 Air Quality Management Plan

2016 Final 2016 Air Quality Management Plan

2022 Final 2022 Air Quality Management Plan

Appendix A:

CalEEMod Unmitigated Project Emission Output

Chino Hills General Plan - Project Detailed Report

Table of Contents

1. Basic Project Information

1.1. Basic Project Information

1.2. Land Use Types

1.3. User-Selected Emission Reduction Measures by Emissions Sector

2. Emissions Summary

2.1. Construction Emissions Compared Against Thresholds

2.2. Construction Emissions by Year, Unmitigated

2.3. Construction Emissions by Year, Mitigated

2.4. Operations Emissions Compared Against Thresholds

2.5. Operations Emissions by Sector, Unmitigated

2.6. Operations Emissions by Sector, Mitigated

3. Construction Emissions Details

3.1. Demolition (2023) - Unmitigated

3.2. Demolition (2023) - Mitigated

3.3. Site Preparation (2023) - Unmitigated

3.4. Site Preparation (2023) - Mitigated

3.5. Grading (2023) - Unmitigated

3.6. Grading (2023) - Mitigated

3.7. Grading (2024) - Unmitigated

3.8. Grading (2024) - Mitigated

3.9. Building Construction (2024) - Unmitigated

3.10. Building Construction (2024) - Mitigated

3.11. Building Construction (2025) - Unmitigated

3.12. Building Construction (2025) - Mitigated

3.13. Building Construction (2026) - Unmitigated

3.14. Building Construction (2026) - Mitigated

3.15. Building Construction (2027) - Unmitigated

3.16. Building Construction (2027) - Mitigated

3.17. Building Construction (2028) - Unmitigated

3.18. Building Construction (2028) - Mitigated

3.19. Building Construction (2029) - Unmitigated

3.20. Building Construction (2029) - Mitigated

3.21. Building Construction (2030) - Unmitigated

3.22. Building Construction (2030) - Mitigated

3.23. Paving (2030) - Unmitigated

3.24. Paving (2030) - Mitigated

3.25. Architectural Coating (2030) - Unmitigated

3.26. Architectural Coating (2030) - Mitigated

3.27. Architectural Coating (2031) - Unmitigated

3.28. Architectural Coating (2031) - Mitigated

4. Operations Emissions Details

4.1. Mobile Emissions by Land Use

4.1.1. Unmitigated

4.1.2. Mitigated

4.2. Energy

4.2.1. Electricity Emissions By Land Use - Unmitigated

4.2.2. Electricity Emissions By Land Use - Mitigated

4.2.3. Natural Gas Emissions By Land Use - Unmitigated

4.2.4. Natural Gas Emissions By Land Use - Mitigated

4.3. Area Emissions by Source

4.3.1. Unmitigated

4.3.2. Mitigated

4.4. Water Emissions by Land Use

4.4.1. Unmitigated

4.4.2. Mitigated

4.5. Waste Emissions by Land Use

4.5.1. Unmitigated

4.5.2. Mitigated

4.6. Refrigerant Emissions by Land Use

4.6.1. Unmitigated

4.6.2. Mitigated

4.7. Offroad Emissions By Equipment Type

4.7.1. Unmitigated

4.7.2. Mitigated

4.8. Stationary Emissions By Equipment Type

4.8.1. Unmitigated

4.8.2. Mitigated

4.9. User Defined Emissions By Equipment Type

4.9.1. Unmitigated

4.9.2. Mitigated

4.10. Soil Carbon Accumulation By Vegetation Type

4.10.1. Soil Carbon Accumulation By Vegetation Type - Unmitigated

4.10.2. Above and Belowground Carbon Accumulation by Land Use Type - Unmitigated

4.10.3. Avoided and Sequestered Emissions by Species - Unmitigated

4.10.4. Soil Carbon Accumulation By Vegetation Type - Mitigated

4.10.5. Above and Belowground Carbon Accumulation by Land Use Type - Mitigated

4.10.6. Avoided and Sequestered Emissions by Species - Mitigated

5. Activity Data

5.1. Construction Schedule

5.2. Off-Road Equipment

5.2.1. Unmitigated

5.2.2. Mitigated

5.3. Construction Vehicles

5.3.1. Unmitigated

5.3.2. Mitigated

5.4. Vehicles

5.4.1. Construction Vehicle Control Strategies

5.5. Architectural Coatings

5.6. Dust Mitigation

5.6.1. Construction Earthmoving Activities

5.6.2. Construction Earthmoving Control Strategies

5.7. Construction Paving

5.8. Construction Electricity Consumption and Emissions Factors

5.9. Operational Mobile Sources

5.9.1. Unmitigated

5.9.2. Mitigated

5.10. Operational Area Sources

5.10.1. Hearths

5.10.1.1. Unmitigated

5.10.1.2. Mitigated

5.10.2. Architectural Coatings

5.10.3. Landscape Equipment

5.10.4. Landscape Equipment - Mitigated

5.11. Operational Energy Consumption

5.11.1. Unmitigated

5.11.2. Mitigated

5.12. Operational Water and Wastewater Consumption

5.12.1. Unmitigated

5.12.2. Mitigated

5.13. Operational Waste Generation

5.13.1. Unmitigated

5.13.2. Mitigated

5.14. Operational Refrigeration and Air Conditioning Equipment

5.14.1. Unmitigated

5.14.2. Mitigated

5.15. Operational Off-Road Equipment

5.15.1. Unmitigated

5.15.2. Mitigated

5.16. Stationary Sources

5.16.1. Emergency Generators and Fire Pumps

5.16.2. Process Boilers

5.17. User Defined

5.18. Vegetation

5.18.1. Land Use Change

5.18.1.1. Unmitigated

5.18.1.2. Mitigated

5.18.1. Biomass Cover Type

5.18.1.1. Unmitigated

5.18.1.2. Mitigated

5.18.2. Sequestration

5.18.2.1. Unmitigated

5.18.2.2. Mitigated

6. Climate Risk Detailed Report

6.1. Climate Risk Summary

6.2. Initial Climate Risk Scores

6.3. Adjusted Climate Risk Scores

6.4. Climate Risk Reduction Measures

7. Health and Equity Details

7.1. CalEnviroScreen 4.0 Scores

7.2. Healthy Places Index Scores

7.3. Overall Health & Equity Scores

7.4. Health & Equity Measures

7.5. Evaluation Scorecard

7.6. Health & Equity Custom Measures

8. User Changes to Default Data

1. Basic Project Information

1.1. Basic Project Information

Data Field	Value
Project Name	Chino Hills General Plan - Project
Construction Start Date	10/1/2024
Operational Year	2040
Lead Agency	—
Land Use Scale	Plan/community
Analysis Level for Defaults	County
Windspeed (m/s)	2.60
Precipitation (days)	18.8
Location	Chino Hills, CA, USA
County	San Bernardino-South Coast
City	Chino Hills
Air District	South Coast AQMD
Air Basin	South Coast
TAZ	5201
EDFZ	10
Electric Utility	Southern California Edison
Gas Utility	Southern California Gas
App Version	2022.1.1.29

1.2. Land Use Types

Land Use Subtype	Size	Unit	Lot Acreage	Building Area (sq ft)	Landscape Area (sq ft)	Special Landscape Area (sq ft)	Population	Description
Single Family Housing	207	Dwelling Unit	67.2	403,650	2,424,561	—	685	—

Apartments High Rise	2,207	Dwelling Unit	35.6	2,118,720	0.00	—	7,305	—
Condo/Townhouse	435	Dwelling Unit	27.2	461,100	0.00	—	1,440	—

1.3. User-Selected Emission Reduction Measures by Emissions Sector

Sector	#	Measure Title
Construction	C-2*	Limit Heavy-Duty Diesel Vehicle Idling
Construction	C-3	Use Local Construction Contractors
Construction	C-4*	Use Local and Sustainable Building Materials
Transportation	T-4	Integrate A ordable and Below Market Rate Housing
Transportation	T-19-B	Construct or Improve Bike Boulevard
Waste	S-1/S-2	Implement Waste Reduction Plan
Waste	S-4*	Recycle Demolished Construction Material
Area Sources	AS-1	Use Low-VOC Cleaning Supplies
Area Sources	AS-2	Use Low-VOC Paints

* Qualitative or supporting measure. Emission reductions not included in the mitigated emissions results.

2. Emissions Summary

2.1. Construction Emissions Compared Against Thresholds

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Un/Mit.	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	171	39.8	186	0.09	1.81	28.4	29.1	1.66	6.78	7.37	—	40,405	40,405	2.03	2.42	140	41,318
Mit.	171	39.8	117	0.09	1.81	16.6	17.2	1.66	3.99	5.63	—	27,493	27,493	1.66	2.05	88.1	28,235
% Reduced	< 0.5%	< 0.5%	37%	—	—	42%	41%	—	41%	24%	—	32%	32%	18%	15%	37%	32%

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	171	37.4	145	0.09	1.59	28.4	29.1	1.47	6.78	7.37	—	38,035	38,035	2.08	2.42	3.64	38,813
Mit.	171	37.4	96.9	0.09	1.59	16.6	17.2	1.47	3.99	4.59	—	26,218	26,218	1.70	2.05	2.29	26,874
% Reduced	< 0.5%	< 0.5%	33%	—	—	42%	41%	—	41%	38%	—	31%	31%	18%	15%	37%	31%
Average Daily (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	43.5	24.4	101	0.07	0.97	20.1	20.5	0.89	4.79	5.16	—	26,924	26,924	1.45	1.73	40.1	27,516
Mit.	43.5	22.2	66.9	0.07	0.97	11.7	12.1	0.89	2.83	3.20	—	18,541	18,541	1.18	1.47	25.4	19,033
% Reduced	< 0.5%	9%	34%	—	—	42%	41%	—	41%	38%	—	31%	31%	18%	15%	37%	31%
Annual (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	7.95	4.46	18.4	0.01	0.18	3.67	3.74	0.16	0.87	0.94	—	4,458	4,458	0.24	0.29	6.63	4,556
Mit.	7.93	4.05	12.2	0.01	0.18	2.14	2.21	0.16	0.52	0.58	—	3,070	3,070	0.20	0.24	4.21	3,151
% Reduced	< 0.5%	9%	34%	—	—	42%	41%	—	41%	38%	—	31%	31%	18%	15%	37%	31%

2.2. Construction Emissions by Year, Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Year	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily - Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2023	4.04	39.8	37.1	0.06	1.81	7.89	9.70	1.66	3.99	5.65	—	6,892	6,892	0.28	0.06	1.26	6,919
2024	11.8	34.4	186	0.09	1.45	28.4	29.1	1.33	6.78	7.37	—	40,405	40,405	2.03	2.42	140	41,318
2025	10.5	29.6	173	0.09	0.57	28.4	29.0	0.53	6.78	7.31	—	39,647	39,647	1.98	2.42	130	40,548
2026	9.80	27.6	161	0.09	0.52	28.4	29.0	0.49	6.78	7.26	—	38,920	38,920	1.91	2.38	118	39,795
2027	9.37	25.8	151	0.09	0.47	28.4	28.9	0.45	6.78	7.22	—	38,199	38,199	1.05	2.31	106	39,020

2028	8.98	24.9	141	0.09	0.44	28.4	28.9	0.34	6.78	7.12	—	37,482	37,482	0.97	2.31	94.7	38,289
2029	8.56	23.3	132	0.09	0.34	28.4	28.8	0.32	6.78	7.10	—	36,774	36,774	0.92	2.24	84.3	37,549
2030	171	6.32	22.4	0.01	0.22	5.17	5.18	0.20	1.21	1.22	—	5,195	5,195	0.06	0.19	12.0	5,265
Daily - Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2023	3.82	37.4	32.8	0.06	1.59	3.85	5.45	1.47	1.49	2.95	—	6,867	6,867	0.28	0.06	0.03	6,893
2024	11.2	34.4	145	0.09	1.45	28.4	29.1	1.33	6.78	7.37	—	38,035	38,035	2.08	2.42	3.64	38,813
2025	9.88	30.9	135	0.09	0.57	28.4	29.0	0.53	6.78	7.31	—	37,335	37,335	2.02	2.42	3.36	38,111
2026	9.22	28.9	126	0.09	0.52	28.4	29.0	0.49	6.78	7.26	—	36,663	36,663	1.14	2.42	3.05	37,417
2027	8.83	27.2	118	0.09	0.47	28.4	28.9	0.45	6.78	7.22	—	35,993	35,993	1.09	2.31	2.74	36,712
2028	8.53	25.4	110	0.09	0.44	28.4	28.9	0.34	6.78	7.12	—	35,323	35,323	1.02	2.31	2.46	36,039
2029	7.31	24.5	104	0.09	0.34	28.4	28.8	0.32	6.78	7.10	—	34,659	34,659	0.97	2.24	2.18	35,353
2030	171	23.1	98.2	0.09	0.33	28.4	28.8	0.31	6.78	7.08	—	34,006	34,006	0.89	2.24	1.94	34,698
2031	171	1.80	16.1	< 0.005	0.01	5.17	5.18	0.01	1.21	1.22	—	4,706	4,706	0.06	0.19	0.27	4,764
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2023	2.29	22.1	19.9	0.03	0.97	2.18	3.15	0.89	0.99	1.88	—	3,383	3,383	0.14	0.03	0.31	3,397
2024	6.39	24.4	83.5	0.06	0.62	15.1	15.7	0.58	3.70	4.28	—	20,902	20,902	1.11	1.24	30.8	21,330
2025	6.97	22.7	101	0.07	0.41	20.1	20.5	0.38	4.78	5.16	—	26,924	26,924	1.45	1.73	40.1	27,516
2026	6.59	21.3	93.9	0.07	0.37	20.1	20.4	0.35	4.78	5.13	—	26,437	26,437	0.82	1.73	36.3	27,009
2027	6.34	20.0	87.7	0.07	0.34	20.1	20.4	0.32	4.78	5.10	—	25,953	25,953	0.78	1.65	32.6	26,497
2028	6.08	18.8	83.0	0.07	0.31	20.1	20.4	0.25	4.79	5.04	—	25,538	25,538	0.73	1.66	29.3	26,079
2029	5.22	17.6	77.8	0.07	0.25	20.1	20.3	0.23	4.78	5.01	—	24,990	24,990	0.69	1.60	26.0	25,511
2030	43.5	6.24	24.6	0.02	0.12	5.99	6.12	0.11	1.42	1.54	—	7,413	7,413	0.18	0.43	6.69	7,551
2031	9.37	0.10	0.92	< 0.005	< 0.005	0.28	0.28	< 0.005	0.07	0.07	—	261	261	< 0.005	0.01	0.25	265
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2023	0.42	4.04	3.62	0.01	0.18	0.40	0.57	0.16	0.18	0.34	—	560	560	0.02	0.01	0.05	562
2024	1.17	4.46	15.2	0.01	0.11	2.75	2.86	0.11	0.68	0.78	—	3,460	3,460	0.18	0.21	5.10	3,531

2025	1.27	4.15	18.4	0.01	0.07	3.66	3.74	0.07	0.87	0.94	—	4,458	4,458	0.24	0.29	6.63	4,556
2026	1.20	3.89	17.1	0.01	0.07	3.66	3.73	0.06	0.87	0.94	—	4,377	4,377	0.14	0.29	6.01	4,472
2027	1.16	3.65	16.0	0.01	0.06	3.66	3.73	0.06	0.87	0.93	—	4,297	4,297	0.13	0.27	5.40	4,387
2028	1.11	3.42	15.1	0.01	0.06	3.67	3.73	0.05	0.87	0.92	—	4,228	4,228	0.12	0.27	4.86	4,318
2029	0.95	3.21	14.2	0.01	0.04	3.66	3.71	0.04	0.87	0.91	—	4,137	4,137	0.11	0.27	4.30	4,224
2030	7.95	1.14	4.49	< 0.005	0.02	1.09	1.12	0.02	0.26	0.28	—	1,227	1,227	0.03	0.07	1.11	1,250
2031	1.71	0.02	0.17	< 0.005	< 0.005	0.05	0.05	< 0.005	0.01	0.01	—	43.3	43.3	< 0.005	< 0.005	0.04	43.8

2.3. Construction Emissions by Year, Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Year	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily - Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2023	4.03	39.8	36.4	0.06	1.81	7.79	9.59	1.66	3.97	5.63	—	6,759	6,759	0.28	0.06	0.68	6,784
2024	10.7	34.3	117	0.09	1.45	16.6	17.2	1.33	3.99	4.59	—	27,493	27,493	1.66	2.05	88.1	28,235
2025	9.72	26.2	109	0.09	0.57	16.6	17.1	0.53	3.99	4.53	—	27,010	27,010	1.61	2.05	82.3	27,744
2026	9.06	24.7	102	0.09	0.52	16.6	17.1	0.49	3.99	4.48	—	26,540	26,540	1.54	2.01	74.9	27,253
2027	8.63	23.2	96.2	0.09	0.47	16.6	17.0	0.45	3.99	4.44	—	26,068	26,068	1.05	1.94	67.2	26,740
2028	8.24	22.3	90.3	0.09	0.44	16.6	17.0	0.34	3.99	4.34	—	25,581	25,581	0.97	1.94	60.1	26,244
2029	7.82	21.1	85.3	0.09	0.34	16.6	16.9	0.32	3.99	4.32	—	25,088	25,088	0.92	1.87	53.3	25,723
2030	171	6.30	13.7	0.01	0.22	2.79	2.80	0.20	0.65	0.66	—	2,898	2,898	0.06	0.11	6.48	2,940
Daily - Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2023	3.81	37.4	32.3	0.06	1.59	3.73	5.33	1.47	1.46	2.92	—	6,746	6,746	0.28	0.06	0.02	6,770
2024	10.1	34.4	96.9	0.09	1.45	16.6	17.2	1.33	3.99	4.59	—	26,218	26,218	1.70	2.05	2.29	26,874
2025	9.14	27.2	90.3	0.09	0.57	16.6	17.1	0.53	3.99	4.53	—	25,765	25,765	1.65	2.05	2.13	26,420
2026	8.48	25.6	84.8	0.09	0.52	16.6	17.1	0.49	3.99	4.48	—	25,325	25,325	1.14	2.05	1.94	25,968

2027	8.09	24.2	79.9	0.09	0.47	16.6	17.0	0.45	3.99	4.44	—	24,880	24,880	1.09	1.94	1.74	25,488
2028	7.79	22.8	75.1	0.09	0.44	16.6	17.0	0.34	3.99	4.34	—	24,419	24,419	1.02	1.94	1.56	25,024
2029	6.94	21.9	71.2	0.09	0.34	16.6	16.9	0.32	3.99	4.32	—	23,950	23,950	0.97	1.87	1.38	24,534
2030	171	20.9	67.5	0.09	0.33	16.6	16.9	0.31	3.99	4.30	—	23,478	23,478	0.89	1.87	1.23	24,060
2031	171	1.43	10.4	< 0.005	0.01	2.79	2.80	0.01	0.65	0.66	—	2,634	2,634	0.06	0.11	0.15	2,669
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2023	2.28	22.1	19.5	0.03	0.97	2.11	3.08	0.89	0.97	1.86	—	3,314	3,314	0.14	0.03	0.17	3,326
2024	5.82	22.2	57.3	0.06	0.62	9.08	9.71	0.58	2.30	2.89	—	14,800	14,800	0.92	1.05	19.3	15,157
2025	6.44	19.8	66.9	0.07	0.41	11.7	12.1	0.38	2.82	3.20	—	18,541	18,541	1.18	1.47	25.4	19,033
2026	6.06	18.6	62.7	0.07	0.37	11.7	12.1	0.35	2.82	3.16	—	18,223	18,223	0.82	1.47	23.1	18,704
2027	5.82	17.6	58.9	0.07	0.34	11.7	12.0	0.32	2.82	3.14	—	17,902	17,902	0.78	1.39	20.7	18,356
2028	5.55	16.6	55.9	0.07	0.31	11.7	12.0	0.25	2.83	3.07	—	17,618	17,618	0.73	1.39	18.6	18,069
2029	4.96	15.7	52.7	0.07	0.25	11.7	11.9	0.23	2.82	3.05	—	17,232	17,232	0.69	1.34	16.5	17,665
2030	43.5	5.76	17.5	0.02	0.12	3.44	3.56	0.11	0.82	0.94	—	5,087	5,087	0.18	0.34	4.11	5,198
2031	9.36	0.08	0.59	< 0.005	< 0.005	0.15	0.15	< 0.005	0.04	0.04	—	146	146	< 0.005	0.01	0.14	148
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2023	0.42	4.03	3.57	0.01	0.18	0.39	0.56	0.16	0.18	0.34	—	549	549	0.02	< 0.005	0.03	551
2024	1.06	4.05	10.5	0.01	0.11	1.66	1.77	0.11	0.42	0.53	—	2,450	2,450	0.15	0.17	3.20	2,509
2025	1.17	3.61	12.2	0.01	0.07	2.13	2.21	0.07	0.51	0.58	—	3,070	3,070	0.20	0.24	4.21	3,151
2026	1.11	3.40	11.4	0.01	0.07	2.13	2.20	0.06	0.51	0.58	—	3,017	3,017	0.14	0.24	3.82	3,097
2027	1.06	3.22	10.7	0.01	0.06	2.13	2.20	0.06	0.51	0.57	—	2,964	2,964	0.13	0.23	3.43	3,039
2028	1.01	3.04	10.2	0.01	0.06	2.14	2.20	0.05	0.52	0.56	—	2,917	2,917	0.12	0.23	3.08	2,992
2029	0.91	2.87	9.61	0.01	0.04	2.13	2.18	0.04	0.51	0.56	—	2,853	2,853	0.11	0.22	2.72	2,925
2030	7.93	1.05	3.20	< 0.005	0.02	0.63	0.65	0.02	0.15	0.17	—	842	842	0.03	0.06	0.68	861
2031	1.71	0.01	0.11	< 0.005	< 0.005	0.03	0.03	< 0.005	0.01	0.01	—	24.2	24.2	< 0.005	< 0.005	0.02	24.5

2.4. Operations Emissions Compared Against Thresholds

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Un/Mit.	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	115	39.2	493	1.06	1.31	106	107	1.27	26.9	28.2	1,388	135,635	137,023	145	4.91	78.3	142,190
Mit.	107	39.1	493	1.06	1.31	106	107	1.27	26.9	28.1	1,388	135,431	136,819	145	4.90	78.2	141,984
% Reduced	7%	< 0.5%	< 0.5%	< 0.5%	—	< 0.5%	< 0.5%	—	< 0.5%	< 0.5%	—	< 0.5%	< 0.5%	< 0.5%	< 0.5%	< 0.5%	< 0.5%
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	100	39.7	275	0.99	1.24	106	107	1.22	26.9	28.1	1,388	128,723	130,112	145	5.03	22.8	135,262
Mit.	92.3	39.7	275	0.99	1.24	106	107	1.22	26.9	28.1	1,388	128,533	129,921	145	5.03	22.8	135,068
% Reduced	8%	< 0.5%	< 0.5%	< 0.5%	—	< 0.5%	< 0.5%	—	< 0.5%	< 0.5%	—	< 0.5%	< 0.5%	< 0.5%	< 0.5%	< 0.5%	< 0.5%
Average Daily (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	109	41.1	396	1.01	1.29	105	106	1.25	26.6	27.9	1,388	130,022	131,410	145	5.07	46.0	136,593
Mit.	102	41.0	396	1.01	1.29	105	106	1.25	26.5	27.8	1,388	129,829	131,217	145	5.06	45.9	136,397
% Reduced	7%	< 0.5%	< 0.5%	< 0.5%	—	< 0.5%	< 0.5%	—	< 0.5%	< 0.5%	—	< 0.5%	< 0.5%	< 0.5%	< 0.5%	< 0.5%	< 0.5%
Annual (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	20.0	7.50	72.3	0.18	0.24	19.1	19.4	0.23	4.86	5.08	230	21,527	21,756	24.0	0.84	7.61	22,615
Mit.	18.5	7.48	72.2	0.18	0.24	19.1	19.3	0.23	4.85	5.07	230	21,495	21,724	24.0	0.84	7.60	22,582
% Reduced	7%	< 0.5%	< 0.5%	< 0.5%	< 0.5%	< 0.5%	< 0.5%	< 0.5%	< 0.5%	< 0.5%	—	< 0.5%	< 0.5%	< 0.5%	< 0.5%	< 0.5%	< 0.5%

2.5. Operations Emissions by Sector, Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Sector	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	31.8	27.8	327	0.99	0.45	106	107	0.42	26.9	27.3	—	101,893	101,893	3.25	4.17	57.0	103,275
Area	83.0	1.49	162	0.01	0.07	—	0.07	0.05	—	0.05	—	432	432	0.02	< 0.005	—	434
Energy	0.58	9.86	4.19	0.06	0.80	—	0.80	0.80	—	0.80	—	31,763	31,763	2.30	0.17	—	31,871
Water	—	—	—	—	—	—	—	—	—	—	228	1,546	1,774	23.4	0.57	—	2,528
Waste	—	—	—	—	—	—	—	—	—	—	1,161	0.00	1,161	116	0.00	—	4,061
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	21.4	21.4
Total	115	39.2	493	1.06	1.31	106	107	1.27	26.9	28.2	1,388	135,635	137,023	145	4.91	78.3	142,190
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	30.6	29.9	271	0.93	0.45	106	107	0.42	26.9	27.3	—	95,414	95,414	3.35	4.30	1.48	96,781
Area	69.0	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Energy	0.58	9.86	4.19	0.06	0.80	—	0.80	0.80	—	0.80	—	31,763	31,763	2.30	0.17	—	31,871
Water	—	—	—	—	—	—	—	—	—	—	228	1,546	1,774	23.4	0.57	—	2,528
Waste	—	—	—	—	—	—	—	—	—	—	1,161	0.00	1,161	116	0.00	—	4,061
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	21.4	21.4
Total	100	39.7	275	0.99	1.24	106	107	1.22	26.9	28.1	1,388	128,723	130,112	145	5.03	22.8	135,262
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	30.3	30.2	281	0.94	0.45	105	105	0.42	26.6	27.0	—	96,416	96,416	3.35	4.33	24.6	97,815
Area	78.6	1.02	111	< 0.005	0.05	—	0.05	0.04	—	0.04	—	296	296	0.01	< 0.005	—	297
Energy	0.58	9.86	4.19	0.06	0.80	—	0.80	0.80	—	0.80	—	31,763	31,763	2.30	0.17	—	31,871
Water	—	—	—	—	—	—	—	—	—	—	228	1,546	1,774	23.4	0.57	—	2,528
Waste	—	—	—	—	—	—	—	—	—	—	1,161	0.00	1,161	116	0.00	—	4,061
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	21.4	21.4
Total	109	41.1	396	1.01	1.29	105	106	1.25	26.6	27.9	1,388	130,022	131,410	145	5.07	46.0	136,593

Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	5.52	5.51	51.3	0.17	0.08	19.1	19.2	0.08	4.86	4.93	—	15,963	15,963	0.55	0.72	4.07	16,194
Area	14.3	0.19	20.3	< 0.005	0.01	—	0.01	0.01	—	0.01	—	49.0	49.0	< 0.005	< 0.005	—	49.2
Energy	0.11	1.80	0.77	0.01	0.15	—	0.15	0.15	—	0.15	—	5,259	5,259	0.38	0.03	—	5,277
Water	—	—	—	—	—	—	—	—	—	—	37.7	256	294	3.88	0.09	—	419
Waste	—	—	—	—	—	—	—	—	—	—	192	0.00	192	19.2	0.00	—	672
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	3.54	3.54
Total	20.0	7.50	72.3	0.18	0.24	19.1	19.4	0.23	4.86	5.08	230	21,527	21,756	24.0	0.84	7.61	22,615

2.6. Operations Emissions by Sector, Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Sector	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	31.8	27.8	326	0.99	0.45	106	106	0.42	26.9	27.3	—	101,690	101,690	3.25	4.17	56.9	103,069
Area	75.1	1.49	162	0.01	0.07	—	0.07	0.05	—	0.05	—	432	432	0.02	< 0.005	—	434
Energy	0.58	9.86	4.19	0.06	0.80	—	0.80	0.80	—	0.80	—	31,763	31,763	2.30	0.17	—	31,871
Water	—	—	—	—	—	—	—	—	—	—	228	1,546	1,774	23.4	0.57	—	2,528
Waste	—	—	—	—	—	—	—	—	—	—	1,161	0.00	1,161	116	0.00	—	4,061
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	21.4	21.4
Total	107	39.1	493	1.06	1.31	106	107	1.27	26.9	28.1	1,388	135,431	136,819	145	4.90	78.2	141,984
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	30.6	29.8	271	0.93	0.45	106	106	0.42	26.9	27.3	—	95,224	95,224	3.35	4.29	1.47	96,587
Area	61.1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Energy	0.58	9.86	4.19	0.06	0.80	—	0.80	0.80	—	0.80	—	31,763	31,763	2.30	0.17	—	31,871
Water	—	—	—	—	—	—	—	—	—	—	228	1,546	1,774	23.4	0.57	—	2,528

Waste	—	—	—	—	—	—	—	—	—	—	1,161	0.00	1,161	116	0.00	—	4,061
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	21.4	21.4
Total	92.3	39.7	275	0.99	1.24	106	107	1.22	26.9	28.1	1,388	128,533	129,921	145	5.03	22.8	135,068
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	30.2	30.1	280	0.94	0.45	105	105	0.42	26.5	27.0	—	96,224	96,224	3.34	4.32	24.6	97,619
Area	70.7	1.02	111	< 0.005	0.05	—	0.05	0.04	—	0.04	—	296	296	0.01	< 0.005	—	297
Energy	0.58	9.86	4.19	0.06	0.80	—	0.80	0.80	—	0.80	—	31,763	31,763	2.30	0.17	—	31,871
Water	—	—	—	—	—	—	—	—	—	—	228	1,546	1,774	23.4	0.57	—	2,528
Waste	—	—	—	—	—	—	—	—	—	—	1,161	0.00	1,161	116	0.00	—	4,061
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	21.4	21.4
Total	102	41.0	396	1.01	1.29	105	106	1.25	26.5	27.8	1,388	129,829	131,217	145	5.06	45.9	136,397
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	5.51	5.50	51.2	0.17	0.08	19.1	19.2	0.08	4.85	4.92	—	15,931	15,931	0.55	0.72	4.07	16,162
Area	12.9	0.19	20.3	< 0.005	0.01	—	0.01	0.01	—	0.01	—	49.0	49.0	< 0.005	< 0.005	—	49.2
Energy	0.11	1.80	0.77	0.01	0.15	—	0.15	0.15	—	0.15	—	5,259	5,259	0.38	0.03	—	5,277
Water	—	—	—	—	—	—	—	—	—	—	37.7	256	294	3.88	0.09	—	419
Waste	—	—	—	—	—	—	—	—	—	—	192	0.00	192	19.2	0.00	—	672
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	3.54	3.54
Total	18.5	7.48	72.2	0.18	0.24	19.1	19.3	0.23	4.85	5.07	230	21,495	21,724	24.0	0.84	7.60	22,582

3. Construction Emissions Details

3.1. Demolition (2023) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	2.84	27.3	23.5	0.03	1.20	—	1.20	1.10	—	1.10	—	3,425	3,425	0.14	0.03	—	3,437
Demolition	—	—	—	—	—	0.00	0.00	—	0.00	0.00	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	2.84	27.3	23.5	0.03	1.20	—	1.20	1.10	—	1.10	—	3,425	3,425	0.14	0.03	—	3,437
Demolition	—	—	—	—	—	0.00	0.00	—	0.00	0.00	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.78	7.49	6.44	0.01	0.33	—	0.33	0.30	—	0.30	—	938	938	0.04	0.01	—	942
Demolition	—	—	—	—	—	0.00	0.00	—	0.00	0.00	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.14	1.37	1.17	< 0.005	0.06	—	0.06	0.06	—	0.06	—	155	155	0.01	< 0.005	—	156
Demolition	—	—	—	—	—	0.00	0.00	—	0.00	0.00	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.08	0.08	1.39	0.00	0.00	0.20	0.20	0.00	0.05	0.05	—	220	220	0.01	0.01	0.94	224
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.08	0.09	1.04	0.00	0.00	0.20	0.20	0.00	0.05	0.05	—	202	202	0.01	0.01	0.02	204
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.02	0.03	0.30	0.00	0.00	0.05	0.05	0.00	0.01	0.01	—	56.1	56.1	< 0.005	< 0.005	0.11	56.9
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.06	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	9.29	9.29	< 0.005	< 0.005	0.02	9.42
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.2. Demolition (2023) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	2.84	27.3	23.5	0.03	1.20	—	1.20	1.10	—	1.10	—	3,425	3,425	0.14	0.03	—	3,437

Demoliti	—	—	—	—	—	0.00	0.00	—	0.00	0.00	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	2.84	27.3	23.5	0.03	1.20	—	1.20	1.10	—	1.10	—	3,425	3,425	0.14	0.03	—	3,437
Demolition	—	—	—	—	—	0.00	0.00	—	0.00	0.00	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.78	7.49	6.44	0.01	0.33	—	0.33	0.30	—	0.30	—	938	938	0.04	0.01	—	942
Demolition	—	—	—	—	—	0.00	0.00	—	0.00	0.00	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.14	1.37	1.17	< 0.005	0.06	—	0.06	0.06	—	0.06	—	155	155	0.01	< 0.005	—	156
Demolition	—	—	—	—	—	0.00	0.00	—	0.00	0.00	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.07	0.05	0.82	0.00	0.00	0.11	0.11	0.00	0.02	0.02	—	120	120	0.01	< 0.005	0.51	122
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.07	0.06	0.64	0.00	0.00	0.11	0.11	0.00	0.02	0.02	—	110	110	0.01	< 0.005	0.01	112
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.02	0.02	0.18	0.00	0.00	0.03	0.03	0.00	0.01	0.01	—	30.7	30.7	< 0.005	< 0.005	0.06	31.2
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.03	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	5.08	5.08	< 0.005	< 0.005	0.01	5.16
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.3. Site Preparation (2023) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	3.95	39.7	35.5	0.05	1.81	—	1.81	1.66	—	1.66	—	5,295	5,295	0.21	0.04	—	5,314
Dust From Material Movement	—	—	—	—	—	7.67	7.67	—	3.94	3.94	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.65	6.53	5.83	0.01	0.30	—	0.30	0.27	—	0.27	—	870	870	0.04	0.01	—	873
Dust From Material Movement	—	—	—	—	—	1.26	1.26	—	0.65	0.65	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.12	1.19	1.06	< 0.005	0.05	—	0.05	0.05	—	0.05	—	144	144	0.01	< 0.005	—	145
Dust From Material Movement	—	—	—	—	—	0.23	0.23	—	0.12	0.12	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.10	0.09	1.62	0.00	0.00	0.23	0.23	0.00	0.05	0.05	—	257	257	0.01	0.01	1.10	261
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.02	0.21	0.00	0.00	0.04	0.04	0.00	0.01	0.01	—	39.3	39.3	< 0.005	< 0.005	0.08	39.8

Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.04	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	6.50	6.50	< 0.005	< 0.005	0.01	6.59
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.4. Site Preparation (2023) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	3.95	39.7	35.5	0.05	1.81	—	1.81	1.66	—	1.66	—	5,295	5,295	0.21	0.04	—	5,314
Dust From Material Movement	—	—	—	—	—	7.67	7.67	—	3.94	3.94	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.65	6.53	5.83	0.01	0.30	—	0.30	0.27	—	0.27	—	870	870	0.04	0.01	—	873
Dust From Material Movement	—	—	—	—	—	1.26	1.26	—	0.65	0.65	—	—	—	—	—	—	—

Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.12	1.19	1.06	< 0.005	0.05	—	0.05	0.05	—	0.05	—	144	144	0.01	< 0.005	—	145
Dust From Material Movement	—	—	—	—	—	0.23	0.23	—	0.12	0.12	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.09	0.06	0.95	0.00	0.00	0.12	0.12	0.00	0.03	0.03	—	140	140	0.01	0.01	0.60	143
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.13	0.00	0.00	0.02	0.02	0.00	< 0.005	< 0.005	—	21.5	21.5	< 0.005	< 0.005	0.04	21.8
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.02	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	3.56	3.56	< 0.005	< 0.005	0.01	3.61
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.5. Grading (2023) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	3.72	37.3	31.4	0.06	1.59	—	1.59	1.47	—	1.47	—	6,598	6,598	0.27	0.05	—	6,621
Dust From Material Movement	—	—	—	—	—	3.59	3.59	—	1.42	1.42	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	3.72	37.3	31.4	0.06	1.59	—	1.59	1.47	—	1.47	—	6,598	6,598	0.27	0.05	—	6,621
Dust From Material Movement	—	—	—	—	—	3.59	3.59	—	1.42	1.42	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.80	8.03	6.76	0.01	0.34	—	0.34	0.32	—	0.32	—	1,420	1,420	0.06	0.01	—	1,425
Dust From Material Movement	—	—	—	—	—	0.77	0.77	—	0.31	0.31	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Off-Road Equipment	0.15	1.47	1.23	< 0.005	0.06	—	0.06	0.06	—	0.06	—	235	235	0.01	< 0.005	—	236
Dust From Material Movement	—	—	—	—	—	0.14	0.14	—	0.06	0.06	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.11	0.11	1.85	0.00	0.00	0.26	0.26	0.00	0.06	0.06	—	294	294	0.01	0.01	1.26	298
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.10	0.12	1.39	0.00	0.00	0.26	0.26	0.00	0.06	0.06	—	269	269	0.01	0.01	0.03	273
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.02	0.03	0.32	0.00	0.00	0.06	0.06	0.00	0.01	0.01	—	58.8	58.8	< 0.005	< 0.005	0.12	59.6
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.06	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	9.73	9.73	< 0.005	< 0.005	0.02	9.87
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.6. Grading (2023) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	3.72	37.3	31.4	0.06	1.59	—	1.59	1.47	—	1.47	—	6,598	6,598	0.27	0.05	—	6,621
Dust From Material Movement	—	—	—	—	—	3.59	3.59	—	1.42	1.42	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	3.72	37.3	31.4	0.06	1.59	—	1.59	1.47	—	1.47	—	6,598	6,598	0.27	0.05	—	6,621
Dust From Material Movement	—	—	—	—	—	3.59	3.59	—	1.42	1.42	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.80	8.03	6.76	0.01	0.34	—	0.34	0.32	—	0.32	—	1,420	1,420	0.06	0.01	—	1,425
Dust From Material Movement	—	—	—	—	—	0.77	0.77	—	0.31	0.31	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Off-Road Equipment	0.15	1.47	1.23	< 0.005	0.06	—	0.06	0.06	—	0.06	—	235	235	0.01	< 0.005	—	236
Dust From Material Movement	—	—	—	—	—	0.14	0.14	—	0.06	0.06	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.10	0.06	1.09	0.00	0.00	0.14	0.14	0.00	0.03	0.03	—	161	161	0.01	0.01	0.68	163
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.09	0.07	0.86	0.00	0.00	0.14	0.14	0.00	0.03	0.03	—	147	147	0.01	0.01	0.02	149
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.02	0.02	0.19	0.00	0.00	0.03	0.03	0.00	0.01	0.01	—	32.1	32.1	< 0.005	< 0.005	0.06	32.7
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.04	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	5.32	5.32	< 0.005	< 0.005	0.01	5.41
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.7. Grading (2024) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	3.52	34.3	30.2	0.06	1.45	—	1.45	1.33	—	1.33	—	6,598	6,598	0.27	0.05	—	6,621
Dust From Material Movement	—	—	—	—	—	3.59	3.59	—	1.42	1.42	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	3.52	34.3	30.2	0.06	1.45	—	1.45	1.33	—	1.33	—	6,598	6,598	0.27	0.05	—	6,621
Dust From Material Movement	—	—	—	—	—	3.59	3.59	—	1.42	1.42	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.74	7.18	6.32	0.01	0.30	—	0.30	0.28	—	0.28	—	1,382	1,382	0.06	0.01	—	1,386
Dust From Material Movement	—	—	—	—	—	0.75	0.75	—	0.30	0.30	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Off-Road Equipment	0.13	1.31	1.15	< 0.005	0.06	—	0.06	0.05	—	0.05	—	229	229	0.01	< 0.005	—	230
Dust From Material Movement	—	—	—	—	—	0.14	0.14	—	0.05	0.05	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.10	0.10	1.69	0.00	0.00	0.26	0.26	0.00	0.06	0.06	—	288	288	0.01	0.01	1.15	292
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.10	0.11	1.28	0.00	0.00	0.26	0.26	0.00	0.06	0.06	—	264	264	0.01	0.01	0.03	267
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.02	0.02	0.28	0.00	0.00	0.05	0.05	0.00	0.01	0.01	—	56.0	56.0	< 0.005	< 0.005	0.10	56.8
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.05	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	9.28	9.28	< 0.005	< 0.005	0.02	9.41
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.8. Grading (2024) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	3.52	34.3	30.2	0.06	1.45	—	1.45	1.33	—	1.33	—	6,598	6,598	0.27	0.05	—	6,621
Dust From Material Movement	—	—	—	—	—	3.59	3.59	—	1.42	1.42	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	3.52	34.3	30.2	0.06	1.45	—	1.45	1.33	—	1.33	—	6,598	6,598	0.27	0.05	—	6,621
Dust From Material Movement	—	—	—	—	—	3.59	3.59	—	1.42	1.42	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.74	7.18	6.32	0.01	0.30	—	0.30	0.28	—	0.28	—	1,382	1,382	0.06	0.01	—	1,386
Dust From Material Movement	—	—	—	—	—	0.75	0.75	—	0.30	0.30	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Off-Road Equipment	0.13	1.31	1.15	< 0.005	0.06	—	0.06	0.05	—	0.05	—	229	229	0.01	< 0.005	—	230
Dust From Material Movement	—	—	—	—	—	0.14	0.14	—	0.05	0.05	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.09	0.06	0.99	0.00	0.00	0.14	0.14	0.00	0.03	0.03	—	157	157	0.01	0.01	0.62	160
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.09	0.07	0.79	0.00	0.00	0.14	0.14	0.00	0.03	0.03	—	144	144	0.01	0.01	0.02	146
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.02	0.01	0.17	0.00	0.00	0.03	0.03	0.00	0.01	0.01	—	30.6	30.6	< 0.005	< 0.005	0.06	31.1
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.03	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	5.07	5.07	< 0.005	< 0.005	0.01	5.15
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.9. Building Construction (2024) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.20	11.2	13.1	0.02	0.50	—	0.50	0.46	—	0.46	—	2,398	2,398	0.10	0.02	—	2,406
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.20	11.2	13.1	0.02	0.50	—	0.50	0.46	—	0.46	—	2,398	2,398	0.10	0.02	—	2,406
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.61	5.69	6.65	0.01	0.25	—	0.25	0.23	—	0.23	—	1,215	1,215	0.05	0.01	—	1,219
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.11	1.04	1.21	< 0.005	0.05	—	0.05	0.04	—	0.04	—	201	201	0.01	< 0.005	—	202
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	10.4	9.59	167	0.00	0.00	25.8	25.8	0.00	6.06	6.06	—	28,459	28,459	1.20	0.98	114	28,895
Vendor	0.27	11.0	5.87	0.07	0.14	2.61	2.74	0.14	0.72	0.86	—	9,549	9,549	0.74	1.42	26.6	10,018

Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	9.74	11.3	126	0.00	0.00	25.8	25.8	0.00	6.06	6.06	—	26,084	26,084	1.24	0.98	2.95	26,411
Vendor	0.25	11.4	5.96	0.07	0.14	2.61	2.74	0.14	0.72	0.86	—	9,553	9,553	0.74	1.42	0.69	9,996
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	4.89	5.72	67.3	0.00	0.00	12.9	12.9	0.00	3.03	3.03	—	13,408	13,408	0.63	0.50	24.9	13,597
Vendor	0.13	5.82	3.00	0.03	0.07	1.31	1.38	0.07	0.36	0.43	—	4,841	4,841	0.37	0.72	5.81	5,071
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.89	1.04	12.3	0.00	0.00	2.36	2.36	0.00	0.55	0.55	—	2,220	2,220	0.10	0.08	4.12	2,251
Vendor	0.02	1.06	0.55	0.01	0.01	0.24	0.25	0.01	0.07	0.08	—	801	801	0.06	0.12	0.96	840
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.10. Building Construction (2024) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.20	11.2	13.1	0.02	0.50	—	0.50	0.46	—	0.46	—	2,398	2,398	0.10	0.02	—	2,406
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Off-Road Equipment	1.20	11.2	13.1	0.02	0.50	—	0.50	0.46	—	0.46	—	2,398	2,398	0.10	0.02	—	2,406
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.61	5.69	6.65	0.01	0.25	—	0.25	0.23	—	0.23	—	1,215	1,215	0.05	0.01	—	1,219
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.11	1.04	1.21	< 0.005	0.05	—	0.05	0.04	—	0.04	—	201	201	0.01	< 0.005	—	202
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	9.24	5.88	98.3	0.00	0.00	14.0	14.0	0.00	3.27	3.27	—	15,547	15,547	0.83	0.61	61.5	15,811
Vendor	0.27	11.0	5.87	0.07	0.14	2.61	2.74	0.14	0.72	0.86	—	9,549	9,549	0.74	1.42	26.6	10,018
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	8.63	6.84	77.8	0.00	0.00	14.0	14.0	0.00	3.27	3.27	—	14,267	14,267	0.87	0.61	1.60	14,472
Vendor	0.25	11.4	5.96	0.07	0.14	2.61	2.74	0.14	0.72	0.86	—	9,553	9,553	0.74	1.42	0.69	9,996
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	4.33	3.47	41.2	0.00	0.00	6.99	6.99	0.00	1.64	1.64	—	7,332	7,332	0.44	0.31	13.5	7,449
Vendor	0.13	5.82	3.00	0.03	0.07	1.31	1.38	0.07	0.36	0.43	—	4,841	4,841	0.37	0.72	5.81	5,071
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.79	0.63	7.52	0.00	0.00	1.28	1.28	0.00	0.30	0.30	—	1,214	1,214	0.07	0.05	2.23	1,233
Vendor	0.02	1.06	0.55	0.01	0.01	0.24	0.25	0.01	0.07	0.08	—	801	801	0.06	0.12	0.96	840
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.11. Building Construction (2025) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.13	10.4	13.0	0.02	0.43	—	0.43	0.40	—	0.40	—	2,398	2,398	0.10	0.02	—	2,406
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.13	10.4	13.0	0.02	0.43	—	0.43	0.40	—	0.40	—	2,398	2,398	0.10	0.02	—	2,406
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.80	7.46	9.31	0.02	0.31	—	0.31	0.28	—	0.28	—	1,713	1,713	0.07	0.01	—	1,719
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.15	1.36	1.70	< 0.005	0.06	—	0.06	0.05	—	0.05	—	284	284	0.01	< 0.005	—	285

Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	9.06	8.69	154	0.00	0.00	25.8	25.8	0.00	6.06	6.06	—	27,854	27,854	1.15	0.98	103	28,278
Vendor	0.26	10.4	5.65	0.07	0.14	2.61	2.74	0.14	0.72	0.86	—	9,396	9,396	0.73	1.42	26.4	9,864
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	8.50	9.59	116	0.00	0.00	25.8	25.8	0.00	6.06	6.06	—	25,537	25,537	1.20	0.98	2.67	25,862
Vendor	0.25	10.9	5.66	0.07	0.14	2.61	2.74	0.14	0.72	0.86	—	9,401	9,401	0.73	1.42	0.69	9,844
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	5.98	7.42	87.5	0.00	0.00	18.2	18.2	0.00	4.27	4.27	—	18,499	18,499	0.86	0.70	31.9	18,761
Vendor	0.18	7.83	4.01	0.05	0.10	1.84	1.94	0.10	0.51	0.61	—	6,713	6,713	0.52	1.02	8.18	7,037
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	1.09	1.35	16.0	0.00	0.00	3.33	3.33	0.00	0.78	0.78	—	3,063	3,063	0.14	0.12	5.28	3,106
Vendor	0.03	1.43	0.73	0.01	0.02	0.34	0.35	0.02	0.09	0.11	—	1,111	1,111	0.09	0.17	1.36	1,165
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.12. Building Construction (2025) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.13	10.4	13.0	0.02	0.43	—	0.43	0.40	—	0.40	—	2,398	2,398	0.10	0.02	—	2,406
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.13	10.4	13.0	0.02	0.43	—	0.43	0.40	—	0.40	—	2,398	2,398	0.10	0.02	—	2,406
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.80	7.46	9.31	0.02	0.31	—	0.31	0.28	—	0.28	—	1,713	1,713	0.07	0.01	—	1,719
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.15	1.36	1.70	< 0.005	0.06	—	0.06	0.05	—	0.05	—	284	284	0.01	< 0.005	—	285
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	8.32	5.36	90.6	0.00	0.00	14.0	14.0	0.00	3.27	3.27	—	15,216	15,216	0.78	0.61	55.8	15,474
Vendor	0.26	10.4	5.65	0.07	0.14	2.61	2.74	0.14	0.72	0.86	—	9,396	9,396	0.73	1.42	26.4	9,864
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Worker	7.76	5.88	71.6	0.00	0.00	14.0	14.0	0.00	3.27	3.27	—	13,967	13,967	0.83	0.61	1.45	14,171
Vendor	0.25	10.9	5.66	0.07	0.14	2.61	2.74	0.14	0.72	0.86	—	9,401	9,401	0.73	1.42	0.69	9,844
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	5.45	4.51	53.6	0.00	0.00	9.86	9.86	0.00	2.31	2.31	—	10,116	10,116	0.59	0.44	17.2	10,278
Vendor	0.18	7.83	4.01	0.05	0.10	1.84	1.94	0.10	0.51	0.61	—	6,713	6,713	0.52	1.02	8.18	7,037
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.99	0.82	9.78	0.00	0.00	1.80	1.80	0.00	0.42	0.42	—	1,675	1,675	0.10	0.07	2.85	1,702
Vendor	0.03	1.43	0.73	0.01	0.02	0.34	0.35	0.02	0.09	0.11	—	1,111	1,111	0.09	0.17	1.36	1,165
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.13. Building Construction (2026) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.07	9.85	13.0	0.02	0.38	—	0.38	0.35	—	0.35	—	2,397	2,397	0.10	0.02	—	2,405
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.07	9.85	13.0	0.02	0.38	—	0.38	0.35	—	0.35	—	2,397	2,397	0.10	0.02	—	2,405
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.77	7.04	9.26	0.02	0.27	—	0.27	0.25	—	0.25	—	1,712	1,712	0.07	0.01	—	1,718
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.14	1.28	1.69	< 0.005	0.05	—	0.05	0.05	—	0.05	—	283	283	0.01	< 0.005	—	284
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	8.54	7.80	142	0.00	0.00	25.8	25.8	0.00	6.06	6.06	—	27,284	27,284	1.15	0.94	93.4	27,686
Vendor	0.19	9.99	5.41	0.07	0.14	2.61	2.74	0.14	0.72	0.86	—	9,238	9,238	0.65	1.42	24.4	9,703
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	7.98	8.69	107	0.00	0.00	25.8	25.8	0.00	6.06	6.06	—	25,022	25,022	0.39	0.98	2.42	25,327
Vendor	0.18	10.4	5.49	0.07	0.14	2.61	2.74	0.14	0.72	0.86	—	9,243	9,243	0.65	1.42	0.63	9,685
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	5.70	6.79	80.8	0.00	0.00	18.2	18.2	0.00	4.27	4.27	—	18,124	18,124	0.28	0.70	28.8	18,369
Vendor	0.13	7.47	3.90	0.05	0.10	1.84	1.94	0.10	0.51	0.61	—	6,600	6,600	0.47	1.02	7.49	6,922
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	1.04	1.24	14.7	0.00	0.00	3.33	3.33	0.00	0.78	0.78	—	3,001	3,001	0.05	0.12	4.77	3,041
Vendor	0.02	1.36	0.71	0.01	0.02	0.34	0.35	0.02	0.09	0.11	—	1,093	1,093	0.08	0.17	1.24	1,146

Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.14. Building Construction (2026) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.07	9.85	13.0	0.02	0.38	—	0.38	0.35	—	0.35	—	2,397	2,397	0.10	0.02	—	2,405
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.07	9.85	13.0	0.02	0.38	—	0.38	0.35	—	0.35	—	2,397	2,397	0.10	0.02	—	2,405
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.77	7.04	9.26	0.02	0.27	—	0.27	0.25	—	0.25	—	1,712	1,712	0.07	0.01	—	1,718
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.14	1.28	1.69	< 0.005	0.05	—	0.05	0.05	—	0.05	—	283	283	0.01	< 0.005	—	284
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	7.80	4.84	83.8	0.00	0.00	14.0	14.0	0.00	3.27	3.27	—	14,905	14,905	0.78	0.57	50.5	15,144
Vendor	0.19	9.99	5.41	0.07	0.14	2.61	2.74	0.14	0.72	0.86	—	9,238	9,238	0.65	1.42	24.4	9,703
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	7.23	5.36	66.4	0.00	0.00	14.0	14.0	0.00	3.27	3.27	—	13,685	13,685	0.39	0.61	1.31	13,878
Vendor	0.18	10.4	5.49	0.07	0.14	2.61	2.74	0.14	0.72	0.86	—	9,243	9,243	0.65	1.42	0.63	9,685
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	5.17	4.14	49.6	0.00	0.00	9.86	9.86	0.00	2.31	2.31	—	9,910	9,910	0.28	0.44	15.6	10,063
Vendor	0.13	7.47	3.90	0.05	0.10	1.84	1.94	0.10	0.51	0.61	—	6,600	6,600	0.47	1.02	7.49	6,922
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.94	0.76	9.04	0.00	0.00	1.80	1.80	0.00	0.42	0.42	—	1,641	1,641	0.05	0.07	2.58	1,666
Vendor	0.02	1.36	0.71	0.01	0.02	0.34	0.35	0.02	0.09	0.11	—	1,093	1,093	0.08	0.17	1.24	1,146
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.15. Building Construction (2027) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.03	9.39	12.9	0.02	0.34	—	0.34	0.31	—	0.31	—	2,397	2,397	0.10	0.02	—	2,405

Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.03	9.39	12.9	0.02	0.34	—	0.34	0.31	—	0.31	—	2,397	2,397	0.10	0.02	—	2,405
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.74	6.71	9.24	0.02	0.24	—	0.24	0.22	—	0.22	—	1,712	1,712	0.07	0.01	—	1,718
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.13	1.22	1.69	< 0.005	0.04	—	0.04	0.04	—	0.04	—	283	283	0.01	< 0.005	—	284
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	8.15	6.91	133	0.00	0.00	25.8	25.8	0.00	6.06	6.06	—	26,737	26,737	0.31	0.94	84.0	27,107
Vendor	0.19	9.54	5.19	0.07	0.14	2.61	2.74	0.14	0.72	0.86	—	9,065	9,065	0.65	1.35	21.7	9,507
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	7.63	7.80	99.8	0.00	0.00	25.8	25.8	0.00	6.06	6.06	—	24,525	24,525	0.35	0.94	2.18	24,815
Vendor	0.18	10.0	5.26	0.07	0.14	2.61	2.74	0.14	0.72	0.86	—	9,071	9,071	0.65	1.35	0.56	9,491
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	5.48	6.15	74.7	0.00	0.00	18.2	18.2	0.00	4.27	4.27	—	17,763	17,763	0.25	0.67	25.9	17,995
Vendor	0.13	7.15	3.73	0.05	0.10	1.84	1.94	0.10	0.51	0.61	—	6,477	6,477	0.46	0.97	6.69	6,784
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	1.00	1.12	13.6	0.00	0.00	3.33	3.33	0.00	0.78	0.78	—	2,941	2,941	0.04	0.11	4.29	2,979
Vendor	0.02	1.30	0.68	0.01	0.02	0.34	0.35	0.02	0.09	0.11	—	1,072	1,072	0.08	0.16	1.11	1,123
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.16. Building Construction (2027) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.03	9.39	12.9	0.02	0.34	—	0.34	0.31	—	0.31	—	2,397	2,397	0.10	0.02	—	2,405
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.03	9.39	12.9	0.02	0.34	—	0.34	0.31	—	0.31	—	2,397	2,397	0.10	0.02	—	2,405
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.74	6.71	9.24	0.02	0.24	—	0.24	0.22	—	0.22	—	1,712	1,712	0.07	0.01	—	1,718

Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.13	1.22	1.69	< 0.005	0.04	—	0.04	0.04	—	0.04	—	283	283	0.01	< 0.005	—	284
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	7.41	4.31	78.1	0.00	0.00	14.0	14.0	0.00	3.27	3.27	—	14,605	14,605	0.31	0.57	45.4	14,827
Vendor	0.19	9.54	5.19	0.07	0.14	2.61	2.74	0.14	0.72	0.86	—	9,065	9,065	0.65	1.35	21.7	9,507
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	6.89	4.84	61.7	0.00	0.00	14.0	14.0	0.00	3.27	3.27	—	13,412	13,412	0.35	0.57	1.18	13,591
Vendor	0.18	10.0	5.26	0.07	0.14	2.61	2.74	0.14	0.72	0.86	—	9,071	9,071	0.65	1.35	0.56	9,491
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	4.95	3.77	45.9	0.00	0.00	9.86	9.86	0.00	2.31	2.31	—	9,713	9,713	0.25	0.40	14.0	9,854
Vendor	0.13	7.15	3.73	0.05	0.10	1.84	1.94	0.10	0.51	0.61	—	6,477	6,477	0.46	0.97	6.69	6,784
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.90	0.69	8.37	0.00	0.00	1.80	1.80	0.00	0.42	0.42	—	1,608	1,608	0.04	0.07	2.32	1,631
Vendor	0.02	1.30	0.68	0.01	0.02	0.34	0.35	0.02	0.09	0.11	—	1,072	1,072	0.08	0.16	1.11	1,123
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.17. Building Construction (2028) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.99	8.92	12.9	0.02	0.30	—	0.30	0.28	—	0.28	—	2,397	2,397	0.10	0.02	—	2,406
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.99	8.92	12.9	0.02	0.30	—	0.30	0.28	—	0.28	—	2,397	2,397	0.10	0.02	—	2,406
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.71	6.39	9.26	0.02	0.22	—	0.22	0.20	—	0.20	—	1,717	1,717	0.07	0.01	—	1,723
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.13	1.17	1.69	< 0.005	0.04	—	0.04	0.04	—	0.04	—	284	284	0.01	< 0.005	—	285
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	7.80	6.82	123	0.00	0.00	25.8	25.8	0.00	6.06	6.06	—	26,227	26,227	0.31	0.94	75.4	26,589
Vendor	0.19	9.15	5.03	0.07	0.14	2.61	2.74	0.07	0.72	0.79	—	8,857	8,857	0.57	1.35	19.3	9,294

Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	7.37	6.91	92.3	0.00	0.00	25.8	25.8	0.00	6.06	6.06	—	24,062	24,062	0.35	0.94	1.96	24,352
Vendor	0.18	9.55	5.11	0.07	0.14	2.61	2.74	0.07	0.72	0.79	—	8,863	8,863	0.57	1.35	0.50	9,281
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	5.24	5.52	70.1	0.00	0.00	18.3	18.3	0.00	4.28	4.28	—	17,476	17,476	0.25	0.67	23.4	17,705
Vendor	0.13	6.84	3.63	0.05	0.10	1.85	1.95	0.05	0.51	0.56	—	6,345	6,345	0.41	0.97	5.96	6,651
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.96	1.01	12.8	0.00	0.00	3.34	3.34	0.00	0.78	0.78	—	2,893	2,893	0.04	0.11	3.87	2,931
Vendor	0.02	1.25	0.66	0.01	0.02	0.34	0.36	0.01	0.09	0.10	—	1,051	1,051	0.07	0.16	0.99	1,101
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.18. Building Construction (2028) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.99	8.92	12.9	0.02	0.30	—	0.30	0.28	—	0.28	—	2,397	2,397	0.10	0.02	—	2,406
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Off-Road Equipment	0.99	8.92	12.9	0.02	0.30	—	0.30	0.28	—	0.28	—	2,397	2,397	0.10	0.02	—	2,406
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.71	6.39	9.26	0.02	0.22	—	0.22	0.20	—	0.20	—	1,717	1,717	0.07	0.01	—	1,723
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.13	1.17	1.69	< 0.005	0.04	—	0.04	0.04	—	0.04	—	284	284	0.01	< 0.005	—	285
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	7.06	4.23	72.3	0.00	0.00	14.0	14.0	0.00	3.27	3.27	—	14,327	14,327	0.31	0.57	40.8	14,544
Vendor	0.19	9.15	5.03	0.07	0.14	2.61	2.74	0.07	0.72	0.79	—	8,857	8,857	0.57	1.35	19.3	9,294
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	6.62	4.31	57.1	0.00	0.00	14.0	14.0	0.00	3.27	3.27	—	13,159	13,159	0.35	0.57	1.06	13,337
Vendor	0.18	9.55	5.11	0.07	0.14	2.61	2.74	0.07	0.72	0.79	—	8,863	8,863	0.57	1.35	0.50	9,281
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	4.71	3.40	43.0	0.00	0.00	9.88	9.88	0.00	2.31	2.31	—	9,555	9,555	0.25	0.41	12.6	9,695
Vendor	0.13	6.84	3.63	0.05	0.10	1.85	1.95	0.05	0.51	0.56	—	6,345	6,345	0.41	0.97	5.96	6,651
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.86	0.62	7.86	0.00	0.00	1.80	1.80	0.00	0.42	0.42	—	1,582	1,582	0.04	0.07	2.09	1,605
Vendor	0.02	1.25	0.66	0.01	0.02	0.34	0.36	0.01	0.09	0.10	—	1,051	1,051	0.07	0.16	0.99	1,101
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.19. Building Construction (2029) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.97	8.58	12.9	0.02	0.28	—	0.28	0.25	—	0.25	—	2,397	2,397	0.10	0.02	—	2,405
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.97	8.58	12.9	0.02	0.28	—	0.28	0.25	—	0.25	—	2,397	2,397	0.10	0.02	—	2,405
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.69	6.13	9.22	0.02	0.20	—	0.20	0.18	—	0.18	—	1,712	1,712	0.07	0.01	—	1,718
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.13	1.12	1.68	< 0.005	0.04	—	0.04	0.03	—	0.03	—	283	283	0.01	< 0.005	—	284

Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	7.41	5.97	115	0.00	0.00	25.8	25.8	0.00	6.06	6.06	—	25,752	25,752	0.26	0.94	67.3	26,105
Vendor	0.19	8.75	4.81	0.07	0.07	2.61	2.67	0.07	0.72	0.79	—	8,625	8,625	0.57	1.29	16.9	9,039
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	6.17	6.86	86.4	0.00	0.00	25.8	25.8	0.00	6.06	6.06	—	23,631	23,631	0.31	0.94	1.74	23,920
Vendor	0.18	9.09	4.87	0.07	0.07	2.61	2.67	0.07	0.72	0.79	—	8,631	8,631	0.57	1.29	0.44	9,029
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	4.40	4.90	65.1	0.00	0.00	18.2	18.2	0.00	4.27	4.27	—	17,116	17,116	0.22	0.67	20.8	17,341
Vendor	0.13	6.53	3.46	0.05	0.05	1.84	1.89	0.05	0.51	0.56	—	6,162	6,162	0.40	0.92	5.23	6,452
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.80	0.89	11.9	0.00	0.00	3.33	3.33	0.00	0.78	0.78	—	2,834	2,834	0.04	0.11	3.44	2,871
Vendor	0.02	1.19	0.63	0.01	0.01	0.34	0.35	0.01	0.09	0.10	—	1,020	1,020	0.07	0.15	0.87	1,068
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.20. Building Construction (2029) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.97	8.58	12.9	0.02	0.28	—	0.28	0.25	—	0.25	—	2,397	2,397	0.10	0.02	—	2,405
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.97	8.58	12.9	0.02	0.28	—	0.28	0.25	—	0.25	—	2,397	2,397	0.10	0.02	—	2,405
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.69	6.13	9.22	0.02	0.20	—	0.20	0.18	—	0.18	—	1,712	1,712	0.07	0.01	—	1,718
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.13	1.12	1.68	< 0.005	0.04	—	0.04	0.03	—	0.03	—	283	283	0.01	< 0.005	—	284
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	6.67	3.75	67.6	0.00	0.00	14.0	14.0	0.00	3.27	3.27	—	14,067	14,067	0.26	0.57	36.4	14,278
Vendor	0.19	8.75	4.81	0.07	0.07	2.61	2.67	0.07	0.72	0.79	—	8,625	8,625	0.57	1.29	16.9	9,039
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Worker	5.80	4.27	53.4	0.00	0.00	14.0	14.0	0.00	3.27	3.27	—	12,923	12,923	0.31	0.57	0.94	13,100
Vendor	0.18	9.09	4.87	0.07	0.07	2.61	2.67	0.07	0.72	0.79	—	8,631	8,631	0.57	1.29	0.44	9,029
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	4.14	3.05	40.0	0.00	0.00	9.86	9.86	0.00	2.31	2.31	—	9,358	9,358	0.22	0.40	11.2	9,495
Vendor	0.13	6.53	3.46	0.05	0.05	1.84	1.89	0.05	0.51	0.56	—	6,162	6,162	0.40	0.92	5.23	6,452
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.76	0.56	7.30	0.00	0.00	1.80	1.80	0.00	0.42	0.42	—	1,549	1,549	0.04	0.07	1.86	1,572
Vendor	0.02	1.19	0.63	0.01	0.01	0.34	0.35	0.01	0.09	0.10	—	1,020	1,020	0.07	0.15	0.87	1,068
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.21. Building Construction (2030) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.94	8.39	12.9	0.02	0.26	—	0.26	0.24	—	0.24	—	2,397	2,397	0.10	0.02	—	2,405
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.16	1.40	2.14	< 0.005	0.04	—	0.04	0.04	—	0.04	—	399	399	0.02	< 0.005	—	400

Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.03	0.25	0.39	< 0.005	0.01	—	0.01	0.01	—	0.01	—	66.0	66.0	< 0.005	< 0.005	—	66.2
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	5.91	5.97	80.6	0.00	0.00	25.8	25.8	0.00	6.06	6.06	—	23,230	23,230	0.31	0.94	1.56	23,519
Vendor	0.17	8.76	4.72	0.07	0.07	2.61	2.67	0.07	0.72	0.79	—	8,379	8,379	0.49	1.29	0.38	8,775
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.98	0.99	14.1	0.00	0.00	4.25	4.25	0.00	0.99	0.99	—	3,918	3,918	0.05	0.16	4.30	3,970
Vendor	0.03	1.46	0.78	0.01	0.01	0.43	0.44	0.01	0.12	0.13	—	1,393	1,393	0.08	0.21	1.06	1,460
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.18	0.18	2.57	0.00	0.00	0.77	0.77	0.00	0.18	0.18	—	649	649	0.01	0.03	0.71	657
Vendor	0.01	0.27	0.14	< 0.005	< 0.005	0.08	0.08	< 0.005	0.02	0.02	—	231	231	0.01	0.04	0.18	242
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.22. Building Construction (2030) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.94	8.39	12.9	0.02	0.26	—	0.26	0.24	—	0.24	—	2,397	2,397	0.10	0.02	—	2,405
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.16	1.40	2.14	< 0.005	0.04	—	0.04	0.04	—	0.04	—	399	399	0.02	< 0.005	—	400
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.03	0.25	0.39	< 0.005	0.01	—	0.01	0.01	—	0.01	—	66.0	66.0	< 0.005	< 0.005	—	66.2
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	5.53	3.75	49.9	0.00	0.00	14.0	14.0	0.00	3.27	3.27	—	12,703	12,703	0.31	0.57	0.84	12,880
Vendor	0.17	8.76	4.72	0.07	0.07	2.61	2.67	0.07	0.72	0.79	—	8,379	8,379	0.49	1.29	0.38	8,775
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.91	0.62	8.65	0.00	0.00	2.30	2.30	0.00	0.54	0.54	—	2,142	2,142	0.05	0.09	2.32	2,174

Vendor	0.03	1.46	0.78	0.01	0.01	0.43	0.44	0.01	0.12	0.13	—	1,393	1,393	0.08	0.21	1.06	1,460
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.17	0.11	1.58	0.00	0.00	0.42	0.42	0.00	0.10	0.10	—	355	355	0.01	0.02	0.38	360
Vendor	0.01	0.27	0.14	< 0.005	< 0.005	0.08	0.08	< 0.005	0.02	0.02	—	231	231	0.01	0.04	0.18	242
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.23. Paving (2030) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.64	6.28	9.90	0.01	0.22	—	0.22	0.20	—	0.20	—	1,511	1,511	0.06	0.01	—	1,516
Paving	0.00	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.64	6.28	9.90	0.01	0.22	—	0.22	0.20	—	0.20	—	1,511	1,511	0.06	0.01	—	1,516
Paving	0.00	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.19	1.89	2.98	< 0.005	0.07	—	0.07	0.06	—	0.06	—	455	455	0.02	< 0.005	—	457
Paving	0.00	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.04	0.35	0.54	< 0.005	0.01	—	0.01	0.01	—	0.01	—	75.4	75.4	< 0.005	< 0.005	—	75.6
Paving	0.00	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.05	0.04	0.81	0.00	0.00	0.20	0.20	0.00	0.05	0.05	—	192	192	< 0.005	0.01	0.45	195
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.04	0.05	0.61	0.00	0.00	0.20	0.20	0.00	0.05	0.05	—	176	176	< 0.005	0.01	0.01	178
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.19	0.00	0.00	0.06	0.06	0.00	0.01	0.01	—	53.9	53.9	< 0.005	< 0.005	0.06	54.6
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.04	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	8.92	8.92	< 0.005	< 0.005	0.01	9.04
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.24. Paving (2030) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.64	6.28	9.90	0.01	0.22	—	0.22	0.20	—	0.20	—	1,511	1,511	0.06	0.01	—	1,516
Paving	0.00	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.64	6.28	9.90	0.01	0.22	—	0.22	0.20	—	0.20	—	1,511	1,511	0.06	0.01	—	1,516
Paving	0.00	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.19	1.89	2.98	< 0.005	0.07	—	0.07	0.06	—	0.06	—	455	455	0.02	< 0.005	—	457
Paving	0.00	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.04	0.35	0.54	< 0.005	0.01	—	0.01	0.01	—	0.01	—	75.4	75.4	< 0.005	< 0.005	—	75.6
Paving	0.00	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.04	0.02	0.48	0.00	0.00	0.11	0.11	0.00	0.02	0.02	—	105	105	< 0.005	< 0.005	0.25	106
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.04	0.03	0.38	0.00	0.00	0.11	0.11	0.00	0.02	0.02	—	96.4	96.4	< 0.005	< 0.005	0.01	97.7
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.12	0.00	0.00	0.03	0.03	0.00	0.01	0.01	—	29.4	29.4	< 0.005	< 0.005	0.03	29.9
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.02	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	4.88	4.88	< 0.005	< 0.005	0.01	4.95
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.25. Architectural Coating (2030) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Off-Road Equipment	0.10	0.78	1.11	< 0.005	0.01	—	0.01	0.01	—	0.01	—	134	134	0.01	< 0.005	—	134
Architectural Coatings	170	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.10	0.78	1.11	< 0.005	0.01	—	0.01	0.01	—	0.01	—	134	134	0.01	< 0.005	—	134
Architectural Coatings	170	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.02	0.19	0.27	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	32.9	32.9	< 0.005	< 0.005	—	33.0
Architectural Coatings	41.9	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	0.04	0.05	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	5.45	5.45	< 0.005	< 0.005	—	5.47
Architectural Coatings	7.64	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	1.25	1.02	21.3	0.00	0.00	5.17	5.17	0.00	1.21	1.21	—	5,062	5,062	0.05	0.19	12.0	5,131
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	1.18	1.19	16.1	0.00	0.00	5.17	5.17	0.00	1.21	1.21	—	4,646	4,646	0.06	0.19	0.31	4,704
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.29	0.29	4.17	0.00	0.00	1.26	1.26	0.00	0.29	0.29	—	1,162	1,162	0.02	0.05	1.27	1,177
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.05	0.05	0.76	0.00	0.00	0.23	0.23	0.00	0.05	0.05	—	192	192	< 0.005	0.01	0.21	195
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.26. Architectural Coating (2030) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.10	0.78	1.11	< 0.005	0.01	—	0.01	0.01	—	0.01	—	134	134	0.01	< 0.005	—	134

Architect Coatings	170	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.10	0.78	1.11	< 0.005	0.01	—	0.01	0.01	—	0.01	—	134	134	0.01	< 0.005	—	134
Architectural Coatings	170	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.02	0.19	0.27	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	32.9	32.9	< 0.005	< 0.005	—	33.0
Architectural Coatings	41.9	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	0.04	0.05	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	5.45	5.45	< 0.005	< 0.005	—	5.47
Architectural Coatings	7.64	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Worker	1.18	0.65	12.6	0.00	0.00	2.79	2.79	0.00	0.65	0.65	—	2,765	2,765	0.05	0.11	6.48	2,806
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	1.11	0.75	9.97	0.00	0.00	2.79	2.79	0.00	0.65	0.65	—	2,541	2,541	0.06	0.11	0.17	2,576
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.27	0.18	2.56	0.00	0.00	0.68	0.68	0.00	0.16	0.16	—	635	635	0.02	0.03	0.69	644
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.05	0.03	0.47	0.00	0.00	0.12	0.12	0.00	0.03	0.03	—	105	105	< 0.005	< 0.005	0.11	107
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.27. Architectural Coating (2031) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.10	0.78	1.10	< 0.005	0.01	—	0.01	0.01	—	0.01	—	134	134	0.01	< 0.005	—	134

Architect Coatings	170	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01	0.04	0.06	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	7.32	7.32	< 0.005	< 0.005	—	7.34
Architectural Coatings	9.30	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	0.01	0.01	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	1.21	1.21	< 0.005	< 0.005	—	1.22
Architectural Coatings	1.70	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	1.10	1.02	15.0	0.00	0.00	5.17	5.17	0.00	1.21	1.21	—	4,572	4,572	0.05	0.19	0.27	4,630
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.06	0.06	0.86	0.00	0.00	0.28	0.28	0.00	0.07	0.07	—	254	254	< 0.005	0.01	0.25	257

Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.16	0.00	0.00	0.05	0.05	0.00	0.01	0.01	—	42.1	42.1	< 0.005	< 0.005	0.04	42.6
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.28. Architectural Coating (2031) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.10	0.78	1.10	< 0.005	0.01	—	0.01	0.01	—	0.01	—	134	134	0.01	< 0.005	—	134
Architectural Coatings	170	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01	0.04	0.06	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	7.32	7.32	< 0.005	< 0.005	—	7.34
Architectural Coatings	9.30	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	0.01	0.01	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	1.21	1.21	< 0.005	< 0.005	—	1.22
Architectural Coatings	1.70	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	1.03	0.65	9.27	0.00	0.00	2.79	2.79	0.00	0.65	0.65	—	2,500	2,500	0.05	0.11	0.15	2,535
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.06	0.04	0.53	0.00	0.00	0.15	0.15	0.00	0.04	0.04	—	139	139	< 0.005	0.01	0.14	141
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.10	0.00	0.00	0.03	0.03	0.00	0.01	0.01	—	23.0	23.0	< 0.005	< 0.005	0.02	23.3
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

4. Operations Emissions Details

4.1. Mobile Emissions by Land Use

4.1.1. Unmitigated

Mobile source emissions results are presented in Sections 2.6. No further detailed breakdown of emissions is available.

4.1.2. Mitigated

Mobile source emissions results are presented in Sections 2.5. No further detailed breakdown of emissions is available.

4.2. Energy

4.2.1. Electricity Emissions By Land Use - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	2,296	2,296	0.14	0.02	—	2,305
Apartments High Rise	—	—	—	—	—	—	—	—	—	—	—	13,884	13,884	0.86	0.10	—	13,936
Condo/Townhouse	—	—	—	—	—	—	—	—	—	—	—	3,074	3,074	0.19	0.02	—	3,086
Total	—	—	—	—	—	—	—	—	—	—	—	19,254	19,254	1.19	0.14	—	19,327
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	2,296	2,296	0.14	0.02	—	2,305
Apartments High Rise	—	—	—	—	—	—	—	—	—	—	—	13,884	13,884	0.86	0.10	—	13,936

Condo/Townhouse	—	—	—	—	—	—	—	—	—	—	—	3,074	3,074	0.19	0.02	—	3,086
Total	—	—	—	—	—	—	—	—	—	—	—	19,254	19,254	1.19	0.14	—	19,327
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	380	380	0.02	< 0.005	—	382
Apartments High Rise	—	—	—	—	—	—	—	—	—	—	—	2,299	2,299	0.14	0.02	—	2,307
Condo/Townhouse	—	—	—	—	—	—	—	—	—	—	—	509	509	0.03	< 0.005	—	511
Total	—	—	—	—	—	—	—	—	—	—	—	3,188	3,188	0.20	0.02	—	3,200

4.2.2. Electricity Emissions By Land Use - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	2,296	2,296	0.14	0.02	—	2,305
Apartments High Rise	—	—	—	—	—	—	—	—	—	—	—	13,884	13,884	0.86	0.10	—	13,936
Condo/Townhouse	—	—	—	—	—	—	—	—	—	—	—	3,074	3,074	0.19	0.02	—	3,086
Total	—	—	—	—	—	—	—	—	—	—	—	19,254	19,254	1.19	0.14	—	19,327

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	2,296	2,296	0.14	0.02	—	2,305
Apartments High Rise	—	—	—	—	—	—	—	—	—	—	—	13,884	13,884	0.86	0.10	—	13,936
Condo/Townhouse	—	—	—	—	—	—	—	—	—	—	—	3,074	3,074	0.19	0.02	—	3,086
Total	—	—	—	—	—	—	—	—	—	—	—	19,254	19,254	1.19	0.14	—	19,327
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	380	380	0.02	< 0.005	—	382
Apartments High Rise	—	—	—	—	—	—	—	—	—	—	—	2,299	2,299	0.14	0.02	—	2,307
Condo/Townhouse	—	—	—	—	—	—	—	—	—	—	—	509	509	0.03	< 0.005	—	511
Total	—	—	—	—	—	—	—	—	—	—	—	3,188	3,188	0.20	0.02	—	3,200

4.2.3. Natural Gas Emissions By Land Use - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	0.10	1.64	0.70	0.01	0.13	—	0.13	0.13	—	0.13	—	2,076	2,076	0.18	< 0.005	—	2,082

Apartme High Rise	0.36	6.15	2.62	0.04	0.50	—	0.50	0.50	—	0.50	—	7,807	7,807	0.69	0.01	—	7,828
Condo/T ownhous e	0.12	2.07	0.88	0.01	0.17	—	0.17	0.17	—	0.17	—	2,627	2,627	0.23	< 0.005	—	2,634
Total	0.58	9.86	4.19	0.06	0.80	—	0.80	0.80	—	0.80	—	12,509	12,509	1.11	0.02	—	12,544
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	0.10	1.64	0.70	0.01	0.13	—	0.13	0.13	—	0.13	—	2,076	2,076	0.18	< 0.005	—	2,082
Apartme nts High Rise	0.36	6.15	2.62	0.04	0.50	—	0.50	0.50	—	0.50	—	7,807	7,807	0.69	0.01	—	7,828
Condo/T ownhous e	0.12	2.07	0.88	0.01	0.17	—	0.17	0.17	—	0.17	—	2,627	2,627	0.23	< 0.005	—	2,634
Total	0.58	9.86	4.19	0.06	0.80	—	0.80	0.80	—	0.80	—	12,509	12,509	1.11	0.02	—	12,544
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	0.02	0.30	0.13	< 0.005	0.02	—	0.02	0.02	—	0.02	—	344	344	0.03	< 0.005	—	345
Apartme nts High Rise	0.07	1.12	0.48	0.01	0.09	—	0.09	0.09	—	0.09	—	1,292	1,292	0.11	< 0.005	—	1,296
Condo/T ownhous e	0.02	0.38	0.16	< 0.005	0.03	—	0.03	0.03	—	0.03	—	435	435	0.04	< 0.005	—	436
Total	0.11	1.80	0.77	0.01	0.15	—	0.15	0.15	—	0.15	—	2,071	2,071	0.18	< 0.005	—	2,077

4.2.4. Natural Gas Emissions By Land Use - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	0.10	1.64	0.70	0.01	0.13	—	0.13	0.13	—	0.13	—	2,076	2,076	0.18	< 0.005	—	2,082
Apartments High Rise	0.36	6.15	2.62	0.04	0.50	—	0.50	0.50	—	0.50	—	7,807	7,807	0.69	0.01	—	7,828
Condo/Townhouse	0.12	2.07	0.88	0.01	0.17	—	0.17	0.17	—	0.17	—	2,627	2,627	0.23	< 0.005	—	2,634
Total	0.58	9.86	4.19	0.06	0.80	—	0.80	0.80	—	0.80	—	12,509	12,509	1.11	0.02	—	12,544
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	0.10	1.64	0.70	0.01	0.13	—	0.13	0.13	—	0.13	—	2,076	2,076	0.18	< 0.005	—	2,082
Apartments High Rise	0.36	6.15	2.62	0.04	0.50	—	0.50	0.50	—	0.50	—	7,807	7,807	0.69	0.01	—	7,828
Condo/Townhouse	0.12	2.07	0.88	0.01	0.17	—	0.17	0.17	—	0.17	—	2,627	2,627	0.23	< 0.005	—	2,634
Total	0.58	9.86	4.19	0.06	0.80	—	0.80	0.80	—	0.80	—	12,509	12,509	1.11	0.02	—	12,544
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	0.02	0.30	0.13	< 0.005	0.02	—	0.02	0.02	—	0.02	—	344	344	0.03	< 0.005	—	345
Apartments High Rise	0.07	1.12	0.48	0.01	0.09	—	0.09	0.09	—	0.09	—	1,292	1,292	0.11	< 0.005	—	1,296

Condo/Townhous	0.02	0.38	0.16	< 0.005	0.03	—	0.03	0.03	—	0.03	—	435	435	0.04	< 0.005	—	436
Total	0.11	1.80	0.77	0.01	0.15	—	0.15	0.15	—	0.15	—	2,071	2,071	0.18	< 0.005	—	2,077

4.3. Area Emissions by Source

4.3.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Source	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Consumer Products	63.8	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	5.12	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Landscape Equipment	14.0	1.49	162	0.01	0.07	—	0.07	0.05	—	0.05	—	432	432	0.02	< 0.005	—	434
Total	83.0	1.49	162	0.01	0.07	—	0.07	0.05	—	0.05	—	432	432	0.02	< 0.005	—	434
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Consumer Products	63.8	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	5.12	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	69.0	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Consum Products	11.7	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	0.93	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Landscape Equipment	1.75	0.19	20.3	< 0.005	0.01	—	0.01	0.01	—	0.01	—	49.0	49.0	< 0.005	< 0.005	—	49.2
Total	14.3	0.19	20.3	< 0.005	0.01	—	0.01	0.01	—	0.01	—	49.0	49.0	< 0.005	< 0.005	—	49.2

4.3.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Source	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Consumer Products	59.1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	2.05	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Landscape Equipment	14.0	1.49	162	0.01	0.07	—	0.07	0.05	—	0.05	—	432	432	0.02	< 0.005	—	434
Total	75.1	1.49	162	0.01	0.07	—	0.07	0.05	—	0.05	—	432	432	0.02	< 0.005	—	434
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Consumer Products	59.1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Architectural Coatings	2.05	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	61.1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Consumer Products	10.8	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	0.37	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Landscape Equipment	1.75	0.19	20.3	< 0.005	0.01	—	0.01	0.01	—	0.01	—	49.0	49.0	< 0.005	< 0.005	—	49.2
Total	12.9	0.19	20.3	< 0.005	0.01	—	0.01	0.01	—	0.01	—	49.0	49.0	< 0.005	< 0.005	—	49.2

4.4. Water Emissions by Land Use

4.4.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	16.5	454	470	1.72	0.04	—	526
Apartments High Rise	—	—	—	—	—	—	—	—	—	—	176	913	1,089	18.1	0.44	—	1,672
Condo/Townhouse	—	—	—	—	—	—	—	—	—	—	34.7	180	215	3.57	0.09	—	330

Total	—	—	—	—	—	—	—	—	—	—	228	1,546	1,774	23.4	0.57	—	2,528
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	16.5	454	470	1.72	0.04	—	526
Apartments High Rise	—	—	—	—	—	—	—	—	—	—	176	913	1,089	18.1	0.44	—	1,672
Condo/Townhouse	—	—	—	—	—	—	—	—	—	—	34.7	180	215	3.57	0.09	—	330
Total	—	—	—	—	—	—	—	—	—	—	228	1,546	1,774	23.4	0.57	—	2,528
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	2.74	75.1	77.8	0.29	0.01	—	87.1
Apartments High Rise	—	—	—	—	—	—	—	—	—	—	29.2	151	180	3.00	0.07	—	277
Condo/Townhouse	—	—	—	—	—	—	—	—	—	—	5.75	29.8	35.5	0.59	0.01	—	54.6
Total	—	—	—	—	—	—	—	—	—	—	37.7	256	294	3.88	0.09	—	419

4.4.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Single Family Housing	—	—	—	—	—	—	—	—	—	—	16.5	454	470	1.72	0.04	—	526
Apartments High Rise	—	—	—	—	—	—	—	—	—	—	176	913	1,089	18.1	0.44	—	1,672
Condo/Townhouse	—	—	—	—	—	—	—	—	—	—	34.7	180	215	3.57	0.09	—	330
Total	—	—	—	—	—	—	—	—	—	—	228	1,546	1,774	23.4	0.57	—	2,528
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	16.5	454	470	1.72	0.04	—	526
Apartments High Rise	—	—	—	—	—	—	—	—	—	—	176	913	1,089	18.1	0.44	—	1,672
Condo/Townhouse	—	—	—	—	—	—	—	—	—	—	34.7	180	215	3.57	0.09	—	330
Total	—	—	—	—	—	—	—	—	—	—	228	1,546	1,774	23.4	0.57	—	2,528
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	2.74	75.1	77.8	0.29	0.01	—	87.1
Apartments High Rise	—	—	—	—	—	—	—	—	—	—	29.2	151	180	3.00	0.07	—	277
Condo/Townhouse	—	—	—	—	—	—	—	—	—	—	5.75	29.8	35.5	0.59	0.01	—	54.6
Total	—	—	—	—	—	—	—	—	—	—	37.7	256	294	3.88	0.09	—	419

4.5. Waste Emissions by Land Use

4.5.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	108	0.00	108	10.8	0.00	—	377
Apartments High Rise	—	—	—	—	—	—	—	—	—	—	880	0.00	880	87.9	0.00	—	3,077
Condo/Townhouse	—	—	—	—	—	—	—	—	—	—	173	0.00	173	17.3	0.00	—	607
Total	—	—	—	—	—	—	—	—	—	—	1,161	0.00	1,161	116	0.00	—	4,061
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	108	0.00	108	10.8	0.00	—	377
Apartments High Rise	—	—	—	—	—	—	—	—	—	—	880	0.00	880	87.9	0.00	—	3,077
Condo/Townhouse	—	—	—	—	—	—	—	—	—	—	173	0.00	173	17.3	0.00	—	607
Total	—	—	—	—	—	—	—	—	—	—	1,161	0.00	1,161	116	0.00	—	4,061
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Single Family Housing	—	—	—	—	—	—	—	—	—	—	17.8	0.00	17.8	1.78	0.00	—	62.4
Apartments High Rise	—	—	—	—	—	—	—	—	—	—	146	0.00	146	14.6	0.00	—	509
Condo/Townhouse	—	—	—	—	—	—	—	—	—	—	28.7	0.00	28.7	2.87	0.00	—	100
Total	—	—	—	—	—	—	—	—	—	—	192	0.00	192	19.2	0.00	—	672

4.5.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	108	0.00	108	10.8	0.00	—	377
Apartments High Rise	—	—	—	—	—	—	—	—	—	—	880	0.00	880	87.9	0.00	—	3,077
Condo/Townhouse	—	—	—	—	—	—	—	—	—	—	173	0.00	173	17.3	0.00	—	607
Total	—	—	—	—	—	—	—	—	—	—	1,161	0.00	1,161	116	0.00	—	4,061
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	108	0.00	108	10.8	0.00	—	377

Apartments High Rise	—	—	—	—	—	—	—	—	—	—	880	0.00	880	87.9	0.00	—	3,077
Condo/Townhouse	—	—	—	—	—	—	—	—	—	—	173	0.00	173	17.3	0.00	—	607
Total	—	—	—	—	—	—	—	—	—	—	1,161	0.00	1,161	116	0.00	—	4,061
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	17.8	0.00	17.8	1.78	0.00	—	62.4
Apartments High Rise	—	—	—	—	—	—	—	—	—	—	146	0.00	146	14.6	0.00	—	509
Condo/Townhouse	—	—	—	—	—	—	—	—	—	—	28.7	0.00	28.7	2.87	0.00	—	100
Total	—	—	—	—	—	—	—	—	—	—	192	0.00	192	19.2	0.00	—	672

4.6. Refrigerant Emissions by Land Use

4.6.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2.89	2.89
Apartments High Rise	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	15.2	15.2

Condo/Townhous	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	3.30	3.30
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	21.4	21.4
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2.89	2.89
Apartments High Rise	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	15.2	15.2
Condo/Townhouse	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	3.30	3.30
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	21.4	21.4
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.48	0.48
Apartments High Rise	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2.51	2.51
Condo/Townhouse	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.55	0.55
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	3.54	3.54

4.6.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2.89	2.89
Apartments High Rise	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	15.2	15.2
Condo/Townhouse	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	3.30	3.30
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	21.4	21.4
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2.89	2.89
Apartments High Rise	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	15.2	15.2
Condo/Townhouse	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	3.30	3.30
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	21.4	21.4
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.48	0.48
Apartments High Rise	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2.51	2.51
Condo/Townhouse	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.55	0.55
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	3.54	3.54

4.7. Offroad Emissions By Equipment Type

4.7.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.7.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.8. Stationary Emissions By Equipment Type

4.8.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.8.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.9. User Defined Emissions By Equipment Type

4.9.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.9.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10. Soil Carbon Accumulation By Vegetation Type

4.10.1. Soil Carbon Accumulation By Vegetation Type - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Vegetation	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.2. Above and Belowground Carbon Accumulation by Land Use Type - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.3. Avoided and Sequestered Emissions by Species - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Species	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.4. Soil Carbon Accumulation By Vegetation Type - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Vegetation	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.5. Above and Belowground Carbon Accumulation by Land Use Type - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.6. Avoided and Sequestered Emissions by Species - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Species	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

5. Activity Data

5.1. Construction Schedule

Phase Name	Phase Type	Start Date	End Date	Days Per Week	Work Days per Phase	Phase Description
Demolition	Demolition	2/1/2023	6/20/2023	5.00	100	—
Site Preparation	Site Preparation	6/21/2023	9/12/2023	5.00	60.0	—
Grading	Grading	9/13/2023	4/16/2024	5.00	155	—
Building Construction	Building Construction	4/17/2024	3/26/2030	5.00	1,550	—
Paving	Paving	3/27/2030	8/27/2030	5.00	110	—
Architectural Coating	Architectural Coating	8/28/2030	1/28/2031	5.00	110	—

5.2. Off-Road Equipment

5.2.1. Unmitigated

Phase Name	Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor
Demolition	Concrete/Industrial Saws	Diesel	Average	1.00	8.00	33.0	0.73
Demolition	Excavators	Diesel	Average	3.00	8.00	36.0	0.38
Demolition	Rubber Tired Dozers	Diesel	Average	2.00	8.00	367	0.40
Site Preparation	Rubber Tired Dozers	Diesel	Average	3.00	8.00	367	0.40
Site Preparation	Tractors/Loaders/Backhoes	Diesel	Average	4.00	8.00	84.0	0.37
Grading	Excavators	Diesel	Average	2.00	8.00	36.0	0.38
Grading	Graders	Diesel	Average	1.00	8.00	148	0.41
Grading	Rubber Tired Dozers	Diesel	Average	1.00	8.00	367	0.40
Grading	Scrapers	Diesel	Average	2.00	8.00	423	0.48
Grading	Tractors/Loaders/Backhoes	Diesel	Average	2.00	8.00	84.0	0.37
Building Construction	Cranes	Diesel	Average	1.00	7.00	367	0.29
Building Construction	Forklifts	Diesel	Average	3.00	8.00	82.0	0.20
Building Construction	Generator Sets	Diesel	Average	1.00	8.00	14.0	0.74
Building Construction	Tractors/Loaders/Backhoes	Diesel	Average	3.00	7.00	84.0	0.37
Building Construction	Welders	Diesel	Average	1.00	8.00	46.0	0.45
Paving	Pavers	Diesel	Average	2.00	8.00	81.0	0.42
Paving	Paving Equipment	Diesel	Average	2.00	8.00	89.0	0.36
Paving	Rollers	Diesel	Average	2.00	8.00	36.0	0.38
Architectural Coating	Air Compressors	Diesel	Average	1.00	6.00	37.0	0.48

5.2.2. Mitigated

Phase Name	Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor
Demolition	Concrete/Industrial Saws	Diesel	Average	1.00	8.00	33.0	0.73
Demolition	Excavators	Diesel	Average	3.00	8.00	36.0	0.38
Demolition	Rubber Tired Dozers	Diesel	Average	2.00	8.00	367	0.40
Site Preparation	Rubber Tired Dozers	Diesel	Average	3.00	8.00	367	0.40
Site Preparation	Tractors/Loaders/Backhoes	Diesel	Average	4.00	8.00	84.0	0.37
Grading	Excavators	Diesel	Average	2.00	8.00	36.0	0.38
Grading	Graders	Diesel	Average	1.00	8.00	148	0.41
Grading	Rubber Tired Dozers	Diesel	Average	1.00	8.00	367	0.40
Grading	Scrapers	Diesel	Average	2.00	8.00	423	0.48
Grading	Tractors/Loaders/Backhoes	Diesel	Average	2.00	8.00	84.0	0.37
Building Construction	Cranes	Diesel	Average	1.00	7.00	367	0.29
Building Construction	Forklifts	Diesel	Average	3.00	8.00	82.0	0.20
Building Construction	Generator Sets	Diesel	Average	1.00	8.00	14.0	0.74
Building Construction	Tractors/Loaders/Backhoes	Diesel	Average	3.00	7.00	84.0	0.37
Building Construction	Welders	Diesel	Average	1.00	8.00	46.0	0.45
Paving	Pavers	Diesel	Average	2.00	8.00	81.0	0.42
Paving	Paving Equipment	Diesel	Average	2.00	8.00	89.0	0.36
Paving	Rollers	Diesel	Average	2.00	8.00	36.0	0.38
Architectural Coating	Air Compressors	Diesel	Average	1.00	6.00	37.0	0.48

5.3. Construction Vehicles

5.3.1. Unmitigated

Phase Name	Trip Type	One-Way Trips per Day	Miles per Trip	Vehicle Mix
Demolition	—	—	—	—

Demolition	Worker	15.0	18.5	LDA,LDT1,LDT2
Demolition	Vendor	—	10.2	HHDT,MHDT
Demolition	Hauling	0.00	20.0	HHDT
Demolition	Onsite truck	—	—	HHDT
Site Preparation	—	—	—	—
Site Preparation	Worker	17.5	18.5	LDA,LDT1,LDT2
Site Preparation	Vendor	—	10.2	HHDT,MHDT
Site Preparation	Hauling	0.00	20.0	HHDT
Site Preparation	Onsite truck	—	—	HHDT
Grading	—	—	—	—
Grading	Worker	20.0	18.5	LDA,LDT1,LDT2
Grading	Vendor	—	10.2	HHDT,MHDT
Grading	Hauling	0.00	20.0	HHDT
Grading	Onsite truck	—	—	HHDT
Building Construction	—	—	—	—
Building Construction	Worker	1,977	18.5	LDA,LDT1,LDT2
Building Construction	Vendor	305	10.2	HHDT,MHDT
Building Construction	Hauling	0.00	20.0	HHDT
Building Construction	Onsite truck	—	—	HHDT
Paving	—	—	—	—
Paving	Worker	15.0	18.5	LDA,LDT1,LDT2
Paving	Vendor	—	10.2	HHDT,MHDT
Paving	Hauling	0.00	20.0	HHDT
Paving	Onsite truck	—	—	HHDT
Architectural Coating	—	—	—	—
Architectural Coating	Worker	395	18.5	LDA,LDT1,LDT2
Architectural Coating	Vendor	—	10.2	HHDT,MHDT
Architectural Coating	Hauling	0.00	20.0	HHDT

Architectural Coating	Onsite truck	—	—	HHDT

5.3.2. Mitigated

Phase Name	Trip Type	One-Way Trips per Day	Miles per Trip	Vehicle Mix
Demolition	—	—	—	—
Demolition	Worker	15.0	10.0	LDA,LDT1,LDT2
Demolition	Vendor	—	10.2	HHDT,MHDT
Demolition	Hauling	0.00	20.0	HHDT
Demolition	Onsite truck	—	—	HHDT
Site Preparation	—	—	—	—
Site Preparation	Worker	17.5	10.0	LDA,LDT1,LDT2
Site Preparation	Vendor	—	10.2	HHDT,MHDT
Site Preparation	Hauling	0.00	20.0	HHDT
Site Preparation	Onsite truck	—	—	HHDT
Grading	—	—	—	—
Grading	Worker	20.0	10.0	LDA,LDT1,LDT2
Grading	Vendor	—	10.2	HHDT,MHDT
Grading	Hauling	0.00	20.0	HHDT
Grading	Onsite truck	—	—	HHDT
Building Construction	—	—	—	—
Building Construction	Worker	1,977	10.0	LDA,LDT1,LDT2
Building Construction	Vendor	305	10.2	HHDT,MHDT
Building Construction	Hauling	0.00	20.0	HHDT
Building Construction	Onsite truck	—	—	HHDT
Paving	—	—	—	—
Paving	Worker	15.0	10.0	LDA,LDT1,LDT2
Paving	Vendor	—	10.2	HHDT,MHDT
Paving	Hauling	0.00	20.0	HHDT

Paving	Onsite truck	—	—	HHDT
Architectural Coating	—	—	—	—
Architectural Coating	Worker	395	10.0	LDA,LDT1,LDT2
Architectural Coating	Vendor	—	10.2	HHDT,MHDT
Architectural Coating	Hauling	0.00	20.0	HHDT
Architectural Coating	Onsite truck	—	—	HHDT

5.4. Vehicles

5.4.1. Construction Vehicle Control Strategies

Non-applicable. No control strategies activated by user.

5.5. Architectural Coatings

Phase Name	Residential Interior Area Coated (sq ft)	Residential Exterior Area Coated (sq ft)	Non-Residential Interior Area Coated (sq ft)	Non-Residential Exterior Area Coated (sq ft)	Parking Area Coated (sq ft)
Architectural Coating	6,041,527	2,013,842	0.00	0.00	—

5.6. Dust Mitigation

5.6.1. Construction Earthmoving Activities

Phase Name	Material Imported (cy)	Material Exported (cy)	Acres Graded (acres)	Material Demolished (sq. ft.)	Acres Paved (acres)
Demolition	0.00	0.00	0.00	—	—
Site Preparation	—	—	90.0	0.00	—
Grading	—	—	465	0.00	—
Paving	0.00	0.00	0.00	0.00	2.28

5.6.2. Construction Earthmoving Control Strategies

Control Strategies Applied	Frequency (per day)	PM10 Reduction	PM2.5 Reduction
Water Exposed Area	2	61%	61%

5.7. Construction Paving

Land Use	Area Paved (acres)	% Asphalt
Single Family Housing	2.28	0%
Apartments High Rise	—	0%
Condo/Townhouse	—	0%

5.8. Construction Electricity Consumption and Emissions Factors

kWh per Year and Emission Factor (lb/MWh)

Year	kWh per Year	CO2	CH4	N2O
2023	0.00	532	0.03	< 0.005
2024	0.00	532	0.03	< 0.005
2025	0.00	532	0.03	< 0.005
2026	0.00	532	0.03	< 0.005
2027	0.00	532	0.03	< 0.005
2028	0.00	532	0.03	< 0.005
2029	0.00	532	0.03	< 0.005
2030	0.00	532	0.03	< 0.005
2031	0.00	532	0.03	< 0.005

5.9. Operational Mobile Sources

5.9.1. Unmitigated

Land Use Type	Trips/Weekday	Trips/Saturday	Trips/Sunday	Trips/Year	VMT/Weekday	VMT/Saturday	VMT/Sunday	VMT/Year
Total all Land Uses	14,042	14,042	14,042	5,125,330	149,691	149,691	149,691	54,637,187

5.9.2. Mitigated

Land Use Type	Trips/Weekday	Trips/Saturday	Trips/Sunday	Trips/Year	VMT/Weekday	VMT/Saturday	VMT/Sunday	VMT/Year

Total all Land Uses	14,014	14,014	14,014	5,115,079	149,392	149,392	149,392	54,527,913

5.10. Operational Area Sources

5.10.1. Hearths

5.10.1.1. Unmitigated

5.10.1.2. Mitigated

5.10.2. Architectural Coatings

Residential Interior Area Coated (sq ft)	Residential Exterior Area Coated (sq ft)	Non-Residential Interior Area Coated (sq ft)	Non-Residential Exterior Area Coated (sq ft)	Parking Area Coated (sq ft)
6041526.75	2,013,842	0.00	0.00	—

5.10.3. Landscape Equipment

Season	Unit	Value
Snow Days	day/yr	0.00
Summer Days	day/yr	250

5.10.4. Landscape Equipment - Mitigated

Season	Unit	Value
Snow Days	day/yr	0.00
Summer Days	day/yr	250

5.11. Operational Energy Consumption

5.11.1. Unmitigated

Electricity (kWh/yr) and CO2 and CH4 and N2O and Natural Gas (kBTU/yr)

Land Use	Electricity (kWh/yr)	CO2	CH4	N2O	Natural Gas (kBTU/yr)
Single Family Housing	1,575,192	532	0.0330	0.0040	6,476,971
Apartments High Rise	9,525,770	532	0.0330	0.0040	24,359,055
Condo/Townhouse	2,109,126	532	0.0330	0.0040	8,196,399

5.11.2. Mitigated

Electricity (kWh/yr) and CO2 and CH4 and N2O and Natural Gas (kBTU/yr)

Land Use	Electricity (kWh/yr)	CO2	CH4	N2O	Natural Gas (kBTU/yr)
Single Family Housing	1,575,192	532	0.0330	0.0040	6,476,971
Apartments High Rise	9,525,770	532	0.0330	0.0040	24,359,055
Condo/Townhouse	2,109,126	532	0.0330	0.0040	8,196,399

5.12. Operational Water and Wastewater Consumption

5.12.1. Unmitigated

Land Use	Indoor Water (gal/year)	Outdoor Water (gal/year)
Single Family Housing	8,628,003	47,588,841
Apartments High Rise	91,990,353	0.00
Condo/Townhouse	18,131,311	0.00

5.12.2. Mitigated

Land Use	Indoor Water (gal/year)	Outdoor Water (gal/year)
Single Family Housing	8,628,003	47,588,841
Apartments High Rise	91,990,353	0.00
Condo/Townhouse	18,131,311	0.00

5.13. Operational Waste Generation

5.13.1. Unmitigated

Land Use	Waste (ton/year)	Cogeneration (kWh/year)
Single Family Housing	200	—
Apartments High Rise	1,632	—
Condo/Townhouse	322	—

5.13.2. Mitigated

Land Use	Waste (ton/year)	Cogeneration (kWh/year)
Single Family Housing	200	—
Apartments High Rise	1,632	—
Condo/Townhouse	322	—

5.14. Operational Refrigeration and Air Conditioning Equipment

5.14.1. Unmitigated

Land Use Type	Equipment Type	Refrigerant	GWP	Quantity (kg)	Operations Leak Rate	Service Leak Rate	Times Serviced
Single Family Housing	Average room A/C & Other residential A/C and heat pumps	R-410A	2,088	< 0.005	2.50	2.50	10.0
Single Family Housing	Household refrigerators and/or freezers	R-134a	1,430	0.12	0.60	0.00	1.00
Apartments High Rise	Average room A/C & Other residential A/C and heat pumps	R-410A	2,088	< 0.005	2.50	2.50	10.0
Apartments High Rise	Household refrigerators and/or freezers	R-134a	1,430	0.12	0.60	0.00	1.00
Condo/Townhouse	Average room A/C & Other residential A/C and heat pumps	R-410A	2,088	< 0.005	2.50	2.50	10.0

Condo/Townhouse	Household refrigerators and/or freezers	R-134a	1,430	0.12	0.60	0.00	1.00

5.14.2. Mitigated

Land Use Type	Equipment Type	Refrigerant	GWP	Quantity (kg)	Operations Leak Rate	Service Leak Rate	Times Serviced
Single Family Housing	Average room A/C & Other residential A/C and heat pumps	R-410A	2,088	< 0.005	2.50	2.50	10.0
Single Family Housing	Household refrigerators and/or freezers	R-134a	1,430	0.12	0.60	0.00	1.00
Apartments High Rise	Average room A/C & Other residential A/C and heat pumps	R-410A	2,088	< 0.005	2.50	2.50	10.0
Apartments High Rise	Household refrigerators and/or freezers	R-134a	1,430	0.12	0.60	0.00	1.00
Condo/Townhouse	Average room A/C & Other residential A/C and heat pumps	R-410A	2,088	< 0.005	2.50	2.50	10.0
Condo/Townhouse	Household refrigerators and/or freezers	R-134a	1,430	0.12	0.60	0.00	1.00

5.15. Operational Off-Road Equipment

5.15.1. Unmitigated

Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor

5.15.2. Mitigated

Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor

5.16. Stationary Sources

5.16.1. Emergency Generators and Fire Pumps

Equipment Type	Fuel Type	Number per Day	Hours per Day	Hours per Year	Horsepower	Load Factor

5.16.2. Process Boilers

Equipment Type	Fuel Type	Number	Boiler Rating (MMBtu/hr)	Daily Heat Input (MMBtu/day)	Annual Heat Input (MMBtu/yr)

5.17. User Defined

Equipment Type	Fuel Type
—	—

5.18. Vegetation

5.18.1. Land Use Change

5.18.1.1. Unmitigated

Vegetation Land Use Type	Vegetation Soil Type	Initial Acres	Final Acres

5.18.1.2. Mitigated

Vegetation Land Use Type	Vegetation Soil Type	Initial Acres	Final Acres

5.18.1. Biomass Cover Type

5.18.1.1. Unmitigated

Biomass Cover Type	Initial Acres	Final Acres

5.18.1.2. Mitigated

Biomass Cover Type	Initial Acres	Final Acres

5.18.2. Sequestration

5.18.2.1. Unmitigated

Tree Type	Number	Electricity Saved (kWh/year)	Natural Gas Saved (btu/year)

5.18.2.2. Mitigated

Tree Type	Number	Electricity Saved (kWh/year)	Natural Gas Saved (btu/year)

6. Climate Risk Detailed Report

6.1. Climate Risk Summary

Cal-Adapt midcentury 2040–2059 average projections for four hazards are reported below for your project location. These are under Representation Concentration Pathway (RCP) 8.5 which assumes GHG emissions will continue to rise strongly through 2050 and then plateau around 2100.

Climate Hazard	Result for Project Location	Unit
Temperature and Extreme Heat	16.9	annual days of extreme heat
Extreme Precipitation	5.05	annual days with precipitation above 20 mm
Sea Level Rise	0.00	meters of inundation depth
Wildfire	0.00	annual hectares burned

Temperature and Extreme Heat data are for grid cell in which your project are located. The projection is based on the 98th historical percentile of daily maximum/minimum temperatures from observed historical data (32 climate model ensemble from Cal-Adapt, 2040–2059 average under RCP 8.5). Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.
Extreme Precipitation data are for the grid cell in which your project are located. The threshold of 20 mm is equivalent to about ¾ an inch of rain, which would be light to moderate rainfall if received over a full day or heavy rain if received over a period of 2 to 4 hours. Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.
Sea Level Rise data are for the grid cell in which your project are located. The projections are from Radke et al. (2017), as reported in Cal-Adapt (Radke et al., 2017, CEC-500-2017-008), and consider inundation location and depth for the San Francisco Bay, the Sacramento-San Joaquin River Delta and California coast resulting different increments of sea level rise coupled with extreme storm events. Users may select from four scenarios to view the range in potential inundation depth for the grid cell. The four scenarios are: No rise, 0.5 meter, 1.0 meter, 1.41 meters

Wildfire data are for the grid cell in which your project are located. The projections are from UC Davis, as reported in Cal-Adapt (2040–2059 average under RCP 8.5), and consider historical data of climate, vegetation, population density, and large (> 400 ha) fire history. Users may select from four model simulations to view the range in potential wildfire probabilities for the grid cell. The four simulations make different assumptions about expected rainfall and temperature are: Warmer/drier (HadGEM2-ES), Cooler/wetter (CNRM-CM5), Average conditions (CanESM2), Range of different rainfall and temperature possibilities (MIROC5). Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.

6.2. Initial Climate Risk Scores

Climate Hazard	Exposure Score	Sensitivity Score	Adaptive Capacity Score	Vulnerability Score
Temperature and Extreme Heat	2	0	0	N/A
Extreme Precipitation	N/A	N/A	N/A	N/A
Sea Level Rise	1	0	0	N/A
Wildfire	1	0	0	N/A
Flooding	N/A	N/A	N/A	N/A
Drought	N/A	N/A	N/A	N/A
Snowpack Reduction	N/A	N/A	N/A	N/A
Air Quality Degradation	0	0	0	N/A

The sensitivity score reflects the extent to which a project would be adversely affected by exposure to a climate hazard. Exposure is rated on a scale of 1 to 5, with a score of 5 representing the greatest exposure.
The adaptive capacity of a project refers to its ability to manage and reduce vulnerabilities from projected climate hazards. Adaptive capacity is rated on a scale of 1 to 5, with a score of 5 representing the greatest ability to adapt.
The overall vulnerability scores are calculated based on the potential impacts and adaptive capacity assessments for each hazard. Scores do not include implementation of climate risk reduction measures.

6.3. Adjusted Climate Risk Scores

Climate Hazard	Exposure Score	Sensitivity Score	Adaptive Capacity Score	Vulnerability Score
Temperature and Extreme Heat	2	1	1	3
Extreme Precipitation	N/A	N/A	N/A	N/A
Sea Level Rise	1	1	1	2
Wildfire	1	1	1	2
Flooding	N/A	N/A	N/A	N/A
Drought	N/A	N/A	N/A	N/A
Snowpack Reduction	N/A	N/A	N/A	N/A
Air Quality Degradation	1	1	1	2

The sensitivity score reflects the extent to which a project would be adversely affected by exposure to a climate hazard. Exposure is rated on a scale of 1 to 5, with a score of 5 representing the greatest exposure.
The adaptive capacity of a project refers to its ability to manage and reduce vulnerabilities from projected climate hazards. Adaptive capacity is rated on a scale of 1 to 5, with a score of 5 representing the greatest ability to adapt.
The overall vulnerability scores are calculated based on the potential impacts and adaptive capacity assessments for each hazard. Scores include implementation of climate risk reduction measures.

6.4. Climate Risk Reduction Measures

7. Health and Equity Details

7.1. CalEnviroScreen 4.0 Scores

The maximum CalEnviroScreen score is 100. A high score (i.e., greater than 50) reflects a higher pollution burden compared to other census tracts in the state.

Indicator	Result for Project Census Tract
Exposure Indicators	—
AQ-Ozone	70.5
AQ-PM	91.4
AQ-DPM	27.5
Drinking Water	94.6
Lead Risk Housing	0.63
Pesticides	0.00
Toxic Releases	63.8
Traffic	64.2
Effect Indicators	—
CleanUp Sites	11.8
Groundwater	35.0
Haz Waste Facilities/Generators	77.0
Impaired Water Bodies	23.9
Solid Waste	0.00
Sensitive Population	—
Asthma	21.8

Cardio-vascular	54.2
Low Birth Weights	72.9
Socioeconomic Factor Indicators	—
Education	39.5
Housing	1.93
Linguistic	81.9
Poverty	17.2
Unemployment	33.6

7.2. Healthy Places Index Scores

The maximum Health Places Index score is 100. A high score (i.e., greater than 50) reflects healthier community conditions compared to other census tracts in the state.

Indicator	Result for Project Census Tract
Economic	—
Above Poverty	91.518029
Employed	85.29449506
Median HI	92.23662261
Education	—
Bachelor's or higher	82.16348005
High school enrollment	25.92069806
Preschool enrollment	79.32760169
Transportation	—
Auto Access	91.71050943
Active commuting	26.15167458
Social	—
2-parent households	63.95483126
Voting	60.09239061
Neighborhood	—
Alcohol availability	50.891826

Park access	55.78082895
Retail density	58.37289876
Supermarket access	43.94969845
Tree canopy	44.89926857
Housing	—
Homeownership	79.76389067
Housing habitability	95.05966893
Low-inc homeowner severe housing cost burden	93.13486462
Low-inc renter severe housing cost burden	89.06711151
Uncrowded housing	82.07365584
Health Outcomes	—
Insured adults	81.30373412
Arthritis	90.1
Asthma ER Admissions	79.0
High Blood Pressure	78.2
Cancer (excluding skin)	66.1
Asthma	95.7
Coronary Heart Disease	94.7
Chronic Obstructive Pulmonary Disease	95.5
Diagnosed Diabetes	80.8
Life Expectancy at Birth	52.7
Cognitively Disabled	92.5
Physically Disabled	93.4
Heart Attack ER Admissions	42.2
Mental Health Not Good	91.8
Chronic Kidney Disease	93.4
Obesity	95.5
Pedestrian Injuries	42.8

Physical Health Not Good	92.3
Stroke	93.8
Health Risk Behaviors	—
Binge Drinking	69.8
Current Smoker	91.5
No Leisure Time for Physical Activity	80.7
Climate Change Exposures	—
Wildfire Risk	0.0
SLR Inundation Area	0.0
Children	75.0
Elderly	81.3
English Speaking	49.4
Foreign-born	72.0
Outdoor Workers	84.9
Climate Change Adaptive Capacity	—
Impervious Surface Cover	80.2
Traffic Density	51.9
Traffic Access	23.0
Other Indices	—
Hardship	10.7
Other Decision Support	—
2016 Voting	73.0

7.3. Overall Health & Equity Scores

Metric	Result for Project Census Tract
CalEnviroScreen 4.0 Score for Project Location (a)	46.0
Healthy Places Index Score for Project Location (b)	87.0
Project Located in a Designated Disadvantaged Community (Senate Bill 535)	No

Project Located in a Low-Income Community (Assembly Bill 1550)	No
Project Located in a Community Air Protection Program Community (Assembly Bill 617)	No

a: The maximum CalEnviroScreen score is 100. A high score (i.e., greater than 50) reflects a higher pollution burden compared to other census tracts in the state.
b: The maximum Health Places Index score is 100. A high score (i.e., greater than 50) reflects healthier community conditions compared to other census tracts in the state.

7.4. Health & Equity Measures

No Health & Equity Measures selected.

7.5. Evaluation Scorecard

Health & Equity Evaluation Scorecard not completed.

7.6. Health & Equity Custom Measures

No Health & Equity Custom Measures created.

8. User Changes to Default Data

Screen	Justification
Land Use	Per project description
Operations: Vehicle Data	227,461 total trips per traffic analysis. Estimated as all Condo/Townhouse trips for simplicity.
Operations: Hearths	No woodstoves or fireplaces
Construction: Construction Phases	Phase lengths adjusted proportionally for 9 year construction schedule
Construction: Architectural Coatings	Mitigation
Operations: Architectural Coatings	Mitigation

Appendix B:

CalEEMod Mitigated Project Emission Output

Chino Hills General Plan - Project Mitigated Detailed Report

Table of Contents

1. Basic Project Information

1.1. Basic Project Information

1.2. Land Use Types

1.3. User-Selected Emission Reduction Measures by Emissions Sector

2. Emissions Summary

2.1. Construction Emissions Compared Against Thresholds

2.2. Construction Emissions by Year, Unmitigated

2.3. Construction Emissions by Year, Mitigated

2.4. Operations Emissions Compared Against Thresholds

2.5. Operations Emissions by Sector, Unmitigated

2.6. Operations Emissions by Sector, Mitigated

3. Construction Emissions Details

3.1. Demolition (2023) - Unmitigated

3.2. Demolition (2023) - Mitigated

3.3. Site Preparation (2023) - Unmitigated

3.4. Site Preparation (2023) - Mitigated

3.5. Grading (2023) - Unmitigated

3.6. Grading (2023) - Mitigated

3.7. Grading (2024) - Unmitigated

3.8. Grading (2024) - Mitigated

3.9. Building Construction (2024) - Unmitigated

3.10. Building Construction (2024) - Mitigated

3.11. Building Construction (2025) - Unmitigated

3.12. Building Construction (2025) - Mitigated

3.13. Building Construction (2026) - Unmitigated

3.14. Building Construction (2026) - Mitigated

3.15. Building Construction (2027) - Unmitigated

3.16. Building Construction (2027) - Mitigated

3.17. Building Construction (2028) - Unmitigated

3.18. Building Construction (2028) - Mitigated

3.19. Building Construction (2029) - Unmitigated

3.20. Building Construction (2029) - Mitigated

3.21. Building Construction (2030) - Unmitigated

3.22. Building Construction (2030) - Mitigated

3.23. Paving (2030) - Unmitigated

3.24. Paving (2030) - Mitigated

3.25. Architectural Coating (2030) - Unmitigated

3.26. Architectural Coating (2030) - Mitigated

3.27. Architectural Coating (2031) - Unmitigated

3.28. Architectural Coating (2031) - Mitigated

4. Operations Emissions Details

4.1. Mobile Emissions by Land Use

4.1.1. Unmitigated

4.1.2. Mitigated

4.2. Energy

4.2.1. Electricity Emissions By Land Use - Unmitigated

4.2.2. Electricity Emissions By Land Use - Mitigated

4.2.3. Natural Gas Emissions By Land Use - Unmitigated

4.2.4. Natural Gas Emissions By Land Use - Mitigated

4.3. Area Emissions by Source

4.3.1. Unmitigated

4.3.2. Mitigated

4.4. Water Emissions by Land Use

4.4.1. Unmitigated

4.4.2. Mitigated

4.5. Waste Emissions by Land Use

4.5.1. Unmitigated

4.5.2. Mitigated

4.6. Refrigerant Emissions by Land Use

4.6.1. Unmitigated

4.6.2. Mitigated

4.7. Offroad Emissions By Equipment Type

4.7.1. Unmitigated

4.7.2. Mitigated

4.8. Stationary Emissions By Equipment Type

4.8.1. Unmitigated

4.8.2. Mitigated

4.9. User Defined Emissions By Equipment Type

4.9.1. Unmitigated

4.9.2. Mitigated

4.10. Soil Carbon Accumulation By Vegetation Type

4.10.1. Soil Carbon Accumulation By Vegetation Type - Unmitigated

4.10.2. Above and Belowground Carbon Accumulation by Land Use Type - Unmitigated

4.10.3. Avoided and Sequestered Emissions by Species - Unmitigated

4.10.4. Soil Carbon Accumulation By Vegetation Type - Mitigated

4.10.5. Above and Belowground Carbon Accumulation by Land Use Type - Mitigated

4.10.6. Avoided and Sequestered Emissions by Species - Mitigated

5. Activity Data

5.1. Construction Schedule

5.2. Off-Road Equipment

5.2.1. Unmitigated

5.2.2. Mitigated

5.3. Construction Vehicles

5.3.1. Unmitigated

5.3.2. Mitigated

5.4. Vehicles

5.4.1. Construction Vehicle Control Strategies

5.5. Architectural Coatings

5.6. Dust Mitigation

5.6.1. Construction Earthmoving Activities

5.6.2. Construction Earthmoving Control Strategies

5.7. Construction Paving

5.8. Construction Electricity Consumption and Emissions Factors

5.9. Operational Mobile Sources

5.9.1. Unmitigated

5.9.2. Mitigated

5.10. Operational Area Sources

5.10.1. Hearths

5.10.1.1. Unmitigated

5.10.1.2. Mitigated

5.10.2. Architectural Coatings

5.10.3. Landscape Equipment

5.10.4. Landscape Equipment - Mitigated

5.11. Operational Energy Consumption

5.11.1. Unmitigated

5.11.2. Mitigated

5.12. Operational Water and Wastewater Consumption

5.12.1. Unmitigated

5.12.2. Mitigated

5.13. Operational Waste Generation

5.13.1. Unmitigated

5.13.2. Mitigated

5.14. Operational Refrigeration and Air Conditioning Equipment

5.14.1. Unmitigated

5.14.2. Mitigated

5.15. Operational Off-Road Equipment

5.15.1. Unmitigated

5.15.2. Mitigated

5.16. Stationary Sources

5.16.1. Emergency Generators and Fire Pumps

5.16.2. Process Boilers

5.17. User Defined

5.18. Vegetation

5.18.1. Land Use Change

5.18.1.1. Unmitigated

5.18.1.2. Mitigated

5.18.1. Biomass Cover Type

5.18.1.1. Unmitigated

5.18.1.2. Mitigated

5.18.2. Sequestration

5.18.2.1. Unmitigated

5.18.2.2. Mitigated

6. Climate Risk Detailed Report

6.1. Climate Risk Summary

6.2. Initial Climate Risk Scores

6.3. Adjusted Climate Risk Scores

6.4. Climate Risk Reduction Measures

7. Health and Equity Details

7.1. CalEnviroScreen 4.0 Scores

7.2. Healthy Places Index Scores

7.3. Overall Health & Equity Scores

7.4. Health & Equity Measures

7.5. Evaluation Scorecard

7.6. Health & Equity Custom Measures

8. User Changes to Default Data

1. Basic Project Information

1.1. Basic Project Information

Data Field	Value
Project Name	Chino Hills General Plan - Project Mitigated
Construction Start Date	10/1/2024
Operational Year	2040
Lead Agency	—
Land Use Scale	Plan/community
Analysis Level for Defaults	County
Windspeed (m/s)	2.60
Precipitation (days)	18.8
Location	Chino Hills, CA, USA
County	San Bernardino-South Coast
City	Chino Hills
Air District	South Coast AQMD
Air Basin	South Coast
TAZ	5201
EDFZ	10
Electric Utility	Southern California Edison
Gas Utility	Southern California Gas
App Version	2022.1.1.29

1.2. Land Use Types

Land Use Subtype	Size	Unit	Lot Acreage	Building Area (sq ft)	Landscape Area (sq ft)	Special Landscape Area (sq ft)	Population	Description
Single Family Housing	207	Dwelling Unit	67.2	403,650	2,424,561	—	685	—

Apartments High Rise	2,207	Dwelling Unit	35.6	2,118,720	0.00	—	7,305	—
Condo/Townhouse	435	Dwelling Unit	27.2	461,100	0.00	—	1,440	—

1.3. User-Selected Emission Reduction Measures by Emissions Sector

Sector	#	Measure Title
Construction	C-2*	Limit Heavy-Duty Diesel Vehicle Idling
Construction	C-3	Use Local Construction Contractors
Construction	C-4*	Use Local and Sustainable Building Materials
Transportation	T-4	Integrate A ordable and Below Market Rate Housing
Transportation	T-19-B	Construct or Improve Bike Boulevard
Waste	S-4*	Recycle Demolished Construction Material
Area Sources	AS-1	Use Low-VOC Cleaning Supplies
Area Sources	AS-2	Use Low-VOC Paints

* Qualitative or supporting measure. Emission reductions not included in the mitigated emissions results.

2. Emissions Summary

2.1. Construction Emissions Compared Against Thresholds

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Un/Mit.	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	69.3	39.8	186	0.09	1.81	28.4	29.1	1.66	6.78	7.37	—	40,405	40,405	2.03	2.42	140	41,318
Mit.	69.2	39.8	117	0.09	1.81	16.6	17.2	1.66	3.99	5.63	—	27,493	27,493	1.66	2.05	88.1	28,235
% Reduced	< 0.5%	< 0.5%	37%	—	—	42%	41%	—	41%	24%	—	32%	32%	18%	15%	37%	32%

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	69.2	37.4	145	0.09	1.59	28.4	29.1	1.47	6.78	7.37	—	38,035	38,035	2.08	2.42	3.64	38,813
Mit.	69.1	37.4	96.9	0.09	1.59	16.6	17.2	1.47	3.99	4.59	—	26,218	26,218	1.70	2.05	2.29	26,874
% Reduced	< 0.5%	< 0.5%	33%	—	—	42%	41%	—	41%	38%	—	31%	31%	18%	15%	37%	31%
Average Daily (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	18.4	24.4	101	0.07	0.97	20.1	20.5	0.89	4.79	5.16	—	26,924	26,924	1.45	1.73	40.1	27,516
Mit.	18.3	22.2	66.9	0.07	0.97	11.7	12.1	0.89	2.83	3.20	—	18,541	18,541	1.18	1.47	25.4	19,033
% Reduced	< 0.5%	9%	34%	—	—	42%	41%	—	41%	38%	—	31%	31%	18%	15%	37%	31%
Annual (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	3.36	4.46	18.4	0.01	0.18	3.67	3.74	0.16	0.87	0.94	—	4,458	4,458	0.24	0.29	6.63	4,556
Mit.	3.35	4.05	12.2	0.01	0.18	2.14	2.21	0.16	0.52	0.58	—	3,070	3,070	0.20	0.24	4.21	3,151
% Reduced	< 0.5%	9%	34%	—	—	42%	41%	—	41%	38%	—	31%	31%	18%	15%	37%	31%

2.2. Construction Emissions by Year, Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Year	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily - Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2023	4.04	39.8	37.1	0.06	1.81	7.89	9.70	1.66	3.99	5.65	—	6,892	6,892	0.28	0.06	1.26	6,919
2024	11.8	34.4	186	0.09	1.45	28.4	29.1	1.33	6.78	7.37	—	40,405	40,405	2.03	2.42	140	41,318
2025	10.5	29.6	173	0.09	0.57	28.4	29.0	0.53	6.78	7.31	—	39,647	39,647	1.98	2.42	130	40,548
2026	9.80	27.6	161	0.09	0.52	28.4	29.0	0.49	6.78	7.26	—	38,920	38,920	1.91	2.38	118	39,795
2027	9.37	25.8	151	0.09	0.47	28.4	28.9	0.45	6.78	7.22	—	38,199	38,199	1.05	2.31	106	39,020

2028	8.98	24.9	141	0.09	0.44	28.4	28.9	0.34	6.78	7.12	—	37,482	37,482	0.97	2.31	94.7	38,289
2029	8.56	23.3	132	0.09	0.34	28.4	28.8	0.32	6.78	7.10	—	36,774	36,774	0.92	2.24	84.3	37,549
2030	69.3	6.32	22.4	0.01	0.22	5.17	5.18	0.20	1.21	1.22	—	5,195	5,195	0.06	0.19	12.0	5,265
Daily - Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2023	3.82	37.4	32.8	0.06	1.59	3.85	5.45	1.47	1.49	2.95	—	6,867	6,867	0.28	0.06	0.03	6,893
2024	11.2	34.4	145	0.09	1.45	28.4	29.1	1.33	6.78	7.37	—	38,035	38,035	2.08	2.42	3.64	38,813
2025	9.88	30.9	135	0.09	0.57	28.4	29.0	0.53	6.78	7.31	—	37,335	37,335	2.02	2.42	3.36	38,111
2026	9.22	28.9	126	0.09	0.52	28.4	29.0	0.49	6.78	7.26	—	36,663	36,663	1.14	2.42	3.05	37,417
2027	8.83	27.2	118	0.09	0.47	28.4	28.9	0.45	6.78	7.22	—	35,993	35,993	1.09	2.31	2.74	36,712
2028	8.53	25.4	110	0.09	0.44	28.4	28.9	0.34	6.78	7.12	—	35,323	35,323	1.02	2.31	2.46	36,039
2029	7.31	24.5	104	0.09	0.34	28.4	28.8	0.32	6.78	7.10	—	34,659	34,659	0.97	2.24	2.18	35,353
2030	69.2	23.1	98.2	0.09	0.33	28.4	28.8	0.31	6.78	7.08	—	34,006	34,006	0.89	2.24	1.94	34,698
2031	69.1	1.80	16.1	< 0.005	0.01	5.17	5.18	0.01	1.21	1.22	—	4,706	4,706	0.06	0.19	0.27	4,764
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2023	2.29	22.1	19.9	0.03	0.97	2.18	3.15	0.89	0.99	1.88	—	3,383	3,383	0.14	0.03	0.31	3,397
2024	6.39	24.4	83.5	0.06	0.62	15.1	15.7	0.58	3.70	4.28	—	20,902	20,902	1.11	1.24	30.8	21,330
2025	6.97	22.7	101	0.07	0.41	20.1	20.5	0.38	4.78	5.16	—	26,924	26,924	1.45	1.73	40.1	27,516
2026	6.59	21.3	93.9	0.07	0.37	20.1	20.4	0.35	4.78	5.13	—	26,437	26,437	0.82	1.73	36.3	27,009
2027	6.34	20.0	87.7	0.07	0.34	20.1	20.4	0.32	4.78	5.10	—	25,953	25,953	0.78	1.65	32.6	26,497
2028	6.08	18.8	83.0	0.07	0.31	20.1	20.4	0.25	4.79	5.04	—	25,538	25,538	0.73	1.66	29.3	26,079
2029	5.22	17.6	77.8	0.07	0.25	20.1	20.3	0.23	4.78	5.01	—	24,990	24,990	0.69	1.60	26.0	25,511
2030	18.4	6.24	24.6	0.02	0.12	5.99	6.12	0.11	1.42	1.54	—	7,413	7,413	0.18	0.43	6.69	7,551
2031	3.79	0.10	0.92	< 0.005	< 0.005	0.28	0.28	< 0.005	0.07	0.07	—	261	261	< 0.005	0.01	0.25	265
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2023	0.42	4.04	3.62	0.01	0.18	0.40	0.57	0.16	0.18	0.34	—	560	560	0.02	0.01	0.05	562
2024	1.17	4.46	15.2	0.01	0.11	2.75	2.86	0.11	0.68	0.78	—	3,460	3,460	0.18	0.21	5.10	3,531

2025	1.27	4.15	18.4	0.01	0.07	3.66	3.74	0.07	0.87	0.94	—	4,458	4,458	0.24	0.29	6.63	4,556
2026	1.20	3.89	17.1	0.01	0.07	3.66	3.73	0.06	0.87	0.94	—	4,377	4,377	0.14	0.29	6.01	4,472
2027	1.16	3.65	16.0	0.01	0.06	3.66	3.73	0.06	0.87	0.93	—	4,297	4,297	0.13	0.27	5.40	4,387
2028	1.11	3.42	15.1	0.01	0.06	3.67	3.73	0.05	0.87	0.92	—	4,228	4,228	0.12	0.27	4.86	4,318
2029	0.95	3.21	14.2	0.01	0.04	3.66	3.71	0.04	0.87	0.91	—	4,137	4,137	0.11	0.27	4.30	4,224
2030	3.36	1.14	4.49	< 0.005	0.02	1.09	1.12	0.02	0.26	0.28	—	1,227	1,227	0.03	0.07	1.11	1,250
2031	0.69	0.02	0.17	< 0.005	< 0.005	0.05	0.05	< 0.005	0.01	0.01	—	43.3	43.3	< 0.005	< 0.005	0.04	43.8

2.3. Construction Emissions by Year, Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Year	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily - Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2023	4.03	39.8	36.4	0.06	1.81	7.79	9.59	1.66	3.97	5.63	—	6,759	6,759	0.28	0.06	0.68	6,784
2024	10.7	34.3	117	0.09	1.45	16.6	17.2	1.33	3.99	4.59	—	27,493	27,493	1.66	2.05	88.1	28,235
2025	9.72	26.2	109	0.09	0.57	16.6	17.1	0.53	3.99	4.53	—	27,010	27,010	1.61	2.05	82.3	27,744
2026	9.06	24.7	102	0.09	0.52	16.6	17.1	0.49	3.99	4.48	—	26,540	26,540	1.54	2.01	74.9	27,253
2027	8.63	23.2	96.2	0.09	0.47	16.6	17.0	0.45	3.99	4.44	—	26,068	26,068	1.05	1.94	67.2	26,740
2028	8.24	22.3	90.3	0.09	0.44	16.6	17.0	0.34	3.99	4.34	—	25,581	25,581	0.97	1.94	60.1	26,244
2029	7.82	21.1	85.3	0.09	0.34	16.6	16.9	0.32	3.99	4.32	—	25,088	25,088	0.92	1.87	53.3	25,723
2030	69.2	6.30	13.7	0.01	0.22	2.79	2.80	0.20	0.65	0.66	—	2,898	2,898	0.06	0.11	6.48	2,940
Daily - Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2023	3.81	37.4	32.3	0.06	1.59	3.73	5.33	1.47	1.46	2.92	—	6,746	6,746	0.28	0.06	0.02	6,770
2024	10.1	34.4	96.9	0.09	1.45	16.6	17.2	1.33	3.99	4.59	—	26,218	26,218	1.70	2.05	2.29	26,874
2025	9.14	27.2	90.3	0.09	0.57	16.6	17.1	0.53	3.99	4.53	—	25,765	25,765	1.65	2.05	2.13	26,420
2026	8.48	25.6	84.8	0.09	0.52	16.6	17.1	0.49	3.99	4.48	—	25,325	25,325	1.14	2.05	1.94	25,968

2027	8.09	24.2	79.9	0.09	0.47	16.6	17.0	0.45	3.99	4.44	—	24,880	24,880	1.09	1.94	1.74	25,488
2028	7.79	22.8	75.1	0.09	0.44	16.6	17.0	0.34	3.99	4.34	—	24,419	24,419	1.02	1.94	1.56	25,024
2029	6.94	21.9	71.2	0.09	0.34	16.6	16.9	0.32	3.99	4.32	—	23,950	23,950	0.97	1.87	1.38	24,534
2030	69.1	20.9	67.5	0.09	0.33	16.6	16.9	0.31	3.99	4.30	—	23,478	23,478	0.89	1.87	1.23	24,060
2031	69.0	1.43	10.4	< 0.005	0.01	2.79	2.80	0.01	0.65	0.66	—	2,634	2,634	0.06	0.11	0.15	2,669
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2023	2.28	22.1	19.5	0.03	0.97	2.11	3.08	0.89	0.97	1.86	—	3,314	3,314	0.14	0.03	0.17	3,326
2024	5.82	22.2	57.3	0.06	0.62	9.08	9.71	0.58	2.30	2.89	—	14,800	14,800	0.92	1.05	19.3	15,157
2025	6.44	19.8	66.9	0.07	0.41	11.7	12.1	0.38	2.82	3.20	—	18,541	18,541	1.18	1.47	25.4	19,033
2026	6.06	18.6	62.7	0.07	0.37	11.7	12.1	0.35	2.82	3.16	—	18,223	18,223	0.82	1.47	23.1	18,704
2027	5.82	17.6	58.9	0.07	0.34	11.7	12.0	0.32	2.82	3.14	—	17,902	17,902	0.78	1.39	20.7	18,356
2028	5.55	16.6	55.9	0.07	0.31	11.7	12.0	0.25	2.83	3.07	—	17,618	17,618	0.73	1.39	18.6	18,069
2029	4.96	15.7	52.7	0.07	0.25	11.7	11.9	0.23	2.82	3.05	—	17,232	17,232	0.69	1.34	16.5	17,665
2030	18.3	5.76	17.5	0.02	0.12	3.44	3.56	0.11	0.82	0.94	—	5,087	5,087	0.18	0.34	4.11	5,198
2031	3.78	0.08	0.59	< 0.005	< 0.005	0.15	0.15	< 0.005	0.04	0.04	—	146	146	< 0.005	0.01	0.14	148
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2023	0.42	4.03	3.57	0.01	0.18	0.39	0.56	0.16	0.18	0.34	—	549	549	0.02	< 0.005	0.03	551
2024	1.06	4.05	10.5	0.01	0.11	1.66	1.77	0.11	0.42	0.53	—	2,450	2,450	0.15	0.17	3.20	2,509
2025	1.17	3.61	12.2	0.01	0.07	2.13	2.21	0.07	0.51	0.58	—	3,070	3,070	0.20	0.24	4.21	3,151
2026	1.11	3.40	11.4	0.01	0.07	2.13	2.20	0.06	0.51	0.58	—	3,017	3,017	0.14	0.24	3.82	3,097
2027	1.06	3.22	10.7	0.01	0.06	2.13	2.20	0.06	0.51	0.57	—	2,964	2,964	0.13	0.23	3.43	3,039
2028	1.01	3.04	10.2	0.01	0.06	2.14	2.20	0.05	0.52	0.56	—	2,917	2,917	0.12	0.23	3.08	2,992
2029	0.91	2.87	9.61	0.01	0.04	2.13	2.18	0.04	0.51	0.56	—	2,853	2,853	0.11	0.22	2.72	2,925
2030	3.35	1.05	3.20	< 0.005	0.02	0.63	0.65	0.02	0.15	0.17	—	842	842	0.03	0.06	0.68	861
2031	0.69	0.01	0.11	< 0.005	< 0.005	0.03	0.03	< 0.005	0.01	0.01	—	24.2	24.2	< 0.005	< 0.005	0.02	24.5

2.4. Operations Emissions Compared Against Thresholds

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Un/Mit.	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	112	39.2	493	1.06	1.31	106	107	1.27	26.9	28.2	1,388	135,635	137,023	145	4.91	78.3	142,190
Mit.	107	39.1	493	1.06	1.31	106	107	1.27	26.9	28.1	1,388	135,431	136,819	145	4.90	78.2	141,984
% Reduced	4%	< 0.5%	< 0.5%	< 0.5%	—	< 0.5%	< 0.5%	—	< 0.5%	< 0.5%	—	< 0.5%	< 0.5%	< 0.5%	< 0.5%	< 0.5%	< 0.5%
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	97.1	39.7	275	0.99	1.24	106	107	1.22	26.9	28.1	1,388	128,723	130,112	145	5.03	22.8	135,262
Mit.	92.3	39.7	275	0.99	1.24	106	107	1.22	26.9	28.1	1,388	128,533	129,921	145	5.03	22.8	135,068
% Reduced	5%	< 0.5%	< 0.5%	< 0.5%	—	< 0.5%	< 0.5%	—	< 0.5%	< 0.5%	—	< 0.5%	< 0.5%	< 0.5%	< 0.5%	< 0.5%	< 0.5%
Average Daily (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	106	41.1	396	1.01	1.29	105	106	1.25	26.6	27.9	1,388	130,022	131,410	145	5.07	46.0	136,593
Mit.	102	41.0	396	1.01	1.29	105	106	1.25	26.5	27.8	1,388	129,829	131,217	145	5.06	45.9	136,397
% Reduced	5%	< 0.5%	< 0.5%	< 0.5%	—	< 0.5%	< 0.5%	—	< 0.5%	< 0.5%	—	< 0.5%	< 0.5%	< 0.5%	< 0.5%	< 0.5%	< 0.5%
Annual (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	19.4	7.50	72.3	0.18	0.24	19.1	19.4	0.23	4.86	5.08	230	21,527	21,756	24.0	0.84	7.61	22,615
Mit.	18.5	7.48	72.2	0.18	0.24	19.1	19.3	0.23	4.85	5.07	230	21,495	21,724	24.0	0.84	7.60	22,582
% Reduced	5%	< 0.5%	< 0.5%	< 0.5%	< 0.5%	< 0.5%	< 0.5%	< 0.5%	< 0.5%	< 0.5%	—	< 0.5%	< 0.5%	< 0.5%	< 0.5%	< 0.5%	< 0.5%

2.5. Operations Emissions by Sector, Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Sector	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	31.8	27.8	327	0.99	0.45	106	107	0.42	26.9	27.3	—	101,893	101,893	3.25	4.17	57.0	103,275
Area	79.9	1.49	162	0.01	0.07	—	0.07	0.05	—	0.05	—	432	432	0.02	< 0.005	—	434
Energy	0.58	9.86	4.19	0.06	0.80	—	0.80	0.80	—	0.80	—	31,763	31,763	2.30	0.17	—	31,871
Water	—	—	—	—	—	—	—	—	—	—	228	1,546	1,774	23.4	0.57	—	2,528
Waste	—	—	—	—	—	—	—	—	—	—	1,161	0.00	1,161	116	0.00	—	4,061
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	21.4	21.4
Total	112	39.2	493	1.06	1.31	106	107	1.27	26.9	28.2	1,388	135,635	137,023	145	4.91	78.3	142,190
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	30.6	29.9	271	0.93	0.45	106	107	0.42	26.9	27.3	—	95,414	95,414	3.35	4.30	1.48	96,781
Area	65.9	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Energy	0.58	9.86	4.19	0.06	0.80	—	0.80	0.80	—	0.80	—	31,763	31,763	2.30	0.17	—	31,871
Water	—	—	—	—	—	—	—	—	—	—	228	1,546	1,774	23.4	0.57	—	2,528
Waste	—	—	—	—	—	—	—	—	—	—	1,161	0.00	1,161	116	0.00	—	4,061
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	21.4	21.4
Total	97.1	39.7	275	0.99	1.24	106	107	1.22	26.9	28.1	1,388	128,723	130,112	145	5.03	22.8	135,262
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	30.3	30.2	281	0.94	0.45	105	105	0.42	26.6	27.0	—	96,416	96,416	3.35	4.33	24.6	97,815
Area	75.5	1.02	111	< 0.005	0.05	—	0.05	0.04	—	0.04	—	296	296	0.01	< 0.005	—	297
Energy	0.58	9.86	4.19	0.06	0.80	—	0.80	0.80	—	0.80	—	31,763	31,763	2.30	0.17	—	31,871
Water	—	—	—	—	—	—	—	—	—	—	228	1,546	1,774	23.4	0.57	—	2,528
Waste	—	—	—	—	—	—	—	—	—	—	1,161	0.00	1,161	116	0.00	—	4,061
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	21.4	21.4
Total	106	41.1	396	1.01	1.29	105	106	1.25	26.6	27.9	1,388	130,022	131,410	145	5.07	46.0	136,593

Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	5.52	5.51	51.3	0.17	0.08	19.1	19.2	0.08	4.86	4.93	—	15,963	15,963	0.55	0.72	4.07	16,194
Area	13.8	0.19	20.3	< 0.005	0.01	—	0.01	0.01	—	0.01	—	49.0	49.0	< 0.005	< 0.005	—	49.2
Energy	0.11	1.80	0.77	0.01	0.15	—	0.15	0.15	—	0.15	—	5,259	5,259	0.38	0.03	—	5,277
Water	—	—	—	—	—	—	—	—	—	—	37.7	256	294	3.88	0.09	—	419
Waste	—	—	—	—	—	—	—	—	—	—	192	0.00	192	19.2	0.00	—	672
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	3.54	3.54
Total	19.4	7.50	72.3	0.18	0.24	19.1	19.4	0.23	4.86	5.08	230	21,527	21,756	24.0	0.84	7.61	22,615

2.6. Operations Emissions by Sector, Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Sector	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	31.8	27.8	326	0.99	0.45	106	106	0.42	26.9	27.3	—	101,690	101,690	3.25	4.17	56.9	103,069
Area	75.1	1.49	162	0.01	0.07	—	0.07	0.05	—	0.05	—	432	432	0.02	< 0.005	—	434
Energy	0.58	9.86	4.19	0.06	0.80	—	0.80	0.80	—	0.80	—	31,763	31,763	2.30	0.17	—	31,871
Water	—	—	—	—	—	—	—	—	—	—	228	1,546	1,774	23.4	0.57	—	2,528
Waste	—	—	—	—	—	—	—	—	—	—	1,161	0.00	1,161	116	0.00	—	4,061
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	21.4	21.4
Total	107	39.1	493	1.06	1.31	106	107	1.27	26.9	28.1	1,388	135,431	136,819	145	4.90	78.2	141,984
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	30.6	29.8	271	0.93	0.45	106	106	0.42	26.9	27.3	—	95,224	95,224	3.35	4.29	1.47	96,587
Area	61.1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Energy	0.58	9.86	4.19	0.06	0.80	—	0.80	0.80	—	0.80	—	31,763	31,763	2.30	0.17	—	31,871
Water	—	—	—	—	—	—	—	—	—	—	228	1,546	1,774	23.4	0.57	—	2,528

Waste	—	—	—	—	—	—	—	—	—	—	1,161	0.00	1,161	116	0.00	—	4,061
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	21.4	21.4
Total	92.3	39.7	275	0.99	1.24	106	107	1.22	26.9	28.1	1,388	128,533	129,921	145	5.03	22.8	135,068
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	30.2	30.1	280	0.94	0.45	105	105	0.42	26.5	27.0	—	96,224	96,224	3.34	4.32	24.6	97,619
Area	70.7	1.02	111	< 0.005	0.05	—	0.05	0.04	—	0.04	—	296	296	0.01	< 0.005	—	297
Energy	0.58	9.86	4.19	0.06	0.80	—	0.80	0.80	—	0.80	—	31,763	31,763	2.30	0.17	—	31,871
Water	—	—	—	—	—	—	—	—	—	—	228	1,546	1,774	23.4	0.57	—	2,528
Waste	—	—	—	—	—	—	—	—	—	—	1,161	0.00	1,161	116	0.00	—	4,061
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	21.4	21.4
Total	102	41.0	396	1.01	1.29	105	106	1.25	26.5	27.8	1,388	129,829	131,217	145	5.06	45.9	136,397
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	5.51	5.50	51.2	0.17	0.08	19.1	19.2	0.08	4.85	4.92	—	15,931	15,931	0.55	0.72	4.07	16,162
Area	12.9	0.19	20.3	< 0.005	0.01	—	0.01	0.01	—	0.01	—	49.0	49.0	< 0.005	< 0.005	—	49.2
Energy	0.11	1.80	0.77	0.01	0.15	—	0.15	0.15	—	0.15	—	5,259	5,259	0.38	0.03	—	5,277
Water	—	—	—	—	—	—	—	—	—	—	37.7	256	294	3.88	0.09	—	419
Waste	—	—	—	—	—	—	—	—	—	—	192	0.00	192	19.2	0.00	—	672
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	3.54	3.54
Total	18.5	7.48	72.2	0.18	0.24	19.1	19.3	0.23	4.85	5.07	230	21,495	21,724	24.0	0.84	7.60	22,582

3. Construction Emissions Details

3.1. Demolition (2023) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	2.84	27.3	23.5	0.03	1.20	—	1.20	1.10	—	1.10	—	3,425	3,425	0.14	0.03	—	3,437
Demolition	—	—	—	—	—	0.00	0.00	—	0.00	0.00	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	2.84	27.3	23.5	0.03	1.20	—	1.20	1.10	—	1.10	—	3,425	3,425	0.14	0.03	—	3,437
Demolition	—	—	—	—	—	0.00	0.00	—	0.00	0.00	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.78	7.49	6.44	0.01	0.33	—	0.33	0.30	—	0.30	—	938	938	0.04	0.01	—	942
Demolition	—	—	—	—	—	0.00	0.00	—	0.00	0.00	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.14	1.37	1.17	< 0.005	0.06	—	0.06	0.06	—	0.06	—	155	155	0.01	< 0.005	—	156
Demolition	—	—	—	—	—	0.00	0.00	—	0.00	0.00	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.08	0.08	1.39	0.00	0.00	0.20	0.20	0.00	0.05	0.05	—	220	220	0.01	0.01	0.94	224
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.08	0.09	1.04	0.00	0.00	0.20	0.20	0.00	0.05	0.05	—	202	202	0.01	0.01	0.02	204
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.02	0.03	0.30	0.00	0.00	0.05	0.05	0.00	0.01	0.01	—	56.1	56.1	< 0.005	< 0.005	0.11	56.9
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.06	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	9.29	9.29	< 0.005	< 0.005	0.02	9.42
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.2. Demolition (2023) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	2.84	27.3	23.5	0.03	1.20	—	1.20	1.10	—	1.10	—	3,425	3,425	0.14	0.03	—	3,437

Demoliti	—	—	—	—	—	0.00	0.00	—	0.00	0.00	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	2.84	27.3	23.5	0.03	1.20	—	1.20	1.10	—	1.10	—	3,425	3,425	0.14	0.03	—	3,437
Demolition	—	—	—	—	—	0.00	0.00	—	0.00	0.00	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.78	7.49	6.44	0.01	0.33	—	0.33	0.30	—	0.30	—	938	938	0.04	0.01	—	942
Demolition	—	—	—	—	—	0.00	0.00	—	0.00	0.00	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.14	1.37	1.17	< 0.005	0.06	—	0.06	0.06	—	0.06	—	155	155	0.01	< 0.005	—	156
Demolition	—	—	—	—	—	0.00	0.00	—	0.00	0.00	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.07	0.05	0.82	0.00	0.00	0.11	0.11	0.00	0.02	0.02	—	120	120	0.01	< 0.005	0.51	122
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.07	0.06	0.64	0.00	0.00	0.11	0.11	0.00	0.02	0.02	—	110	110	0.01	< 0.005	0.01	112
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.02	0.02	0.18	0.00	0.00	0.03	0.03	0.00	0.01	0.01	—	30.7	30.7	< 0.005	< 0.005	0.06	31.2
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.03	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	5.08	5.08	< 0.005	< 0.005	0.01	5.16
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.3. Site Preparation (2023) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	3.95	39.7	35.5	0.05	1.81	—	1.81	1.66	—	1.66	—	5,295	5,295	0.21	0.04	—	5,314
Dust From Material Movement	—	—	—	—	—	7.67	7.67	—	3.94	3.94	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.65	6.53	5.83	0.01	0.30	—	0.30	0.27	—	0.27	—	870	870	0.04	0.01	—	873
Dust From Material Movement	—	—	—	—	—	1.26	1.26	—	0.65	0.65	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.12	1.19	1.06	< 0.005	0.05	—	0.05	0.05	—	0.05	—	144	144	0.01	< 0.005	—	145
Dust From Material Movement	—	—	—	—	—	0.23	0.23	—	0.12	0.12	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.10	0.09	1.62	0.00	0.00	0.23	0.23	0.00	0.05	0.05	—	257	257	0.01	0.01	1.10	261
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.02	0.21	0.00	0.00	0.04	0.04	0.00	0.01	0.01	—	39.3	39.3	< 0.005	< 0.005	0.08	39.8

Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.04	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	6.50	6.50	< 0.005	< 0.005	0.01	6.59
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.4. Site Preparation (2023) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	3.95	39.7	35.5	0.05	1.81	—	1.81	1.66	—	1.66	—	5,295	5,295	0.21	0.04	—	5,314
Dust From Material Movement	—	—	—	—	—	7.67	7.67	—	3.94	3.94	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.65	6.53	5.83	0.01	0.30	—	0.30	0.27	—	0.27	—	870	870	0.04	0.01	—	873
Dust From Material Movement	—	—	—	—	—	1.26	1.26	—	0.65	0.65	—	—	—	—	—	—	—

Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.12	1.19	1.06	< 0.005	0.05	—	0.05	0.05	—	0.05	—	144	144	0.01	< 0.005	—	145
Dust From Material Movement	—	—	—	—	—	0.23	0.23	—	0.12	0.12	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.09	0.06	0.95	0.00	0.00	0.12	0.12	0.00	0.03	0.03	—	140	140	0.01	0.01	0.60	143
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.13	0.00	0.00	0.02	0.02	0.00	< 0.005	< 0.005	—	21.5	21.5	< 0.005	< 0.005	0.04	21.8
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.02	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	3.56	3.56	< 0.005	< 0.005	0.01	3.61
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.5. Grading (2023) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	3.72	37.3	31.4	0.06	1.59	—	1.59	1.47	—	1.47	—	6,598	6,598	0.27	0.05	—	6,621
Dust From Material Movement	—	—	—	—	—	3.59	3.59	—	1.42	1.42	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	3.72	37.3	31.4	0.06	1.59	—	1.59	1.47	—	1.47	—	6,598	6,598	0.27	0.05	—	6,621
Dust From Material Movement	—	—	—	—	—	3.59	3.59	—	1.42	1.42	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.80	8.03	6.76	0.01	0.34	—	0.34	0.32	—	0.32	—	1,420	1,420	0.06	0.01	—	1,425
Dust From Material Movement	—	—	—	—	—	0.77	0.77	—	0.31	0.31	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Off-Road Equipment	0.15	1.47	1.23	< 0.005	0.06	—	0.06	0.06	—	0.06	—	235	235	0.01	< 0.005	—	236
Dust From Material Movement	—	—	—	—	—	0.14	0.14	—	0.06	0.06	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.11	0.11	1.85	0.00	0.00	0.26	0.26	0.00	0.06	0.06	—	294	294	0.01	0.01	1.26	298
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.10	0.12	1.39	0.00	0.00	0.26	0.26	0.00	0.06	0.06	—	269	269	0.01	0.01	0.03	273
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.02	0.03	0.32	0.00	0.00	0.06	0.06	0.00	0.01	0.01	—	58.8	58.8	< 0.005	< 0.005	0.12	59.6
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.06	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	9.73	9.73	< 0.005	< 0.005	0.02	9.87
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.6. Grading (2023) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	3.72	37.3	31.4	0.06	1.59	—	1.59	1.47	—	1.47	—	6,598	6,598	0.27	0.05	—	6,621
Dust From Material Movement	—	—	—	—	—	3.59	3.59	—	1.42	1.42	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	3.72	37.3	31.4	0.06	1.59	—	1.59	1.47	—	1.47	—	6,598	6,598	0.27	0.05	—	6,621
Dust From Material Movement	—	—	—	—	—	3.59	3.59	—	1.42	1.42	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.80	8.03	6.76	0.01	0.34	—	0.34	0.32	—	0.32	—	1,420	1,420	0.06	0.01	—	1,425
Dust From Material Movement	—	—	—	—	—	0.77	0.77	—	0.31	0.31	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Off-Road Equipment	0.15	1.47	1.23	< 0.005	0.06	—	0.06	0.06	—	0.06	—	235	235	0.01	< 0.005	—	236
Dust From Material Movement	—	—	—	—	—	0.14	0.14	—	0.06	0.06	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.10	0.06	1.09	0.00	0.00	0.14	0.14	0.00	0.03	0.03	—	161	161	0.01	0.01	0.68	163
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.09	0.07	0.86	0.00	0.00	0.14	0.14	0.00	0.03	0.03	—	147	147	0.01	0.01	0.02	149
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.02	0.02	0.19	0.00	0.00	0.03	0.03	0.00	0.01	0.01	—	32.1	32.1	< 0.005	< 0.005	0.06	32.7
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.04	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	5.32	5.32	< 0.005	< 0.005	0.01	5.41
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.7. Grading (2024) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	3.52	34.3	30.2	0.06	1.45	—	1.45	1.33	—	1.33	—	6,598	6,598	0.27	0.05	—	6,621
Dust From Material Movement	—	—	—	—	—	3.59	3.59	—	1.42	1.42	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	3.52	34.3	30.2	0.06	1.45	—	1.45	1.33	—	1.33	—	6,598	6,598	0.27	0.05	—	6,621
Dust From Material Movement	—	—	—	—	—	3.59	3.59	—	1.42	1.42	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.74	7.18	6.32	0.01	0.30	—	0.30	0.28	—	0.28	—	1,382	1,382	0.06	0.01	—	1,386
Dust From Material Movement	—	—	—	—	—	0.75	0.75	—	0.30	0.30	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Off-Road Equipment	0.13	1.31	1.15	< 0.005	0.06	—	0.06	0.05	—	0.05	—	229	229	0.01	< 0.005	—	230
Dust From Material Movement	—	—	—	—	—	0.14	0.14	—	0.05	0.05	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.10	0.10	1.69	0.00	0.00	0.26	0.26	0.00	0.06	0.06	—	288	288	0.01	0.01	1.15	292
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.10	0.11	1.28	0.00	0.00	0.26	0.26	0.00	0.06	0.06	—	264	264	0.01	0.01	0.03	267
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.02	0.02	0.28	0.00	0.00	0.05	0.05	0.00	0.01	0.01	—	56.0	56.0	< 0.005	< 0.005	0.10	56.8
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.05	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	9.28	9.28	< 0.005	< 0.005	0.02	9.41
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.8. Grading (2024) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	3.52	34.3	30.2	0.06	1.45	—	1.45	1.33	—	1.33	—	6,598	6,598	0.27	0.05	—	6,621
Dust From Material Movement	—	—	—	—	—	3.59	3.59	—	1.42	1.42	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	3.52	34.3	30.2	0.06	1.45	—	1.45	1.33	—	1.33	—	6,598	6,598	0.27	0.05	—	6,621
Dust From Material Movement	—	—	—	—	—	3.59	3.59	—	1.42	1.42	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.74	7.18	6.32	0.01	0.30	—	0.30	0.28	—	0.28	—	1,382	1,382	0.06	0.01	—	1,386
Dust From Material Movement	—	—	—	—	—	0.75	0.75	—	0.30	0.30	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Off-Road Equipment	0.13	1.31	1.15	< 0.005	0.06	—	0.06	0.05	—	0.05	—	229	229	0.01	< 0.005	—	230
Dust From Material Movement	—	—	—	—	—	0.14	0.14	—	0.05	0.05	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.09	0.06	0.99	0.00	0.00	0.14	0.14	0.00	0.03	0.03	—	157	157	0.01	0.01	0.62	160
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.09	0.07	0.79	0.00	0.00	0.14	0.14	0.00	0.03	0.03	—	144	144	0.01	0.01	0.02	146
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.02	0.01	0.17	0.00	0.00	0.03	0.03	0.00	0.01	0.01	—	30.6	30.6	< 0.005	< 0.005	0.06	31.1
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.03	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	5.07	5.07	< 0.005	< 0.005	0.01	5.15
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.9. Building Construction (2024) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.20	11.2	13.1	0.02	0.50	—	0.50	0.46	—	0.46	—	2,398	2,398	0.10	0.02	—	2,406
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.20	11.2	13.1	0.02	0.50	—	0.50	0.46	—	0.46	—	2,398	2,398	0.10	0.02	—	2,406
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.61	5.69	6.65	0.01	0.25	—	0.25	0.23	—	0.23	—	1,215	1,215	0.05	0.01	—	1,219
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.11	1.04	1.21	< 0.005	0.05	—	0.05	0.04	—	0.04	—	201	201	0.01	< 0.005	—	202
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	10.4	9.59	167	0.00	0.00	25.8	25.8	0.00	6.06	6.06	—	28,459	28,459	1.20	0.98	114	28,895
Vendor	0.27	11.0	5.87	0.07	0.14	2.61	2.74	0.14	0.72	0.86	—	9,549	9,549	0.74	1.42	26.6	10,018

Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	9.74	11.3	126	0.00	0.00	25.8	25.8	0.00	6.06	6.06	—	26,084	26,084	1.24	0.98	2.95	26,411
Vendor	0.25	11.4	5.96	0.07	0.14	2.61	2.74	0.14	0.72	0.86	—	9,553	9,553	0.74	1.42	0.69	9,996
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	4.89	5.72	67.3	0.00	0.00	12.9	12.9	0.00	3.03	3.03	—	13,408	13,408	0.63	0.50	24.9	13,597
Vendor	0.13	5.82	3.00	0.03	0.07	1.31	1.38	0.07	0.36	0.43	—	4,841	4,841	0.37	0.72	5.81	5,071
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.89	1.04	12.3	0.00	0.00	2.36	2.36	0.00	0.55	0.55	—	2,220	2,220	0.10	0.08	4.12	2,251
Vendor	0.02	1.06	0.55	0.01	0.01	0.24	0.25	0.01	0.07	0.08	—	801	801	0.06	0.12	0.96	840
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.10. Building Construction (2024) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.20	11.2	13.1	0.02	0.50	—	0.50	0.46	—	0.46	—	2,398	2,398	0.10	0.02	—	2,406
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Off-Road Equipment	1.20	11.2	13.1	0.02	0.50	—	0.50	0.46	—	0.46	—	2,398	2,398	0.10	0.02	—	2,406
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.61	5.69	6.65	0.01	0.25	—	0.25	0.23	—	0.23	—	1,215	1,215	0.05	0.01	—	1,219
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.11	1.04	1.21	< 0.005	0.05	—	0.05	0.04	—	0.04	—	201	201	0.01	< 0.005	—	202
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	9.24	5.88	98.3	0.00	0.00	14.0	14.0	0.00	3.27	3.27	—	15,547	15,547	0.83	0.61	61.5	15,811
Vendor	0.27	11.0	5.87	0.07	0.14	2.61	2.74	0.14	0.72	0.86	—	9,549	9,549	0.74	1.42	26.6	10,018
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	8.63	6.84	77.8	0.00	0.00	14.0	14.0	0.00	3.27	3.27	—	14,267	14,267	0.87	0.61	1.60	14,472
Vendor	0.25	11.4	5.96	0.07	0.14	2.61	2.74	0.14	0.72	0.86	—	9,553	9,553	0.74	1.42	0.69	9,996
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	4.33	3.47	41.2	0.00	0.00	6.99	6.99	0.00	1.64	1.64	—	7,332	7,332	0.44	0.31	13.5	7,449
Vendor	0.13	5.82	3.00	0.03	0.07	1.31	1.38	0.07	0.36	0.43	—	4,841	4,841	0.37	0.72	5.81	5,071
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.79	0.63	7.52	0.00	0.00	1.28	1.28	0.00	0.30	0.30	—	1,214	1,214	0.07	0.05	2.23	1,233
Vendor	0.02	1.06	0.55	0.01	0.01	0.24	0.25	0.01	0.07	0.08	—	801	801	0.06	0.12	0.96	840
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.11. Building Construction (2025) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.13	10.4	13.0	0.02	0.43	—	0.43	0.40	—	0.40	—	2,398	2,398	0.10	0.02	—	2,406
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.13	10.4	13.0	0.02	0.43	—	0.43	0.40	—	0.40	—	2,398	2,398	0.10	0.02	—	2,406
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.80	7.46	9.31	0.02	0.31	—	0.31	0.28	—	0.28	—	1,713	1,713	0.07	0.01	—	1,719
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.15	1.36	1.70	< 0.005	0.06	—	0.06	0.05	—	0.05	—	284	284	0.01	< 0.005	—	285

Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	9.06	8.69	154	0.00	0.00	25.8	25.8	0.00	6.06	6.06	—	27,854	27,854	1.15	0.98	103	28,278
Vendor	0.26	10.4	5.65	0.07	0.14	2.61	2.74	0.14	0.72	0.86	—	9,396	9,396	0.73	1.42	26.4	9,864
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	8.50	9.59	116	0.00	0.00	25.8	25.8	0.00	6.06	6.06	—	25,537	25,537	1.20	0.98	2.67	25,862
Vendor	0.25	10.9	5.66	0.07	0.14	2.61	2.74	0.14	0.72	0.86	—	9,401	9,401	0.73	1.42	0.69	9,844
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	5.98	7.42	87.5	0.00	0.00	18.2	18.2	0.00	4.27	4.27	—	18,499	18,499	0.86	0.70	31.9	18,761
Vendor	0.18	7.83	4.01	0.05	0.10	1.84	1.94	0.10	0.51	0.61	—	6,713	6,713	0.52	1.02	8.18	7,037
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	1.09	1.35	16.0	0.00	0.00	3.33	3.33	0.00	0.78	0.78	—	3,063	3,063	0.14	0.12	5.28	3,106
Vendor	0.03	1.43	0.73	0.01	0.02	0.34	0.35	0.02	0.09	0.11	—	1,111	1,111	0.09	0.17	1.36	1,165
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.12. Building Construction (2025) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.13	10.4	13.0	0.02	0.43	—	0.43	0.40	—	0.40	—	2,398	2,398	0.10	0.02	—	2,406
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.13	10.4	13.0	0.02	0.43	—	0.43	0.40	—	0.40	—	2,398	2,398	0.10	0.02	—	2,406
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.80	7.46	9.31	0.02	0.31	—	0.31	0.28	—	0.28	—	1,713	1,713	0.07	0.01	—	1,719
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.15	1.36	1.70	< 0.005	0.06	—	0.06	0.05	—	0.05	—	284	284	0.01	< 0.005	—	285
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	8.32	5.36	90.6	0.00	0.00	14.0	14.0	0.00	3.27	3.27	—	15,216	15,216	0.78	0.61	55.8	15,474
Vendor	0.26	10.4	5.65	0.07	0.14	2.61	2.74	0.14	0.72	0.86	—	9,396	9,396	0.73	1.42	26.4	9,864
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Worker	7.76	5.88	71.6	0.00	0.00	14.0	14.0	0.00	3.27	3.27	—	13,967	13,967	0.83	0.61	1.45	14,171
Vendor	0.25	10.9	5.66	0.07	0.14	2.61	2.74	0.14	0.72	0.86	—	9,401	9,401	0.73	1.42	0.69	9,844
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	5.45	4.51	53.6	0.00	0.00	9.86	9.86	0.00	2.31	2.31	—	10,116	10,116	0.59	0.44	17.2	10,278
Vendor	0.18	7.83	4.01	0.05	0.10	1.84	1.94	0.10	0.51	0.61	—	6,713	6,713	0.52	1.02	8.18	7,037
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.99	0.82	9.78	0.00	0.00	1.80	1.80	0.00	0.42	0.42	—	1,675	1,675	0.10	0.07	2.85	1,702
Vendor	0.03	1.43	0.73	0.01	0.02	0.34	0.35	0.02	0.09	0.11	—	1,111	1,111	0.09	0.17	1.36	1,165
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.13. Building Construction (2026) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.07	9.85	13.0	0.02	0.38	—	0.38	0.35	—	0.35	—	2,397	2,397	0.10	0.02	—	2,405
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.07	9.85	13.0	0.02	0.38	—	0.38	0.35	—	0.35	—	2,397	2,397	0.10	0.02	—	2,405
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.77	7.04	9.26	0.02	0.27	—	0.27	0.25	—	0.25	—	1,712	1,712	0.07	0.01	—	1,718
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.14	1.28	1.69	< 0.005	0.05	—	0.05	0.05	—	0.05	—	283	283	0.01	< 0.005	—	284
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	8.54	7.80	142	0.00	0.00	25.8	25.8	0.00	6.06	6.06	—	27,284	27,284	1.15	0.94	93.4	27,686
Vendor	0.19	9.99	5.41	0.07	0.14	2.61	2.74	0.14	0.72	0.86	—	9,238	9,238	0.65	1.42	24.4	9,703
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	7.98	8.69	107	0.00	0.00	25.8	25.8	0.00	6.06	6.06	—	25,022	25,022	0.39	0.98	2.42	25,327
Vendor	0.18	10.4	5.49	0.07	0.14	2.61	2.74	0.14	0.72	0.86	—	9,243	9,243	0.65	1.42	0.63	9,685
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	5.70	6.79	80.8	0.00	0.00	18.2	18.2	0.00	4.27	4.27	—	18,124	18,124	0.28	0.70	28.8	18,369
Vendor	0.13	7.47	3.90	0.05	0.10	1.84	1.94	0.10	0.51	0.61	—	6,600	6,600	0.47	1.02	7.49	6,922
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	1.04	1.24	14.7	0.00	0.00	3.33	3.33	0.00	0.78	0.78	—	3,001	3,001	0.05	0.12	4.77	3,041
Vendor	0.02	1.36	0.71	0.01	0.02	0.34	0.35	0.02	0.09	0.11	—	1,093	1,093	0.08	0.17	1.24	1,146

Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.14. Building Construction (2026) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.07	9.85	13.0	0.02	0.38	—	0.38	0.35	—	0.35	—	2,397	2,397	0.10	0.02	—	2,405
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.07	9.85	13.0	0.02	0.38	—	0.38	0.35	—	0.35	—	2,397	2,397	0.10	0.02	—	2,405
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.77	7.04	9.26	0.02	0.27	—	0.27	0.25	—	0.25	—	1,712	1,712	0.07	0.01	—	1,718
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.14	1.28	1.69	< 0.005	0.05	—	0.05	0.05	—	0.05	—	283	283	0.01	< 0.005	—	284
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	7.80	4.84	83.8	0.00	0.00	14.0	14.0	0.00	3.27	3.27	—	14,905	14,905	0.78	0.57	50.5	15,144
Vendor	0.19	9.99	5.41	0.07	0.14	2.61	2.74	0.14	0.72	0.86	—	9,238	9,238	0.65	1.42	24.4	9,703
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	7.23	5.36	66.4	0.00	0.00	14.0	14.0	0.00	3.27	3.27	—	13,685	13,685	0.39	0.61	1.31	13,878
Vendor	0.18	10.4	5.49	0.07	0.14	2.61	2.74	0.14	0.72	0.86	—	9,243	9,243	0.65	1.42	0.63	9,685
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	5.17	4.14	49.6	0.00	0.00	9.86	9.86	0.00	2.31	2.31	—	9,910	9,910	0.28	0.44	15.6	10,063
Vendor	0.13	7.47	3.90	0.05	0.10	1.84	1.94	0.10	0.51	0.61	—	6,600	6,600	0.47	1.02	7.49	6,922
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.94	0.76	9.04	0.00	0.00	1.80	1.80	0.00	0.42	0.42	—	1,641	1,641	0.05	0.07	2.58	1,666
Vendor	0.02	1.36	0.71	0.01	0.02	0.34	0.35	0.02	0.09	0.11	—	1,093	1,093	0.08	0.17	1.24	1,146
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.15. Building Construction (2027) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.03	9.39	12.9	0.02	0.34	—	0.34	0.31	—	0.31	—	2,397	2,397	0.10	0.02	—	2,405

Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.03	9.39	12.9	0.02	0.34	—	0.34	0.31	—	0.31	—	2,397	2,397	0.10	0.02	—	2,405
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.74	6.71	9.24	0.02	0.24	—	0.24	0.22	—	0.22	—	1,712	1,712	0.07	0.01	—	1,718
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.13	1.22	1.69	< 0.005	0.04	—	0.04	0.04	—	0.04	—	283	283	0.01	< 0.005	—	284
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	8.15	6.91	133	0.00	0.00	25.8	25.8	0.00	6.06	6.06	—	26,737	26,737	0.31	0.94	84.0	27,107
Vendor	0.19	9.54	5.19	0.07	0.14	2.61	2.74	0.14	0.72	0.86	—	9,065	9,065	0.65	1.35	21.7	9,507
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	7.63	7.80	99.8	0.00	0.00	25.8	25.8	0.00	6.06	6.06	—	24,525	24,525	0.35	0.94	2.18	24,815
Vendor	0.18	10.0	5.26	0.07	0.14	2.61	2.74	0.14	0.72	0.86	—	9,071	9,071	0.65	1.35	0.56	9,491
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	5.48	6.15	74.7	0.00	0.00	18.2	18.2	0.00	4.27	4.27	—	17,763	17,763	0.25	0.67	25.9	17,995
Vendor	0.13	7.15	3.73	0.05	0.10	1.84	1.94	0.10	0.51	0.61	—	6,477	6,477	0.46	0.97	6.69	6,784
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	1.00	1.12	13.6	0.00	0.00	3.33	3.33	0.00	0.78	0.78	—	2,941	2,941	0.04	0.11	4.29	2,979
Vendor	0.02	1.30	0.68	0.01	0.02	0.34	0.35	0.02	0.09	0.11	—	1,072	1,072	0.08	0.16	1.11	1,123
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.16. Building Construction (2027) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.03	9.39	12.9	0.02	0.34	—	0.34	0.31	—	0.31	—	2,397	2,397	0.10	0.02	—	2,405
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.03	9.39	12.9	0.02	0.34	—	0.34	0.31	—	0.31	—	2,397	2,397	0.10	0.02	—	2,405
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.74	6.71	9.24	0.02	0.24	—	0.24	0.22	—	0.22	—	1,712	1,712	0.07	0.01	—	1,718

Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.13	1.22	1.69	< 0.005	0.04	—	0.04	0.04	—	0.04	—	283	283	0.01	< 0.005	—	284
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	7.41	4.31	78.1	0.00	0.00	14.0	14.0	0.00	3.27	3.27	—	14,605	14,605	0.31	0.57	45.4	14,827
Vendor	0.19	9.54	5.19	0.07	0.14	2.61	2.74	0.14	0.72	0.86	—	9,065	9,065	0.65	1.35	21.7	9,507
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	6.89	4.84	61.7	0.00	0.00	14.0	14.0	0.00	3.27	3.27	—	13,412	13,412	0.35	0.57	1.18	13,591
Vendor	0.18	10.0	5.26	0.07	0.14	2.61	2.74	0.14	0.72	0.86	—	9,071	9,071	0.65	1.35	0.56	9,491
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	4.95	3.77	45.9	0.00	0.00	9.86	9.86	0.00	2.31	2.31	—	9,713	9,713	0.25	0.40	14.0	9,854
Vendor	0.13	7.15	3.73	0.05	0.10	1.84	1.94	0.10	0.51	0.61	—	6,477	6,477	0.46	0.97	6.69	6,784
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.90	0.69	8.37	0.00	0.00	1.80	1.80	0.00	0.42	0.42	—	1,608	1,608	0.04	0.07	2.32	1,631
Vendor	0.02	1.30	0.68	0.01	0.02	0.34	0.35	0.02	0.09	0.11	—	1,072	1,072	0.08	0.16	1.11	1,123
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.17. Building Construction (2028) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.99	8.92	12.9	0.02	0.30	—	0.30	0.28	—	0.28	—	2,397	2,397	0.10	0.02	—	2,406
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.99	8.92	12.9	0.02	0.30	—	0.30	0.28	—	0.28	—	2,397	2,397	0.10	0.02	—	2,406
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.71	6.39	9.26	0.02	0.22	—	0.22	0.20	—	0.20	—	1,717	1,717	0.07	0.01	—	1,723
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.13	1.17	1.69	< 0.005	0.04	—	0.04	0.04	—	0.04	—	284	284	0.01	< 0.005	—	285
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	7.80	6.82	123	0.00	0.00	25.8	25.8	0.00	6.06	6.06	—	26,227	26,227	0.31	0.94	75.4	26,589
Vendor	0.19	9.15	5.03	0.07	0.14	2.61	2.74	0.07	0.72	0.79	—	8,857	8,857	0.57	1.35	19.3	9,294

Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	7.37	6.91	92.3	0.00	0.00	25.8	25.8	0.00	6.06	6.06	—	24,062	24,062	0.35	0.94	1.96	24,352
Vendor	0.18	9.55	5.11	0.07	0.14	2.61	2.74	0.07	0.72	0.79	—	8,863	8,863	0.57	1.35	0.50	9,281
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	5.24	5.52	70.1	0.00	0.00	18.3	18.3	0.00	4.28	4.28	—	17,476	17,476	0.25	0.67	23.4	17,705
Vendor	0.13	6.84	3.63	0.05	0.10	1.85	1.95	0.05	0.51	0.56	—	6,345	6,345	0.41	0.97	5.96	6,651
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.96	1.01	12.8	0.00	0.00	3.34	3.34	0.00	0.78	0.78	—	2,893	2,893	0.04	0.11	3.87	2,931
Vendor	0.02	1.25	0.66	0.01	0.02	0.34	0.36	0.01	0.09	0.10	—	1,051	1,051	0.07	0.16	0.99	1,101
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.18. Building Construction (2028) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.99	8.92	12.9	0.02	0.30	—	0.30	0.28	—	0.28	—	2,397	2,397	0.10	0.02	—	2,406
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Off-Road Equipment	0.99	8.92	12.9	0.02	0.30	—	0.30	0.28	—	0.28	—	2,397	2,397	0.10	0.02	—	2,406
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.71	6.39	9.26	0.02	0.22	—	0.22	0.20	—	0.20	—	1,717	1,717	0.07	0.01	—	1,723
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.13	1.17	1.69	< 0.005	0.04	—	0.04	0.04	—	0.04	—	284	284	0.01	< 0.005	—	285
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	7.06	4.23	72.3	0.00	0.00	14.0	14.0	0.00	3.27	3.27	—	14,327	14,327	0.31	0.57	40.8	14,544
Vendor	0.19	9.15	5.03	0.07	0.14	2.61	2.74	0.07	0.72	0.79	—	8,857	8,857	0.57	1.35	19.3	9,294
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	6.62	4.31	57.1	0.00	0.00	14.0	14.0	0.00	3.27	3.27	—	13,159	13,159	0.35	0.57	1.06	13,337
Vendor	0.18	9.55	5.11	0.07	0.14	2.61	2.74	0.07	0.72	0.79	—	8,863	8,863	0.57	1.35	0.50	9,281
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	4.71	3.40	43.0	0.00	0.00	9.88	9.88	0.00	2.31	2.31	—	9,555	9,555	0.25	0.41	12.6	9,695
Vendor	0.13	6.84	3.63	0.05	0.10	1.85	1.95	0.05	0.51	0.56	—	6,345	6,345	0.41	0.97	5.96	6,651
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.86	0.62	7.86	0.00	0.00	1.80	1.80	0.00	0.42	0.42	—	1,582	1,582	0.04	0.07	2.09	1,605
Vendor	0.02	1.25	0.66	0.01	0.02	0.34	0.36	0.01	0.09	0.10	—	1,051	1,051	0.07	0.16	0.99	1,101
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.19. Building Construction (2029) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.97	8.58	12.9	0.02	0.28	—	0.28	0.25	—	0.25	—	2,397	2,397	0.10	0.02	—	2,405
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.97	8.58	12.9	0.02	0.28	—	0.28	0.25	—	0.25	—	2,397	2,397	0.10	0.02	—	2,405
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.69	6.13	9.22	0.02	0.20	—	0.20	0.18	—	0.18	—	1,712	1,712	0.07	0.01	—	1,718
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.13	1.12	1.68	< 0.005	0.04	—	0.04	0.03	—	0.03	—	283	283	0.01	< 0.005	—	284

Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	7.41	5.97	115	0.00	0.00	25.8	25.8	0.00	6.06	6.06	—	25,752	25,752	0.26	0.94	67.3	26,105
Vendor	0.19	8.75	4.81	0.07	0.07	2.61	2.67	0.07	0.72	0.79	—	8,625	8,625	0.57	1.29	16.9	9,039
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	6.17	6.86	86.4	0.00	0.00	25.8	25.8	0.00	6.06	6.06	—	23,631	23,631	0.31	0.94	1.74	23,920
Vendor	0.18	9.09	4.87	0.07	0.07	2.61	2.67	0.07	0.72	0.79	—	8,631	8,631	0.57	1.29	0.44	9,029
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	4.40	4.90	65.1	0.00	0.00	18.2	18.2	0.00	4.27	4.27	—	17,116	17,116	0.22	0.67	20.8	17,341
Vendor	0.13	6.53	3.46	0.05	0.05	1.84	1.89	0.05	0.51	0.56	—	6,162	6,162	0.40	0.92	5.23	6,452
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.80	0.89	11.9	0.00	0.00	3.33	3.33	0.00	0.78	0.78	—	2,834	2,834	0.04	0.11	3.44	2,871
Vendor	0.02	1.19	0.63	0.01	0.01	0.34	0.35	0.01	0.09	0.10	—	1,020	1,020	0.07	0.15	0.87	1,068
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.20. Building Construction (2029) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.97	8.58	12.9	0.02	0.28	—	0.28	0.25	—	0.25	—	2,397	2,397	0.10	0.02	—	2,405
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.97	8.58	12.9	0.02	0.28	—	0.28	0.25	—	0.25	—	2,397	2,397	0.10	0.02	—	2,405
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.69	6.13	9.22	0.02	0.20	—	0.20	0.18	—	0.18	—	1,712	1,712	0.07	0.01	—	1,718
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.13	1.12	1.68	< 0.005	0.04	—	0.04	0.03	—	0.03	—	283	283	0.01	< 0.005	—	284
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	6.67	3.75	67.6	0.00	0.00	14.0	14.0	0.00	3.27	3.27	—	14,067	14,067	0.26	0.57	36.4	14,278
Vendor	0.19	8.75	4.81	0.07	0.07	2.61	2.67	0.07	0.72	0.79	—	8,625	8,625	0.57	1.29	16.9	9,039
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Worker	5.80	4.27	53.4	0.00	0.00	14.0	14.0	0.00	3.27	3.27	—	12,923	12,923	0.31	0.57	0.94	13,100
Vendor	0.18	9.09	4.87	0.07	0.07	2.61	2.67	0.07	0.72	0.79	—	8,631	8,631	0.57	1.29	0.44	9,029
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	4.14	3.05	40.0	0.00	0.00	9.86	9.86	0.00	2.31	2.31	—	9,358	9,358	0.22	0.40	11.2	9,495
Vendor	0.13	6.53	3.46	0.05	0.05	1.84	1.89	0.05	0.51	0.56	—	6,162	6,162	0.40	0.92	5.23	6,452
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.76	0.56	7.30	0.00	0.00	1.80	1.80	0.00	0.42	0.42	—	1,549	1,549	0.04	0.07	1.86	1,572
Vendor	0.02	1.19	0.63	0.01	0.01	0.34	0.35	0.01	0.09	0.10	—	1,020	1,020	0.07	0.15	0.87	1,068
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.21. Building Construction (2030) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.94	8.39	12.9	0.02	0.26	—	0.26	0.24	—	0.24	—	2,397	2,397	0.10	0.02	—	2,405
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.16	1.40	2.14	< 0.005	0.04	—	0.04	0.04	—	0.04	—	399	399	0.02	< 0.005	—	400

Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.03	0.25	0.39	< 0.005	0.01	—	0.01	0.01	—	0.01	—	66.0	66.0	< 0.005	< 0.005	—	66.2
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	5.91	5.97	80.6	0.00	0.00	25.8	25.8	0.00	6.06	6.06	—	23,230	23,230	0.31	0.94	1.56	23,519
Vendor	0.17	8.76	4.72	0.07	0.07	2.61	2.67	0.07	0.72	0.79	—	8,379	8,379	0.49	1.29	0.38	8,775
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.98	0.99	14.1	0.00	0.00	4.25	4.25	0.00	0.99	0.99	—	3,918	3,918	0.05	0.16	4.30	3,970
Vendor	0.03	1.46	0.78	0.01	0.01	0.43	0.44	0.01	0.12	0.13	—	1,393	1,393	0.08	0.21	1.06	1,460
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.18	0.18	2.57	0.00	0.00	0.77	0.77	0.00	0.18	0.18	—	649	649	0.01	0.03	0.71	657
Vendor	0.01	0.27	0.14	< 0.005	< 0.005	0.08	0.08	< 0.005	0.02	0.02	—	231	231	0.01	0.04	0.18	242
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.22. Building Construction (2030) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.94	8.39	12.9	0.02	0.26	—	0.26	0.24	—	0.24	—	2,397	2,397	0.10	0.02	—	2,405
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.16	1.40	2.14	< 0.005	0.04	—	0.04	0.04	—	0.04	—	399	399	0.02	< 0.005	—	400
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.03	0.25	0.39	< 0.005	0.01	—	0.01	0.01	—	0.01	—	66.0	66.0	< 0.005	< 0.005	—	66.2
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	5.53	3.75	49.9	0.00	0.00	14.0	14.0	0.00	3.27	3.27	—	12,703	12,703	0.31	0.57	0.84	12,880
Vendor	0.17	8.76	4.72	0.07	0.07	2.61	2.67	0.07	0.72	0.79	—	8,379	8,379	0.49	1.29	0.38	8,775
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.91	0.62	8.65	0.00	0.00	2.30	2.30	0.00	0.54	0.54	—	2,142	2,142	0.05	0.09	2.32	2,174

Vendor	0.03	1.46	0.78	0.01	0.01	0.43	0.44	0.01	0.12	0.13	—	1,393	1,393	0.08	0.21	1.06	1,460
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.17	0.11	1.58	0.00	0.00	0.42	0.42	0.00	0.10	0.10	—	355	355	0.01	0.02	0.38	360
Vendor	0.01	0.27	0.14	< 0.005	< 0.005	0.08	0.08	< 0.005	0.02	0.02	—	231	231	0.01	0.04	0.18	242
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.23. Paving (2030) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.64	6.28	9.90	0.01	0.22	—	0.22	0.20	—	0.20	—	1,511	1,511	0.06	0.01	—	1,516
Paving	0.00	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.64	6.28	9.90	0.01	0.22	—	0.22	0.20	—	0.20	—	1,511	1,511	0.06	0.01	—	1,516
Paving	0.00	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.19	1.89	2.98	< 0.005	0.07	—	0.07	0.06	—	0.06	—	455	455	0.02	< 0.005	—	457
Paving	0.00	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.04	0.35	0.54	< 0.005	0.01	—	0.01	0.01	—	0.01	—	75.4	75.4	< 0.005	< 0.005	—	75.6
Paving	0.00	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.05	0.04	0.81	0.00	0.00	0.20	0.20	0.00	0.05	0.05	—	192	192	< 0.005	0.01	0.45	195
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.04	0.05	0.61	0.00	0.00	0.20	0.20	0.00	0.05	0.05	—	176	176	< 0.005	0.01	0.01	178
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.19	0.00	0.00	0.06	0.06	0.00	0.01	0.01	—	53.9	53.9	< 0.005	< 0.005	0.06	54.6
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.04	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	8.92	8.92	< 0.005	< 0.005	0.01	9.04
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.24. Paving (2030) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.64	6.28	9.90	0.01	0.22	—	0.22	0.20	—	0.20	—	1,511	1,511	0.06	0.01	—	1,516
Paving	0.00	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.64	6.28	9.90	0.01	0.22	—	0.22	0.20	—	0.20	—	1,511	1,511	0.06	0.01	—	1,516
Paving	0.00	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.19	1.89	2.98	< 0.005	0.07	—	0.07	0.06	—	0.06	—	455	455	0.02	< 0.005	—	457
Paving	0.00	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.04	0.35	0.54	< 0.005	0.01	—	0.01	0.01	—	0.01	—	75.4	75.4	< 0.005	< 0.005	—	75.6
Paving	0.00	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.04	0.02	0.48	0.00	0.00	0.11	0.11	0.00	0.02	0.02	—	105	105	< 0.005	< 0.005	0.25	106
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.04	0.03	0.38	0.00	0.00	0.11	0.11	0.00	0.02	0.02	—	96.4	96.4	< 0.005	< 0.005	0.01	97.7
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.12	0.00	0.00	0.03	0.03	0.00	0.01	0.01	—	29.4	29.4	< 0.005	< 0.005	0.03	29.9
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.02	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	4.88	4.88	< 0.005	< 0.005	0.01	4.95
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.25. Architectural Coating (2030) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Off-Road Equipment	0.10	0.78	1.11	< 0.005	0.01	—	0.01	0.01	—	0.01	—	134	134	0.01	< 0.005	—	134
Architectural Coatings	67.9	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.10	0.78	1.11	< 0.005	0.01	—	0.01	0.01	—	0.01	—	134	134	0.01	< 0.005	—	134
Architectural Coatings	67.9	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.02	0.19	0.27	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	32.9	32.9	< 0.005	< 0.005	—	33.0
Architectural Coatings	16.7	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	0.04	0.05	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	5.45	5.45	< 0.005	< 0.005	—	5.47
Architectural Coatings	3.06	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	1.25	1.02	21.3	0.00	0.00	5.17	5.17	0.00	1.21	1.21	—	5,062	5,062	0.05	0.19	12.0	5,131
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	1.18	1.19	16.1	0.00	0.00	5.17	5.17	0.00	1.21	1.21	—	4,646	4,646	0.06	0.19	0.31	4,704
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.29	0.29	4.17	0.00	0.00	1.26	1.26	0.00	0.29	0.29	—	1,162	1,162	0.02	0.05	1.27	1,177
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.05	0.05	0.76	0.00	0.00	0.23	0.23	0.00	0.05	0.05	—	192	192	< 0.005	0.01	0.21	195
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.26. Architectural Coating (2030) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.10	0.78	1.11	< 0.005	0.01	—	0.01	0.01	—	0.01	—	134	134	0.01	< 0.005	—	134

Architect Coatings	67.9	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.10	0.78	1.11	< 0.005	0.01	—	0.01	0.01	—	0.01	—	134	134	0.01	< 0.005	—	134
Architectural Coatings	67.9	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.02	0.19	0.27	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	32.9	32.9	< 0.005	< 0.005	—	33.0
Architectural Coatings	16.7	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	0.04	0.05	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	5.45	5.45	< 0.005	< 0.005	—	5.47
Architectural Coatings	3.06	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Worker	1.18	0.65	12.6	0.00	0.00	2.79	2.79	0.00	0.65	0.65	—	2,765	2,765	0.05	0.11	6.48	2,806
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	1.11	0.75	9.97	0.00	0.00	2.79	2.79	0.00	0.65	0.65	—	2,541	2,541	0.06	0.11	0.17	2,576
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.27	0.18	2.56	0.00	0.00	0.68	0.68	0.00	0.16	0.16	—	635	635	0.02	0.03	0.69	644
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.05	0.03	0.47	0.00	0.00	0.12	0.12	0.00	0.03	0.03	—	105	105	< 0.005	< 0.005	0.11	107
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.27. Architectural Coating (2031) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.10	0.78	1.10	< 0.005	0.01	—	0.01	0.01	—	0.01	—	134	134	0.01	< 0.005	—	134

Architect Coatings	67.9	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01	0.04	0.06	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	7.32	7.32	< 0.005	< 0.005	—	7.34
Architectural Coatings	3.72	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	0.01	0.01	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	1.21	1.21	< 0.005	< 0.005	—	1.22
Architectural Coatings	0.68	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	1.10	1.02	15.0	0.00	0.00	5.17	5.17	0.00	1.21	1.21	—	4,572	4,572	0.05	0.19	0.27	4,630
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.06	0.06	0.86	0.00	0.00	0.28	0.28	0.00	0.07	0.07	—	254	254	< 0.005	0.01	0.25	257

Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.16	0.00	0.00	0.05	0.05	0.00	0.01	0.01	—	42.1	42.1	< 0.005	< 0.005	0.04	42.6
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.28. Architectural Coating (2031) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.10	0.78	1.10	< 0.005	0.01	—	0.01	0.01	—	0.01	—	134	134	0.01	< 0.005	—	134
Architectural Coatings	67.9	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01	0.04	0.06	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	7.32	7.32	< 0.005	< 0.005	—	7.34
Architectural Coatings	3.72	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	0.01	0.01	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	1.21	1.21	< 0.005	< 0.005	—	1.22
Architectural Coatings	0.68	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	1.03	0.65	9.27	0.00	0.00	2.79	2.79	0.00	0.65	0.65	—	2,500	2,500	0.05	0.11	0.15	2,535
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.06	0.04	0.53	0.00	0.00	0.15	0.15	0.00	0.04	0.04	—	139	139	< 0.005	0.01	0.14	141
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.10	0.00	0.00	0.03	0.03	0.00	0.01	0.01	—	23.0	23.0	< 0.005	< 0.005	0.02	23.3
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

4. Operations Emissions Details

4.1. Mobile Emissions by Land Use

4.1.1. Unmitigated

Mobile source emissions results are presented in Sections 2.6. No further detailed breakdown of emissions is available.

4.1.2. Mitigated

Mobile source emissions results are presented in Sections 2.5. No further detailed breakdown of emissions is available.

4.2. Energy

4.2.1. Electricity Emissions By Land Use - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	2,296	2,296	0.14	0.02	—	2,305
Apartments High Rise	—	—	—	—	—	—	—	—	—	—	—	13,884	13,884	0.86	0.10	—	13,936
Condo/Townhouse	—	—	—	—	—	—	—	—	—	—	—	3,074	3,074	0.19	0.02	—	3,086
Total	—	—	—	—	—	—	—	—	—	—	—	19,254	19,254	1.19	0.14	—	19,327
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	2,296	2,296	0.14	0.02	—	2,305
Apartments High Rise	—	—	—	—	—	—	—	—	—	—	—	13,884	13,884	0.86	0.10	—	13,936

Condo/Townhouse	—	—	—	—	—	—	—	—	—	—	—	3,074	3,074	0.19	0.02	—	3,086
Total	—	—	—	—	—	—	—	—	—	—	—	19,254	19,254	1.19	0.14	—	19,327
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	380	380	0.02	< 0.005	—	382
Apartments High Rise	—	—	—	—	—	—	—	—	—	—	—	2,299	2,299	0.14	0.02	—	2,307
Condo/Townhouse	—	—	—	—	—	—	—	—	—	—	—	509	509	0.03	< 0.005	—	511
Total	—	—	—	—	—	—	—	—	—	—	—	3,188	3,188	0.20	0.02	—	3,200

4.2.2. Electricity Emissions By Land Use - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	2,296	2,296	0.14	0.02	—	2,305
Apartments High Rise	—	—	—	—	—	—	—	—	—	—	—	13,884	13,884	0.86	0.10	—	13,936
Condo/Townhouse	—	—	—	—	—	—	—	—	—	—	—	3,074	3,074	0.19	0.02	—	3,086
Total	—	—	—	—	—	—	—	—	—	—	—	19,254	19,254	1.19	0.14	—	19,327

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	2,296	2,296	0.14	0.02	—	2,305
Apartments High Rise	—	—	—	—	—	—	—	—	—	—	—	13,884	13,884	0.86	0.10	—	13,936
Condo/Townhouse	—	—	—	—	—	—	—	—	—	—	—	3,074	3,074	0.19	0.02	—	3,086
Total	—	—	—	—	—	—	—	—	—	—	—	19,254	19,254	1.19	0.14	—	19,327
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	380	380	0.02	< 0.005	—	382
Apartments High Rise	—	—	—	—	—	—	—	—	—	—	—	2,299	2,299	0.14	0.02	—	2,307
Condo/Townhouse	—	—	—	—	—	—	—	—	—	—	—	509	509	0.03	< 0.005	—	511
Total	—	—	—	—	—	—	—	—	—	—	—	3,188	3,188	0.20	0.02	—	3,200

4.2.3. Natural Gas Emissions By Land Use - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	0.10	1.64	0.70	0.01	0.13	—	0.13	0.13	—	0.13	—	2,076	2,076	0.18	< 0.005	—	2,082

Apartme High Rise	0.36	6.15	2.62	0.04	0.50	—	0.50	0.50	—	0.50	—	7,807	7,807	0.69	0.01	—	7,828
Condo/T ownhous e	0.12	2.07	0.88	0.01	0.17	—	0.17	0.17	—	0.17	—	2,627	2,627	0.23	< 0.005	—	2,634
Total	0.58	9.86	4.19	0.06	0.80	—	0.80	0.80	—	0.80	—	12,509	12,509	1.11	0.02	—	12,544
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	0.10	1.64	0.70	0.01	0.13	—	0.13	0.13	—	0.13	—	2,076	2,076	0.18	< 0.005	—	2,082
Apartme nts High Rise	0.36	6.15	2.62	0.04	0.50	—	0.50	0.50	—	0.50	—	7,807	7,807	0.69	0.01	—	7,828
Condo/T ownhous e	0.12	2.07	0.88	0.01	0.17	—	0.17	0.17	—	0.17	—	2,627	2,627	0.23	< 0.005	—	2,634
Total	0.58	9.86	4.19	0.06	0.80	—	0.80	0.80	—	0.80	—	12,509	12,509	1.11	0.02	—	12,544
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	0.02	0.30	0.13	< 0.005	0.02	—	0.02	0.02	—	0.02	—	344	344	0.03	< 0.005	—	345
Apartme nts High Rise	0.07	1.12	0.48	0.01	0.09	—	0.09	0.09	—	0.09	—	1,292	1,292	0.11	< 0.005	—	1,296
Condo/T ownhous e	0.02	0.38	0.16	< 0.005	0.03	—	0.03	0.03	—	0.03	—	435	435	0.04	< 0.005	—	436
Total	0.11	1.80	0.77	0.01	0.15	—	0.15	0.15	—	0.15	—	2,071	2,071	0.18	< 0.005	—	2,077

4.2.4. Natural Gas Emissions By Land Use - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	0.10	1.64	0.70	0.01	0.13	—	0.13	0.13	—	0.13	—	2,076	2,076	0.18	< 0.005	—	2,082
Apartments High Rise	0.36	6.15	2.62	0.04	0.50	—	0.50	0.50	—	0.50	—	7,807	7,807	0.69	0.01	—	7,828
Condo/Townhouse	0.12	2.07	0.88	0.01	0.17	—	0.17	0.17	—	0.17	—	2,627	2,627	0.23	< 0.005	—	2,634
Total	0.58	9.86	4.19	0.06	0.80	—	0.80	0.80	—	0.80	—	12,509	12,509	1.11	0.02	—	12,544
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	0.10	1.64	0.70	0.01	0.13	—	0.13	0.13	—	0.13	—	2,076	2,076	0.18	< 0.005	—	2,082
Apartments High Rise	0.36	6.15	2.62	0.04	0.50	—	0.50	0.50	—	0.50	—	7,807	7,807	0.69	0.01	—	7,828
Condo/Townhouse	0.12	2.07	0.88	0.01	0.17	—	0.17	0.17	—	0.17	—	2,627	2,627	0.23	< 0.005	—	2,634
Total	0.58	9.86	4.19	0.06	0.80	—	0.80	0.80	—	0.80	—	12,509	12,509	1.11	0.02	—	12,544
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	0.02	0.30	0.13	< 0.005	0.02	—	0.02	0.02	—	0.02	—	344	344	0.03	< 0.005	—	345
Apartments High Rise	0.07	1.12	0.48	0.01	0.09	—	0.09	0.09	—	0.09	—	1,292	1,292	0.11	< 0.005	—	1,296

Condo/Townhous	0.02	0.38	0.16	< 0.005	0.03	—	0.03	0.03	—	0.03	—	435	435	0.04	< 0.005	—	436
Total	0.11	1.80	0.77	0.01	0.15	—	0.15	0.15	—	0.15	—	2,071	2,071	0.18	< 0.005	—	2,077

4.3. Area Emissions by Source

4.3.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Source	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Consumer Products	63.8	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	2.05	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Landscape Equipment	14.0	1.49	162	0.01	0.07	—	0.07	0.05	—	0.05	—	432	432	0.02	< 0.005	—	434
Total	79.9	1.49	162	0.01	0.07	—	0.07	0.05	—	0.05	—	432	432	0.02	< 0.005	—	434
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Consumer Products	63.8	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	2.05	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	65.9	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Consum Products	11.7	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	0.37	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Landscape Equipment	1.75	0.19	20.3	< 0.005	0.01	—	0.01	0.01	—	0.01	—	49.0	49.0	< 0.005	< 0.005	—	49.2
Total	13.8	0.19	20.3	< 0.005	0.01	—	0.01	0.01	—	0.01	—	49.0	49.0	< 0.005	< 0.005	—	49.2

4.3.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Source	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Consumer Products	59.1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	2.05	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Landscape Equipment	14.0	1.49	162	0.01	0.07	—	0.07	0.05	—	0.05	—	432	432	0.02	< 0.005	—	434
Total	75.1	1.49	162	0.01	0.07	—	0.07	0.05	—	0.05	—	432	432	0.02	< 0.005	—	434
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Consumer Products	59.1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Architectural Coatings	2.05	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	61.1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Consumer Products	10.8	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	0.37	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Landscape Equipment	1.75	0.19	20.3	< 0.005	0.01	—	0.01	0.01	—	0.01	—	49.0	49.0	< 0.005	< 0.005	—	49.2
Total	12.9	0.19	20.3	< 0.005	0.01	—	0.01	0.01	—	0.01	—	49.0	49.0	< 0.005	< 0.005	—	49.2

4.4. Water Emissions by Land Use

4.4.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	16.5	454	470	1.72	0.04	—	526
Apartments High Rise	—	—	—	—	—	—	—	—	—	—	176	913	1,089	18.1	0.44	—	1,672
Condo/Townhouse	—	—	—	—	—	—	—	—	—	—	34.7	180	215	3.57	0.09	—	330

Total	—	—	—	—	—	—	—	—	—	—	228	1,546	1,774	23.4	0.57	—	2,528
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	16.5	454	470	1.72	0.04	—	526
Apartments High Rise	—	—	—	—	—	—	—	—	—	—	176	913	1,089	18.1	0.44	—	1,672
Condo/Townhouse	—	—	—	—	—	—	—	—	—	—	34.7	180	215	3.57	0.09	—	330
Total	—	—	—	—	—	—	—	—	—	—	228	1,546	1,774	23.4	0.57	—	2,528
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	2.74	75.1	77.8	0.29	0.01	—	87.1
Apartments High Rise	—	—	—	—	—	—	—	—	—	—	29.2	151	180	3.00	0.07	—	277
Condo/Townhouse	—	—	—	—	—	—	—	—	—	—	5.75	29.8	35.5	0.59	0.01	—	54.6
Total	—	—	—	—	—	—	—	—	—	—	37.7	256	294	3.88	0.09	—	419

4.4.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Single Family Housing	—	—	—	—	—	—	—	—	—	—	16.5	454	470	1.72	0.04	—	526
Apartments High Rise	—	—	—	—	—	—	—	—	—	—	176	913	1,089	18.1	0.44	—	1,672
Condo/Townhouse	—	—	—	—	—	—	—	—	—	—	34.7	180	215	3.57	0.09	—	330
Total	—	—	—	—	—	—	—	—	—	—	228	1,546	1,774	23.4	0.57	—	2,528
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	16.5	454	470	1.72	0.04	—	526
Apartments High Rise	—	—	—	—	—	—	—	—	—	—	176	913	1,089	18.1	0.44	—	1,672
Condo/Townhouse	—	—	—	—	—	—	—	—	—	—	34.7	180	215	3.57	0.09	—	330
Total	—	—	—	—	—	—	—	—	—	—	228	1,546	1,774	23.4	0.57	—	2,528
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	2.74	75.1	77.8	0.29	0.01	—	87.1
Apartments High Rise	—	—	—	—	—	—	—	—	—	—	29.2	151	180	3.00	0.07	—	277
Condo/Townhouse	—	—	—	—	—	—	—	—	—	—	5.75	29.8	35.5	0.59	0.01	—	54.6
Total	—	—	—	—	—	—	—	—	—	—	37.7	256	294	3.88	0.09	—	419

4.5. Waste Emissions by Land Use

4.5.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	108	0.00	108	10.8	0.00	—	377
Apartments High Rise	—	—	—	—	—	—	—	—	—	—	880	0.00	880	87.9	0.00	—	3,077
Condo/Townhouse	—	—	—	—	—	—	—	—	—	—	173	0.00	173	17.3	0.00	—	607
Total	—	—	—	—	—	—	—	—	—	—	1,161	0.00	1,161	116	0.00	—	4,061
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	108	0.00	108	10.8	0.00	—	377
Apartments High Rise	—	—	—	—	—	—	—	—	—	—	880	0.00	880	87.9	0.00	—	3,077
Condo/Townhouse	—	—	—	—	—	—	—	—	—	—	173	0.00	173	17.3	0.00	—	607
Total	—	—	—	—	—	—	—	—	—	—	1,161	0.00	1,161	116	0.00	—	4,061
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Single Family Housing	—	—	—	—	—	—	—	—	—	—	17.8	0.00	17.8	1.78	0.00	—	62.4
Apartments High Rise	—	—	—	—	—	—	—	—	—	—	146	0.00	146	14.6	0.00	—	509
Condo/Townhouse	—	—	—	—	—	—	—	—	—	—	28.7	0.00	28.7	2.87	0.00	—	100
Total	—	—	—	—	—	—	—	—	—	—	192	0.00	192	19.2	0.00	—	672

4.5.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	108	0.00	108	10.8	0.00	—	377
Apartments High Rise	—	—	—	—	—	—	—	—	—	—	880	0.00	880	87.9	0.00	—	3,077
Condo/Townhouse	—	—	—	—	—	—	—	—	—	—	173	0.00	173	17.3	0.00	—	607
Total	—	—	—	—	—	—	—	—	—	—	1,161	0.00	1,161	116	0.00	—	4,061
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	108	0.00	108	10.8	0.00	—	377

Apartments High Rise	—	—	—	—	—	—	—	—	—	—	880	0.00	880	87.9	0.00	—	3,077
Condo/Townhouse	—	—	—	—	—	—	—	—	—	—	173	0.00	173	17.3	0.00	—	607
Total	—	—	—	—	—	—	—	—	—	—	1,161	0.00	1,161	116	0.00	—	4,061
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	17.8	0.00	17.8	1.78	0.00	—	62.4
Apartments High Rise	—	—	—	—	—	—	—	—	—	—	146	0.00	146	14.6	0.00	—	509
Condo/Townhouse	—	—	—	—	—	—	—	—	—	—	28.7	0.00	28.7	2.87	0.00	—	100
Total	—	—	—	—	—	—	—	—	—	—	192	0.00	192	19.2	0.00	—	672

4.6. Refrigerant Emissions by Land Use

4.6.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2.89	2.89
Apartments High Rise	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	15.2	15.2

Condo/Townhous	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	3.30	3.30
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	21.4	21.4
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2.89	2.89
Apartments High Rise	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	15.2	15.2
Condo/Townhouse	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	3.30	3.30
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	21.4	21.4
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.48	0.48
Apartments High Rise	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2.51	2.51
Condo/Townhouse	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.55	0.55
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	3.54	3.54

4.6.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2.89	2.89
Apartments High Rise	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	15.2	15.2
Condo/Townhouse	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	3.30	3.30
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	21.4	21.4
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2.89	2.89
Apartments High Rise	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	15.2	15.2
Condo/Townhouse	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	3.30	3.30
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	21.4	21.4
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.48	0.48
Apartments High Rise	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2.51	2.51
Condo/Townhouse	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.55	0.55
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	3.54	3.54

4.7. Offroad Emissions By Equipment Type

4.7.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.7.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.8. Stationary Emissions By Equipment Type

4.8.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.8.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.9. User Defined Emissions By Equipment Type

4.9.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.9.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10. Soil Carbon Accumulation By Vegetation Type

4.10.1. Soil Carbon Accumulation By Vegetation Type - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Vegetation	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.2. Above and Belowground Carbon Accumulation by Land Use Type - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.3. Avoided and Sequestered Emissions by Species - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Species	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.4. Soil Carbon Accumulation By Vegetation Type - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Vegetation	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.5. Above and Belowground Carbon Accumulation by Land Use Type - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.6. Avoided and Sequestered Emissions by Species - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Species	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

5. Activity Data

5.1. Construction Schedule

Phase Name	Phase Type	Start Date	End Date	Days Per Week	Work Days per Phase	Phase Description
Demolition	Demolition	2/1/2023	6/20/2023	5.00	100	—
Site Preparation	Site Preparation	6/21/2023	9/12/2023	5.00	60.0	—
Grading	Grading	9/13/2023	4/16/2024	5.00	155	—
Building Construction	Building Construction	4/17/2024	3/26/2030	5.00	1,550	—
Paving	Paving	3/27/2030	8/27/2030	5.00	110	—
Architectural Coating	Architectural Coating	8/28/2030	1/28/2031	5.00	110	—

5.2. Off-Road Equipment

5.2.1. Unmitigated

Phase Name	Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor
Demolition	Concrete/Industrial Saws	Diesel	Average	1.00	8.00	33.0	0.73
Demolition	Excavators	Diesel	Average	3.00	8.00	36.0	0.38
Demolition	Rubber Tired Dozers	Diesel	Average	2.00	8.00	367	0.40
Site Preparation	Rubber Tired Dozers	Diesel	Average	3.00	8.00	367	0.40
Site Preparation	Tractors/Loaders/Backhoes	Diesel	Average	4.00	8.00	84.0	0.37
Grading	Excavators	Diesel	Average	2.00	8.00	36.0	0.38
Grading	Graders	Diesel	Average	1.00	8.00	148	0.41
Grading	Rubber Tired Dozers	Diesel	Average	1.00	8.00	367	0.40
Grading	Scrapers	Diesel	Average	2.00	8.00	423	0.48
Grading	Tractors/Loaders/Backhoes	Diesel	Average	2.00	8.00	84.0	0.37
Building Construction	Cranes	Diesel	Average	1.00	7.00	367	0.29
Building Construction	Forklifts	Diesel	Average	3.00	8.00	82.0	0.20
Building Construction	Generator Sets	Diesel	Average	1.00	8.00	14.0	0.74
Building Construction	Tractors/Loaders/Backhoes	Diesel	Average	3.00	7.00	84.0	0.37
Building Construction	Welders	Diesel	Average	1.00	8.00	46.0	0.45
Paving	Pavers	Diesel	Average	2.00	8.00	81.0	0.42
Paving	Paving Equipment	Diesel	Average	2.00	8.00	89.0	0.36
Paving	Rollers	Diesel	Average	2.00	8.00	36.0	0.38
Architectural Coating	Air Compressors	Diesel	Average	1.00	6.00	37.0	0.48

5.2.2. Mitigated

Phase Name	Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor
Demolition	Concrete/Industrial Saws	Diesel	Average	1.00	8.00	33.0	0.73
Demolition	Excavators	Diesel	Average	3.00	8.00	36.0	0.38
Demolition	Rubber Tired Dozers	Diesel	Average	2.00	8.00	367	0.40
Site Preparation	Rubber Tired Dozers	Diesel	Average	3.00	8.00	367	0.40
Site Preparation	Tractors/Loaders/Backhoes	Diesel	Average	4.00	8.00	84.0	0.37
Grading	Excavators	Diesel	Average	2.00	8.00	36.0	0.38
Grading	Graders	Diesel	Average	1.00	8.00	148	0.41
Grading	Rubber Tired Dozers	Diesel	Average	1.00	8.00	367	0.40
Grading	Scrapers	Diesel	Average	2.00	8.00	423	0.48
Grading	Tractors/Loaders/Backhoes	Diesel	Average	2.00	8.00	84.0	0.37
Building Construction	Cranes	Diesel	Average	1.00	7.00	367	0.29
Building Construction	Forklifts	Diesel	Average	3.00	8.00	82.0	0.20
Building Construction	Generator Sets	Diesel	Average	1.00	8.00	14.0	0.74
Building Construction	Tractors/Loaders/Backhoes	Diesel	Average	3.00	7.00	84.0	0.37
Building Construction	Welders	Diesel	Average	1.00	8.00	46.0	0.45
Paving	Pavers	Diesel	Average	2.00	8.00	81.0	0.42
Paving	Paving Equipment	Diesel	Average	2.00	8.00	89.0	0.36
Paving	Rollers	Diesel	Average	2.00	8.00	36.0	0.38
Architectural Coating	Air Compressors	Diesel	Average	1.00	6.00	37.0	0.48

5.3. Construction Vehicles

5.3.1. Unmitigated

Phase Name	Trip Type	One-Way Trips per Day	Miles per Trip	Vehicle Mix
Demolition	—	—	—	—

Demolition	Worker	15.0	18.5	LDA,LDT1,LDT2
Demolition	Vendor	—	10.2	HHDT,MHDT
Demolition	Hauling	0.00	20.0	HHDT
Demolition	Onsite truck	—	—	HHDT
Site Preparation	—	—	—	—
Site Preparation	Worker	17.5	18.5	LDA,LDT1,LDT2
Site Preparation	Vendor	—	10.2	HHDT,MHDT
Site Preparation	Hauling	0.00	20.0	HHDT
Site Preparation	Onsite truck	—	—	HHDT
Grading	—	—	—	—
Grading	Worker	20.0	18.5	LDA,LDT1,LDT2
Grading	Vendor	—	10.2	HHDT,MHDT
Grading	Hauling	0.00	20.0	HHDT
Grading	Onsite truck	—	—	HHDT
Building Construction	—	—	—	—
Building Construction	Worker	1,977	18.5	LDA,LDT1,LDT2
Building Construction	Vendor	305	10.2	HHDT,MHDT
Building Construction	Hauling	0.00	20.0	HHDT
Building Construction	Onsite truck	—	—	HHDT
Paving	—	—	—	—
Paving	Worker	15.0	18.5	LDA,LDT1,LDT2
Paving	Vendor	—	10.2	HHDT,MHDT
Paving	Hauling	0.00	20.0	HHDT
Paving	Onsite truck	—	—	HHDT
Architectural Coating	—	—	—	—
Architectural Coating	Worker	395	18.5	LDA,LDT1,LDT2
Architectural Coating	Vendor	—	10.2	HHDT,MHDT
Architectural Coating	Hauling	0.00	20.0	HHDT

Architectural Coating	Onsite truck	—	—	HHDT

5.3.2. Mitigated

Phase Name	Trip Type	One-Way Trips per Day	Miles per Trip	Vehicle Mix
Demolition	—	—	—	—
Demolition	Worker	15.0	10.0	LDA,LDT1,LDT2
Demolition	Vendor	—	10.2	HHDT,MHDT
Demolition	Hauling	0.00	20.0	HHDT
Demolition	Onsite truck	—	—	HHDT
Site Preparation	—	—	—	—
Site Preparation	Worker	17.5	10.0	LDA,LDT1,LDT2
Site Preparation	Vendor	—	10.2	HHDT,MHDT
Site Preparation	Hauling	0.00	20.0	HHDT
Site Preparation	Onsite truck	—	—	HHDT
Grading	—	—	—	—
Grading	Worker	20.0	10.0	LDA,LDT1,LDT2
Grading	Vendor	—	10.2	HHDT,MHDT
Grading	Hauling	0.00	20.0	HHDT
Grading	Onsite truck	—	—	HHDT
Building Construction	—	—	—	—
Building Construction	Worker	1,977	10.0	LDA,LDT1,LDT2
Building Construction	Vendor	305	10.2	HHDT,MHDT
Building Construction	Hauling	0.00	20.0	HHDT
Building Construction	Onsite truck	—	—	HHDT
Paving	—	—	—	—
Paving	Worker	15.0	10.0	LDA,LDT1,LDT2
Paving	Vendor	—	10.2	HHDT,MHDT
Paving	Hauling	0.00	20.0	HHDT

Paving	Onsite truck	—	—	HHDT
Architectural Coating	—	—	—	—
Architectural Coating	Worker	395	10.0	LDA,LDT1,LDT2
Architectural Coating	Vendor	—	10.2	HHDT,MHDT
Architectural Coating	Hauling	0.00	20.0	HHDT
Architectural Coating	Onsite truck	—	—	HHDT

5.4. Vehicles

5.4.1. Construction Vehicle Control Strategies

Non-applicable. No control strategies activated by user.

5.5. Architectural Coatings

Phase Name	Residential Interior Area Coated (sq ft)	Residential Exterior Area Coated (sq ft)	Non-Residential Interior Area Coated (sq ft)	Non-Residential Exterior Area Coated (sq ft)	Parking Area Coated (sq ft)
Architectural Coating	6,041,527	2,013,842	0.00	0.00	—

5.6. Dust Mitigation

5.6.1. Construction Earthmoving Activities

Phase Name	Material Imported (cy)	Material Exported (cy)	Acres Graded (acres)	Material Demolished (sq. ft.)	Acres Paved (acres)
Demolition	0.00	0.00	0.00	—	—
Site Preparation	—	—	90.0	0.00	—
Grading	—	—	465	0.00	—
Paving	0.00	0.00	0.00	0.00	2.28

5.6.2. Construction Earthmoving Control Strategies

Control Strategies Applied	Frequency (per day)	PM10 Reduction	PM2.5 Reduction
Water Exposed Area	2	61%	61%

5.7. Construction Paving

Land Use	Area Paved (acres)	% Asphalt
Single Family Housing	2.28	0%
Apartments High Rise	—	0%
Condo/Townhouse	—	0%

5.8. Construction Electricity Consumption and Emissions Factors

kWh per Year and Emission Factor (lb/MWh)

Year	kWh per Year	CO2	CH4	N2O
2023	0.00	532	0.03	< 0.005
2024	0.00	532	0.03	< 0.005
2025	0.00	532	0.03	< 0.005
2026	0.00	532	0.03	< 0.005
2027	0.00	532	0.03	< 0.005
2028	0.00	532	0.03	< 0.005
2029	0.00	532	0.03	< 0.005
2030	0.00	532	0.03	< 0.005
2031	0.00	532	0.03	< 0.005

5.9. Operational Mobile Sources

5.9.1. Unmitigated

Land Use Type	Trips/Weekday	Trips/Saturday	Trips/Sunday	Trips/Year	VMT/Weekday	VMT/Saturday	VMT/Sunday	VMT/Year
Total all Land Uses	14,042	14,042	14,042	5,125,330	149,691	149,691	149,691	54,637,187

5.9.2. Mitigated

Land Use Type	Trips/Weekday	Trips/Saturday	Trips/Sunday	Trips/Year	VMT/Weekday	VMT/Saturday	VMT/Sunday	VMT/Year

Total all Land Uses	14,014	14,014	14,014	5,115,079	149,392	149,392	149,392	54,527,913

5.10. Operational Area Sources

5.10.1. Hearths

5.10.1.1. Unmitigated

5.10.1.2. Mitigated

5.10.2. Architectural Coatings

Residential Interior Area Coated (sq ft)	Residential Exterior Area Coated (sq ft)	Non-Residential Interior Area Coated (sq ft)	Non-Residential Exterior Area Coated (sq ft)	Parking Area Coated (sq ft)
6041526.75	2,013,842	0.00	0.00	—

5.10.3. Landscape Equipment

Season	Unit	Value
Snow Days	day/yr	0.00
Summer Days	day/yr	250

5.10.4. Landscape Equipment - Mitigated

Season	Unit	Value
Snow Days	day/yr	0.00
Summer Days	day/yr	250

5.11. Operational Energy Consumption

5.11.1. Unmitigated

Electricity (kWh/yr) and CO2 and CH4 and N2O and Natural Gas (kBTU/yr)

Land Use	Electricity (kWh/yr)	CO2	CH4	N2O	Natural Gas (kBTU/yr)
Single Family Housing	1,575,192	532	0.0330	0.0040	6,476,971
Apartments High Rise	9,525,770	532	0.0330	0.0040	24,359,055
Condo/Townhouse	2,109,126	532	0.0330	0.0040	8,196,399

5.11.2. Mitigated

Electricity (kWh/yr) and CO2 and CH4 and N2O and Natural Gas (kBTU/yr)

Land Use	Electricity (kWh/yr)	CO2	CH4	N2O	Natural Gas (kBTU/yr)
Single Family Housing	1,575,192	532	0.0330	0.0040	6,476,971
Apartments High Rise	9,525,770	532	0.0330	0.0040	24,359,055
Condo/Townhouse	2,109,126	532	0.0330	0.0040	8,196,399

5.12. Operational Water and Wastewater Consumption

5.12.1. Unmitigated

Land Use	Indoor Water (gal/year)	Outdoor Water (gal/year)
Single Family Housing	8,628,003	47,588,841
Apartments High Rise	91,990,353	0.00
Condo/Townhouse	18,131,311	0.00

5.12.2. Mitigated

Land Use	Indoor Water (gal/year)	Outdoor Water (gal/year)
Single Family Housing	8,628,003	47,588,841
Apartments High Rise	91,990,353	0.00
Condo/Townhouse	18,131,311	0.00

5.13. Operational Waste Generation

5.13.1. Unmitigated

Land Use	Waste (ton/year)	Cogeneration (kWh/year)
Single Family Housing	200	—
Apartments High Rise	1,632	—
Condo/Townhouse	322	—

5.13.2. Mitigated

Land Use	Waste (ton/year)	Cogeneration (kWh/year)
Single Family Housing	200	—
Apartments High Rise	1,632	—
Condo/Townhouse	322	—

5.14. Operational Refrigeration and Air Conditioning Equipment

5.14.1. Unmitigated

Land Use Type	Equipment Type	Refrigerant	GWP	Quantity (kg)	Operations Leak Rate	Service Leak Rate	Times Serviced
Single Family Housing	Average room A/C & Other residential A/C and heat pumps	R-410A	2,088	< 0.005	2.50	2.50	10.0
Single Family Housing	Household refrigerators and/or freezers	R-134a	1,430	0.12	0.60	0.00	1.00
Apartments High Rise	Average room A/C & Other residential A/C and heat pumps	R-410A	2,088	< 0.005	2.50	2.50	10.0
Apartments High Rise	Household refrigerators and/or freezers	R-134a	1,430	0.12	0.60	0.00	1.00
Condo/Townhouse	Average room A/C & Other residential A/C and heat pumps	R-410A	2,088	< 0.005	2.50	2.50	10.0

Condo/Townhouse	Household refrigerators and/or freezers	R-134a	1,430	0.12	0.60	0.00	1.00

5.14.2. Mitigated

Land Use Type	Equipment Type	Refrigerant	GWP	Quantity (kg)	Operations Leak Rate	Service Leak Rate	Times Serviced
Single Family Housing	Average room A/C & Other residential A/C and heat pumps	R-410A	2,088	< 0.005	2.50	2.50	10.0
Single Family Housing	Household refrigerators and/or freezers	R-134a	1,430	0.12	0.60	0.00	1.00
Apartments High Rise	Average room A/C & Other residential A/C and heat pumps	R-410A	2,088	< 0.005	2.50	2.50	10.0
Apartments High Rise	Household refrigerators and/or freezers	R-134a	1,430	0.12	0.60	0.00	1.00
Condo/Townhouse	Average room A/C & Other residential A/C and heat pumps	R-410A	2,088	< 0.005	2.50	2.50	10.0
Condo/Townhouse	Household refrigerators and/or freezers	R-134a	1,430	0.12	0.60	0.00	1.00

5.15. Operational Off-Road Equipment

5.15.1. Unmitigated

Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor

5.15.2. Mitigated

Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor

5.16. Stationary Sources

5.16.1. Emergency Generators and Fire Pumps

Equipment Type	Fuel Type	Number per Day	Hours per Day	Hours per Year	Horsepower	Load Factor

5.16.2. Process Boilers

Equipment Type	Fuel Type	Number	Boiler Rating (MMBtu/hr)	Daily Heat Input (MMBtu/day)	Annual Heat Input (MMBtu/yr)

5.17. User Defined

Equipment Type	Fuel Type
—	—

5.18. Vegetation

5.18.1. Land Use Change

5.18.1.1. Unmitigated

Vegetation Land Use Type	Vegetation Soil Type	Initial Acres	Final Acres

5.18.1.2. Mitigated

Vegetation Land Use Type	Vegetation Soil Type	Initial Acres	Final Acres

5.18.1. Biomass Cover Type

5.18.1.1. Unmitigated

Biomass Cover Type	Initial Acres	Final Acres

5.18.1.2. Mitigated

Biomass Cover Type	Initial Acres	Final Acres

5.18.2. Sequestration

5.18.2.1. Unmitigated

Tree Type	Number	Electricity Saved (kWh/year)	Natural Gas Saved (btu/year)

5.18.2.2. Mitigated

Tree Type	Number	Electricity Saved (kWh/year)	Natural Gas Saved (btu/year)

6. Climate Risk Detailed Report

6.1. Climate Risk Summary

Cal-Adapt midcentury 2040–2059 average projections for four hazards are reported below for your project location. These are under Representation Concentration Pathway (RCP) 8.5 which assumes GHG emissions will continue to rise strongly through 2050 and then plateau around 2100.

Climate Hazard	Result for Project Location	Unit
Temperature and Extreme Heat	16.9	annual days of extreme heat
Extreme Precipitation	5.05	annual days with precipitation above 20 mm
Sea Level Rise	0.00	meters of inundation depth
Wildfire	0.00	annual hectares burned

Temperature and Extreme Heat data are for grid cell in which your project are located. The projection is based on the 98th historical percentile of daily maximum/minimum temperatures from observed historical data (32 climate model ensemble from Cal-Adapt, 2040–2059 average under RCP 8.5). Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.
Extreme Precipitation data are for the grid cell in which your project are located. The threshold of 20 mm is equivalent to about ¾ an inch of rain, which would be light to moderate rainfall if received over a full day or heavy rain if received over a period of 2 to 4 hours. Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.
Sea Level Rise data are for the grid cell in which your project are located. The projections are from Radke et al. (2017), as reported in Cal-Adapt (Radke et al., 2017, CEC-500-2017-008), and consider inundation location and depth for the San Francisco Bay, the Sacramento-San Joaquin River Delta and California coast resulting different increments of sea level rise coupled with extreme storm events. Users may select from four scenarios to view the range in potential inundation depth for the grid cell. The four scenarios are: No rise, 0.5 meter, 1.0 meter, 1.41 meters

Wildfire data are for the grid cell in which your project are located. The projections are from UC Davis, as reported in Cal-Adapt (2040–2059 average under RCP 8.5), and consider historical data of climate, vegetation, population density, and large (> 400 ha) fire history. Users may select from four model simulations to view the range in potential wildfire probabilities for the grid cell. The four simulations make different assumptions about expected rainfall and temperature are: Warmer/drier (HadGEM2-ES), Cooler/wetter (CNRM-CM5), Average conditions (CanESM2), Range of different rainfall and temperature possibilities (MIROC5). Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.

6.2. Initial Climate Risk Scores

Climate Hazard	Exposure Score	Sensitivity Score	Adaptive Capacity Score	Vulnerability Score
Temperature and Extreme Heat	2	0	0	N/A
Extreme Precipitation	N/A	N/A	N/A	N/A
Sea Level Rise	1	0	0	N/A
Wildfire	1	0	0	N/A
Flooding	N/A	N/A	N/A	N/A
Drought	N/A	N/A	N/A	N/A
Snowpack Reduction	N/A	N/A	N/A	N/A
Air Quality Degradation	0	0	0	N/A

The sensitivity score reflects the extent to which a project would be adversely affected by exposure to a climate hazard. Exposure is rated on a scale of 1 to 5, with a score of 5 representing the greatest exposure.
The adaptive capacity of a project refers to its ability to manage and reduce vulnerabilities from projected climate hazards. Adaptive capacity is rated on a scale of 1 to 5, with a score of 5 representing the greatest ability to adapt.
The overall vulnerability scores are calculated based on the potential impacts and adaptive capacity assessments for each hazard. Scores do not include implementation of climate risk reduction measures.

6.3. Adjusted Climate Risk Scores

Climate Hazard	Exposure Score	Sensitivity Score	Adaptive Capacity Score	Vulnerability Score
Temperature and Extreme Heat	2	1	1	3
Extreme Precipitation	N/A	N/A	N/A	N/A
Sea Level Rise	1	1	1	2
Wildfire	1	1	1	2
Flooding	N/A	N/A	N/A	N/A
Drought	N/A	N/A	N/A	N/A
Snowpack Reduction	N/A	N/A	N/A	N/A
Air Quality Degradation	1	1	1	2

The sensitivity score reflects the extent to which a project would be adversely affected by exposure to a climate hazard. Exposure is rated on a scale of 1 to 5, with a score of 5 representing the greatest exposure.
The adaptive capacity of a project refers to its ability to manage and reduce vulnerabilities from projected climate hazards. Adaptive capacity is rated on a scale of 1 to 5, with a score of 5 representing the greatest ability to adapt.
The overall vulnerability scores are calculated based on the potential impacts and adaptive capacity assessments for each hazard. Scores include implementation of climate risk reduction measures.

6.4. Climate Risk Reduction Measures

7. Health and Equity Details

7.1. CalEnviroScreen 4.0 Scores

The maximum CalEnviroScreen score is 100. A high score (i.e., greater than 50) reflects a higher pollution burden compared to other census tracts in the state.

Indicator	Result for Project Census Tract
Exposure Indicators	—
AQ-Ozone	70.5
AQ-PM	91.4
AQ-DPM	27.5
Drinking Water	94.6
Lead Risk Housing	0.63
Pesticides	0.00
Toxic Releases	63.8
Traffic	64.2
Effect Indicators	—
CleanUp Sites	11.8
Groundwater	35.0
Haz Waste Facilities/Generators	77.0
Impaired Water Bodies	23.9
Solid Waste	0.00
Sensitive Population	—
Asthma	21.8

Cardio-vascular	54.2
Low Birth Weights	72.9
Socioeconomic Factor Indicators	—
Education	39.5
Housing	1.93
Linguistic	81.9
Poverty	17.2
Unemployment	33.6

7.2. Healthy Places Index Scores

The maximum Health Places Index score is 100. A high score (i.e., greater than 50) reflects healthier community conditions compared to other census tracts in the state.

Indicator	Result for Project Census Tract
Economic	—
Above Poverty	91.518029
Employed	85.29449506
Median HI	92.23662261
Education	—
Bachelor's or higher	82.16348005
High school enrollment	25.92069806
Preschool enrollment	79.32760169
Transportation	—
Auto Access	91.71050943
Active commuting	26.15167458
Social	—
2-parent households	63.95483126
Voting	60.09239061
Neighborhood	—
Alcohol availability	50.891826

Park access	55.78082895
Retail density	58.37289876
Supermarket access	43.94969845
Tree canopy	44.89926857
Housing	—
Homeownership	79.76389067
Housing habitability	95.05966893
Low-inc homeowner severe housing cost burden	93.13486462
Low-inc renter severe housing cost burden	89.06711151
Uncrowded housing	82.07365584
Health Outcomes	—
Insured adults	81.30373412
Arthritis	90.1
Asthma ER Admissions	79.0
High Blood Pressure	78.2
Cancer (excluding skin)	66.1
Asthma	95.7
Coronary Heart Disease	94.7
Chronic Obstructive Pulmonary Disease	95.5
Diagnosed Diabetes	80.8
Life Expectancy at Birth	52.7
Cognitively Disabled	92.5
Physically Disabled	93.4
Heart Attack ER Admissions	42.2
Mental Health Not Good	91.8
Chronic Kidney Disease	93.4
Obesity	95.5
Pedestrian Injuries	42.8

Physical Health Not Good	92.3
Stroke	93.8
Health Risk Behaviors	—
Binge Drinking	69.8
Current Smoker	91.5
No Leisure Time for Physical Activity	80.7
Climate Change Exposures	—
Wildfire Risk	0.0
SLR Inundation Area	0.0
Children	75.0
Elderly	81.3
English Speaking	49.4
Foreign-born	72.0
Outdoor Workers	84.9
Climate Change Adaptive Capacity	—
Impervious Surface Cover	80.2
Traffic Density	51.9
Traffic Access	23.0
Other Indices	—
Hardship	10.7
Other Decision Support	—
2016 Voting	73.0

7.3. Overall Health & Equity Scores

Metric	Result for Project Census Tract
CalEnviroScreen 4.0 Score for Project Location (a)	46.0
Healthy Places Index Score for Project Location (b)	87.0
Project Located in a Designated Disadvantaged Community (Senate Bill 535)	No

Project Located in a Low-Income Community (Assembly Bill 1550)	No
Project Located in a Community Air Protection Program Community (Assembly Bill 617)	No

a: The maximum CalEnviroScreen score is 100. A high score (i.e., greater than 50) reflects a higher pollution burden compared to other census tracts in the state.
b: The maximum Health Places Index score is 100. A high score (i.e., greater than 50) reflects healthier community conditions compared to other census tracts in the state.

7.4. Health & Equity Measures

No Health & Equity Measures selected.

7.5. Evaluation Scorecard

Health & Equity Evaluation Scorecard not completed.

7.6. Health & Equity Custom Measures

No Health & Equity Custom Measures created.

8. User Changes to Default Data

Screen	Justification
Land Use	Per project description
Operations: Vehicle Data	227,461 total trips per traffic analysis. Estimated as all Condo/Townhouse trips for simplicity.
Operations: Hearths	No woodstoves or fireplaces
Construction: Construction Phases	Phase lengths adjusted proportionally for 9 year construction schedule
Construction: Architectural Coatings	Mitigation
Operations: Architectural Coatings	Mitigation

Appendix C:

CalEEMod Existing Emission Output

Chino Hills General Plan - Existing Detailed Report

Table of Contents

1. Basic Project Information

1.1. Basic Project Information

1.2. Land Use Types

1.3. User-Selected Emission Reduction Measures by Emissions Sector

2. Emissions Summary

2.4. Operations Emissions Compared Against Thresholds

2.5. Operations Emissions by Sector, Unmitigated

4. Operations Emissions Details

4.1. Mobile Emissions by Land Use

4.1.1. Unmitigated

4.2. Energy

4.2.1. Electricity Emissions By Land Use - Unmitigated

4.2.3. Natural Gas Emissions By Land Use - Unmitigated

4.3. Area Emissions by Source

4.3.1. Unmitigated

4.4. Water Emissions by Land Use

4.4.1. Unmitigated

4.5. Waste Emissions by Land Use

4.5.1. Unmitigated

4.6. Refrigerant Emissions by Land Use

4.6.1. Unmitigated

4.7. Offroad Emissions By Equipment Type

4.7.1. Unmitigated

4.8. Stationary Emissions By Equipment Type

4.8.1. Unmitigated

4.9. User Defined Emissions By Equipment Type

4.9.1. Unmitigated

4.10. Soil Carbon Accumulation By Vegetation Type

4.10.1. Soil Carbon Accumulation By Vegetation Type - Unmitigated

4.10.2. Above and Belowground Carbon Accumulation by Land Use Type - Unmitigated

4.10.3. Avoided and Sequestered Emissions by Species - Unmitigated

5. Activity Data

5.9. Operational Mobile Sources

5.9.1. Unmitigated

5.10. Operational Area Sources

5.10.1. Hearths

5.10.1.1. Unmitigated

5.10.2. Architectural Coatings

5.10.3. Landscape Equipment

5.11. Operational Energy Consumption

5.11.1. Unmitigated

5.12. Operational Water and Wastewater Consumption

5.12.1. Unmitigated

5.13. Operational Waste Generation

5.13.1. Unmitigated

5.14. Operational Refrigeration and Air Conditioning Equipment

5.14.1. Unmitigated

5.15. Operational Off-Road Equipment

5.15.1. Unmitigated

5.16. Stationary Sources

5.16.1. Emergency Generators and Fire Pumps

5.16.2. Process Boilers

5.17. User Defined

5.18. Vegetation

5.18.1. Land Use Change

5.18.1.1. Unmitigated

5.18.1. Biomass Cover Type

5.18.1.1. Unmitigated

5.18.2. Sequestration

5.18.2.1. Unmitigated

6. Climate Risk Detailed Report

6.1. Climate Risk Summary

6.2. Initial Climate Risk Scores

6.3. Adjusted Climate Risk Scores

6.4. Climate Risk Reduction Measures

7. Health and Equity Details

7.1. CalEnviroScreen 4.0 Scores

7.2. Healthy Places Index Scores

7.3. Overall Health & Equity Scores

7.4. Health & Equity Measures

7.5. Evaluation Scorecard

7.6. Health & Equity Custom Measures

8. User Changes to Default Data

1. Basic Project Information

1.1. Basic Project Information

Data Field	Value
Project Name	Chino Hills General Plan - Existing
Operational Year	2040
Lead Agency	—
Land Use Scale	Plan/community
Analysis Level for Defaults	County
Windspeed (m/s)	2.60
Precipitation (days)	18.8
Location	Chino Hills, CA, USA
County	San Bernardino-South Coast
City	Chino Hills
Air District	South Coast AQMD
Air Basin	South Coast
TAZ	5201
EDFZ	10
Electric Utility	Southern California Edison
Gas Utility	Southern California Gas
App Version	2022.1.1.29

1.2. Land Use Types

Land Use Subtype	Size	Unit	Lot Acreage	Building Area (sq ft)	Landscape Area (sq ft)	Special Landscape Area (sq ft)	Population	Description
Single Family Housing	20,071	Dwelling Unit	10,000	39,138,450	235,088,753	—	66,435	—

Apartments High Rise	4,997	Dwelling Unit	353	4,797,120	0.00	—	16,540	—
Condo/Townhouse	633	Dwelling Unit	1,438	670,980	0.00	—	2,095	—

1.3. User-Selected Emission Reduction Measures by Emissions Sector

No measures selected

2. Emissions Summary

2.4. Operations Emissions Compared Against Thresholds

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Un/Mit.	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	7,623	1,183	14,056	36.7	960	2,453	3,412	959	622	1,582	103,811	3,327,350	3,431,162	1,594	107	1,637	3,504,614
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	7,602	1,227	12,713	35.3	960	2,453	3,412	959	622	1,582	103,811	3,177,348	3,281,159	1,595	110	354	3,354,172
Average Daily (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	1,989	834	6,631	23.6	88.4	2,423	2,511	87.8	615	703	20,850	2,772,096	2,792,946	1,587	103	888	2,864,075
Annual (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	363	152	1,210	4.30	16.1	442	458	16.0	112	128	3,452	458,952	462,404	263	17.0	147	474,180

2.5. Operations Emissions by Sector, Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Sector	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	562	577	7,210	22.8	10.1	2,453	2,463	9.50	622	632	—	2,339,767	2,339,767	66.9	90.9	1,317	2,369,830
Area	7,051	430	6,771	12.8	936	—	936	936	—	936	89,061	459,984	549,045	8.66	8.72	—	551,861
Energy	10.3	176	74.7	1.12	14.2	—	14.2	14.2	—	14.2	—	481,282	481,282	35.8	2.36	—	482,880
Water	—	—	—	—	—	—	—	—	—	—	2,053	46,318	48,371	213	5.35	—	55,299
Waste	—	—	—	—	—	—	—	—	—	—	12,698	0.00	12,698	1,269	0.00	—	44,424
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	319	319
Total	7,623	1,183	14,056	36.7	960	2,453	3,412	959	622	1,582	103,811	3,327,350	3,431,162	1,594	107	1,637	3,504,614
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	541	621	5,867	21.3	10.1	2,453	2,463	9.50	622	632	—	2,189,764	2,189,764	68.2	93.6	34.2	2,219,388
Area	7,051	430	6,771	12.8	936	—	936	936	—	936	89,061	459,984	549,045	8.66	8.72	—	551,861
Energy	10.3	176	74.7	1.12	14.2	—	14.2	14.2	—	14.2	—	481,282	481,282	35.8	2.36	—	482,880
Water	—	—	—	—	—	—	—	—	—	—	2,053	46,318	48,371	213	5.35	—	55,299
Waste	—	—	—	—	—	—	—	—	—	—	12,698	0.00	12,698	1,269	0.00	—	44,424
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	319	319
Total	7,602	1,227	12,713	35.3	960	2,453	3,412	959	622	1,582	103,811	3,177,348	3,281,159	1,595	110	354	3,354,172
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	535	629	6,093	21.6	10.1	2,423	2,433	9.50	615	625	—	2,212,990	2,212,990	68.2	94.3	569	2,243,353
Area	1,443	29.5	464	0.88	64.1	—	64.1	64.1	—	64.1	6,100	31,506	37,606	0.59	0.60	—	37,799
Energy	10.3	176	74.7	1.12	14.2	—	14.2	14.2	—	14.2	—	481,282	481,282	35.8	2.36	—	482,880

Water	—	—	—	—	—	—	—	—	—	—	2,053	46,318	48,371	213	5.35	—	55,299
Waste	—	—	—	—	—	—	—	—	—	—	12,698	0.00	12,698	1,269	0.00	—	44,424
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	319	319
Total	1,989	834	6,631	23.6	88.4	2,423	2,511	87.8	615	703	20,850	2,772,096	2,792,946	1,587	103	888	2,864,075
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	97.7	115	1,112	3.94	1.84	442	444	1.73	112	114	—	366,386	366,386	11.3	15.6	94.2	371,413
Area	263	5.38	84.6	0.16	11.7	—	11.7	11.7	—	11.7	1,010	5,216	6,226	0.10	0.10	—	6,258
Energy	1.87	32.0	13.6	0.20	2.59	—	2.59	2.59	—	2.59	—	79,682	79,682	5.92	0.39	—	79,946
Water	—	—	—	—	—	—	—	—	—	—	340	7,668	8,008	35.3	0.89	—	9,155
Waste	—	—	—	—	—	—	—	—	—	—	2,102	0.00	2,102	210	0.00	—	7,355
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	52.9	52.9
Total	363	152	1,210	4.30	16.1	442	458	16.0	112	128	3,452	458,952	462,404	263	17.0	147	474,180

4. Operations Emissions Details

4.1. Mobile Emissions by Land Use

4.1.1. Unmitigated

Mobile source emissions results are presented in Sections 2.6. No further detailed breakdown of emissions is available.

4.2. Energy

4.2.1. Electricity Emissions By Land Use - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	222,606	222,606	13.8	1.67	—	223,450
Apartments High Rise	—	—	—	—	—	—	—	—	—	—	—	31,435	31,435	1.95	0.24	—	31,554
Condo/Townhouse	—	—	—	—	—	—	—	—	—	—	—	4,473	4,473	0.28	0.03	—	4,490
Total	—	—	—	—	—	—	—	—	—	—	—	258,514	258,514	16.0	1.94	—	259,494
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	222,606	222,606	13.8	1.67	—	223,450
Apartments High Rise	—	—	—	—	—	—	—	—	—	—	—	31,435	31,435	1.95	0.24	—	31,554
Condo/Townhouse	—	—	—	—	—	—	—	—	—	—	—	4,473	4,473	0.28	0.03	—	4,490
Total	—	—	—	—	—	—	—	—	—	—	—	258,514	258,514	16.0	1.94	—	259,494
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	36,855	36,855	2.29	0.28	—	36,995
Apartments High Rise	—	—	—	—	—	—	—	—	—	—	—	5,204	5,204	0.32	0.04	—	5,224
Condo/Townhouse	—	—	—	—	—	—	—	—	—	—	—	741	741	0.05	0.01	—	743
Total	—	—	—	—	—	—	—	—	—	—	—	42,800	42,800	2.65	0.32	—	42,962

4.2.3. Natural Gas Emissions By Land Use - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	9.28	159	67.5	1.01	12.8	—	12.8	12.8	—	12.8	—	201,270	201,270	17.8	0.38	—	201,828
Apartments High Rise	0.81	13.9	5.93	0.09	1.13	—	1.13	1.13	—	1.13	—	17,676	17,676	1.56	0.03	—	17,725
Condo/Townhouse	0.18	3.01	1.28	0.02	0.24	—	0.24	0.24	—	0.24	—	3,822	3,822	0.34	0.01	—	3,833
Total	10.3	176	74.7	1.12	14.2	—	14.2	14.2	—	14.2	—	222,768	222,768	19.7	0.42	—	223,386
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	9.28	159	67.5	1.01	12.8	—	12.8	12.8	—	12.8	—	201,270	201,270	17.8	0.38	—	201,828
Apartments High Rise	0.81	13.9	5.93	0.09	1.13	—	1.13	1.13	—	1.13	—	17,676	17,676	1.56	0.03	—	17,725
Condo/Townhouse	0.18	3.01	1.28	0.02	0.24	—	0.24	0.24	—	0.24	—	3,822	3,822	0.34	0.01	—	3,833
Total	10.3	176	74.7	1.12	14.2	—	14.2	14.2	—	14.2	—	222,768	222,768	19.7	0.42	—	223,386
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	1.69	28.9	12.3	0.18	2.34	—	2.34	2.34	—	2.34	—	33,323	33,323	2.95	0.06	—	33,415

Apartments	0.15	2.54	1.08	0.02	0.21	—	0.21	0.21	—	0.21	—	2,926	2,926	0.26	0.01	—	2,935
Condo/Townhouse	0.03	0.55	0.23	< 0.005	0.04	—	0.04	0.04	—	0.04	—	633	633	0.06	< 0.005	—	635
Total	1.87	32.0	13.6	0.20	2.59	—	2.59	2.59	—	2.59	—	36,882	36,882	3.26	0.07	—	36,984

4.3. Area Emissions by Source

4.3.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Source	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Hearths	6,020	430	6,771	12.8	936	—	936	936	—	936	89,061	459,984	549,045	8.66	8.72	—	551,861
Consumer Products	955	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	76.5	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	7,051	430	6,771	12.8	936	—	936	936	—	936	89,061	459,984	549,045	8.66	8.72	—	551,861
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Hearths	6,020	430	6,771	12.8	936	—	936	936	—	936	89,061	459,984	549,045	8.66	8.72	—	551,861
Consumer Products	955	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	76.5	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	7,051	430	6,771	12.8	936	—	936	936	—	936	89,061	459,984	549,045	8.66	8.72	—	551,861

Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Hearths	75.2	5.38	84.6	0.16	11.7	—	11.7	11.7	—	11.7	1,010	5,216	6,226	0.10	0.10	—	6,258
Consumer Products	174	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	14.0	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	263	5.38	84.6	0.16	11.7	—	11.7	11.7	—	11.7	1,010	5,216	6,226	0.10	0.10	—	6,258

4.4. Water Emissions by Land Use

4.4.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	1,603	43,990	45,593	167	4.24	—	51,033
Apartments High Rise	—	—	—	—	—	—	—	—	—	—	399	2,066	2,466	41.1	0.99	—	3,786
Condo/Townhouse	—	—	—	—	—	—	—	—	—	—	50.6	262	312	5.20	0.13	—	480
Total	—	—	—	—	—	—	—	—	—	—	2,053	46,318	48,371	213	5.35	—	55,299
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	1,603	43,990	45,593	167	4.24	—	51,033

Apartme High Rise	—	—	—	—	—	—	—	—	—	—	399	2,066	2,466	41.1	0.99	—	3,786
Condo/T ownhous e	—	—	—	—	—	—	—	—	—	—	50.6	262	312	5.20	0.13	—	480
Total	—	—	—	—	—	—	—	—	—	—	2,053	46,318	48,371	213	5.35	—	55,299
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	265	7,283	7,548	27.7	0.70	—	8,449
Apartme nts High Rise	—	—	—	—	—	—	—	—	—	—	66.1	342	408	6.80	0.16	—	627
Condo/T ownhous e	—	—	—	—	—	—	—	—	—	—	8.37	43.3	51.7	0.86	0.02	—	79.4
Total	—	—	—	—	—	—	—	—	—	—	340	7,668	8,008	35.3	0.89	—	9,155

4.5. Waste Emissions by Land Use

4.5.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	10,454	0.00	10,454	1,045	0.00	—	36,574
Apartme nts High Rise	—	—	—	—	—	—	—	—	—	—	1,991	0.00	1,991	199	0.00	—	6,967

Condo/Townhous	—	—	—	—	—	—	—	—	—	—	252	0.00	252	25.2	0.00	—	883
Total	—	—	—	—	—	—	—	—	—	—	12,698	0.00	12,698	1,269	0.00	—	44,424
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	10,454	0.00	10,454	1,045	0.00	—	36,574
Apartments High Rise	—	—	—	—	—	—	—	—	—	—	1,991	0.00	1,991	199	0.00	—	6,967
Condo/Townhouse	—	—	—	—	—	—	—	—	—	—	252	0.00	252	25.2	0.00	—	883
Total	—	—	—	—	—	—	—	—	—	—	12,698	0.00	12,698	1,269	0.00	—	44,424
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	1,731	0.00	1,731	173	0.00	—	6,055
Apartments High Rise	—	—	—	—	—	—	—	—	—	—	330	0.00	330	33.0	0.00	—	1,154
Condo/Townhouse	—	—	—	—	—	—	—	—	—	—	41.8	0.00	41.8	4.17	0.00	—	146
Total	—	—	—	—	—	—	—	—	—	—	2,102	0.00	2,102	210	0.00	—	7,355

4.6. Refrigerant Emissions by Land Use

4.6.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	280	280
Apartments High Rise	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	34.4	34.4
Condo/Townhouse	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	4.81	4.81
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	319	319
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	280	280
Apartments High Rise	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	34.4	34.4
Condo/Townhouse	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	4.81	4.81
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	319	319
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	46.4	46.4
Apartments High Rise	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	5.69	5.69
Condo/Townhouse	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.80	0.80
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	52.9	52.9

4.7. Offroad Emissions By Equipment Type

4.7.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.8. Stationary Emissions By Equipment Type

4.8.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.9. User Defined Emissions By Equipment Type

4.9.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10. Soil Carbon Accumulation By Vegetation Type

4.10.1. Soil Carbon Accumulation By Vegetation Type - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Vegetation	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.2. Above and Belowground Carbon Accumulation by Land Use Type - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.3. Avoided and Sequestered Emissions by Species - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Species	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

5. Activity Data

5.9. Operational Mobile Sources

5.9.1. Unmitigated

Land Use Type	Trips/Weekday	Trips/Saturday	Trips/Sunday	Trips/Year	VMT/Weekday	VMT/Saturday	VMT/Sunday	VMT/Year
Total all Land Uses	227,461	227,461	227,461	83,023,265	3,461,060	3,461,060	3,461,060	1,263,286,928

5.10. Operational Area Sources

5.10.1. Hearths

5.10.1.1. Unmitigated

Hearth Type	Unmitigated (number)
Single Family Housing	—
Wood Fireplaces	1004
Gas Fireplaces	17060
Propane Fireplaces	0
Electric Fireplaces	0
No Fireplaces	2007
Conventional Wood Stoves	0
Catalytic Wood Stoves	0
Non-Catalytic Wood Stoves	0
Pellet Wood Stoves	0
Apartments High Rise	—
Wood Fireplaces	250
Gas Fireplaces	4247
Propane Fireplaces	0
Electric Fireplaces	0
No Fireplaces	500

Conventional Wood Stoves	0
Catalytic Wood Stoves	0
Non-Catalytic Wood Stoves	0
Pellet Wood Stoves	0
Condo/Townhouse	—
Wood Fireplaces	32
Gas Fireplaces	538
Propane Fireplaces	0
Electric Fireplaces	0
No Fireplaces	63
Conventional Wood Stoves	0
Catalytic Wood Stoves	0
Non-Catalytic Wood Stoves	0
Pellet Wood Stoves	0

5.10.2. Architectural Coatings

Residential Interior Area Coated (sq ft)	Residential Exterior Area Coated (sq ft)	Non-Residential Interior Area Coated (sq ft)	Non-Residential Exterior Area Coated (sq ft)	Parking Area Coated (sq ft)
90328263.75	30,109,421	0.00	0.00	—

5.10.3. Landscape Equipment

Season	Unit	Value
Snow Days	day/yr	0.00
Summer Days	day/yr	250

5.11. Operational Energy Consumption

5.11.1. Unmitigated

Electricity (kWh/yr) and CO2 and CH4 and N2O and Natural Gas (kBTU/yr)

Land Use	Electricity (kWh/yr)	CO2	CH4	N2O	Natural Gas (kBTU/yr)
Single Family Housing	152,732,723	532	0.0330	0.0040	628,015,883
Apartments High Rise	21,567,863	532	0.0330	0.0040	55,152,786
Condo/Townhouse	3,069,142	532	0.0330	0.0040	11,927,174

5.12. Operational Water and Wastewater Consumption

5.12.1. Unmitigated

Land Use	Indoor Water (gal/year)	Outdoor Water (gal/year)
Single Family Housing	836,582,863	4,614,279,140
Apartments High Rise	208,280,831	0.00
Condo/Townhouse	26,384,184	0.00

5.13. Operational Waste Generation

5.13.1. Unmitigated

Land Use	Waste (ton/year)	Cogeneration (kWh/year)
Single Family Housing	19,397	—
Apartments High Rise	3,695	—
Condo/Townhouse	468	—

5.14. Operational Refrigeration and Air Conditioning Equipment

5.14.1. Unmitigated

Land Use Type	Equipment Type	Refrigerant	GWP	Quantity (kg)	Operations Leak Rate	Service Leak Rate	Times Serviced
Single Family Housing	Average room A/C & Other residential A/C and heat pumps	R-410A	2,088	< 0.005	2.50	2.50	10.0

Single Family Housing	Household refrigerators and/or freezers	R-134a	1,430	0.12	0.60	0.00	1.00
Apartments High Rise	Average room A/C & Other residential A/C and heat pumps	R-410A	2,088	< 0.005	2.50	2.50	10.0
Apartments High Rise	Household refrigerators and/or freezers	R-134a	1,430	0.12	0.60	0.00	1.00
Condo/Townhouse	Average room A/C & Other residential A/C and heat pumps	R-410A	2,088	< 0.005	2.50	2.50	10.0
Condo/Townhouse	Household refrigerators and/or freezers	R-134a	1,430	0.12	0.60	0.00	1.00

5.15. Operational Off-Road Equipment

5.15.1. Unmitigated

Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor

5.16. Stationary Sources

5.16.1. Emergency Generators and Fire Pumps

Equipment Type	Fuel Type	Number per Day	Hours per Day	Hours per Year	Horsepower	Load Factor

5.16.2. Process Boilers

Equipment Type	Fuel Type	Number	Boiler Rating (MMBtu/hr)	Daily Heat Input (MMBtu/day)	Annual Heat Input (MMBtu/yr)

5.17. User Defined

Equipment Type	Fuel Type

—	—

5.18. Vegetation

5.18.1. Land Use Change

5.18.1.1. Unmitigated

Vegetation Land Use Type	Vegetation Soil Type	Initial Acres	Final Acres

5.18.1. Biomass Cover Type

5.18.1.1. Unmitigated

Biomass Cover Type	Initial Acres	Final Acres

5.18.2. Sequestration

5.18.2.1. Unmitigated

Tree Type	Number	Electricity Saved (kWh/year)	Natural Gas Saved (btu/year)

6. Climate Risk Detailed Report

6.1. Climate Risk Summary

Cal-Adapt midcentury 2040–2059 average projections for four hazards are reported below for your project location. These are under Representation Concentration Pathway (RCP) 8.5 which assumes GHG emissions will continue to rise strongly through 2050 and then plateau around 2100.

Climate Hazard	Result for Project Location	Unit
Temperature and Extreme Heat	16.9	annual days of extreme heat
Extreme Precipitation	5.05	annual days with precipitation above 20 mm
Sea Level Rise	0.00	meters of inundation depth
Wildfire	0.00	annual hectares burned

Temperature and Extreme Heat data are for grid cell in which your project are located. The projection is based on the 98th historical percentile of daily maximum/minimum temperatures from observed historical data (32 climate model ensemble from Cal-Adapt, 2040–2059 average under RCP 8.5). Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.
Extreme Precipitation data are for the grid cell in which your project are located. The threshold of 20 mm is equivalent to about ¾ an inch of rain, which would be light to moderate rainfall if received over a full day or heavy rain if received over a period of 2 to 4 hours. Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.
Sea Level Rise data are for the grid cell in which your project are located. The projections are from Radke et al. (2017), as reported in Cal-Adapt (Radke et al., 2017, CEC-500-2017-008), and consider inundation location and depth for the San Francisco Bay, the Sacramento-San Joaquin River Delta and California coast resulting different increments of sea level rise coupled with extreme storm events. Users may select from four scenarios to view the range in potential inundation depth for the grid cell. The four scenarios are: No rise, 0.5 meter, 1.0 meter, 1.41 meters
Wildfire data are for the grid cell in which your project are located. The projections are from UC Davis, as reported in Cal-Adapt (2040–2059 average under RCP 8.5), and consider historical data of climate, vegetation, population density, and large (> 400 ha) fire history. Users may select from four model simulations to view the range in potential wildfire probabilities for the grid cell. The four simulations make different assumptions about expected rainfall and temperature are: Warmer/drier (HadGEM2-ES), Cooler/wetter (CNRM-CM5), Average conditions (CanESM2), Range of different rainfall and temperature possibilities (MIROC5). Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.

6.2. Initial Climate Risk Scores

Climate Hazard	Exposure Score	Sensitivity Score	Adaptive Capacity Score	Vulnerability Score
Temperature and Extreme Heat	2	0	0	N/A
Extreme Precipitation	N/A	N/A	N/A	N/A
Sea Level Rise	1	0	0	N/A
Wildfire	1	0	0	N/A
Flooding	N/A	N/A	N/A	N/A
Drought	N/A	N/A	N/A	N/A
Snowpack Reduction	N/A	N/A	N/A	N/A
Air Quality Degradation	0	0	0	N/A

The sensitivity score reflects the extent to which a project would be adversely affected by exposure to a climate hazard. Exposure is rated on a scale of 1 to 5, with a score of 5 representing the greatest exposure.
The adaptive capacity of a project refers to its ability to manage and reduce vulnerabilities from projected climate hazards. Adaptive capacity is rated on a scale of 1 to 5, with a score of 5 representing the greatest ability to adapt.
The overall vulnerability scores are calculated based on the potential impacts and adaptive capacity assessments for each hazard. Scores do not include implementation of climate risk reduction measures.

6.3. Adjusted Climate Risk Scores

Climate Hazard	Exposure Score	Sensitivity Score	Adaptive Capacity Score	Vulnerability Score
Temperature and Extreme Heat	2	1	1	3
Extreme Precipitation	N/A	N/A	N/A	N/A
Sea Level Rise	1	1	1	2

Wildfire	1	1	1	2
Flooding	N/A	N/A	N/A	N/A
Drought	N/A	N/A	N/A	N/A
Snowpack Reduction	N/A	N/A	N/A	N/A
Air Quality Degradation	1	1	1	2

The sensitivity score reflects the extent to which a project would be adversely affected by exposure to a climate hazard. Exposure is rated on a scale of 1 to 5, with a score of 5 representing the greatest exposure.
The adaptive capacity of a project refers to its ability to manage and reduce vulnerabilities from projected climate hazards. Adaptive capacity is rated on a scale of 1 to 5, with a score of 5 representing the greatest ability to adapt.
The overall vulnerability scores are calculated based on the potential impacts and adaptive capacity assessments for each hazard. Scores include implementation of climate risk reduction measures.

6.4. Climate Risk Reduction Measures

7. Health and Equity Details

7.1. CalEnviroScreen 4.0 Scores

The maximum CalEnviroScreen score is 100. A high score (i.e., greater than 50) reflects a higher pollution burden compared to other census tracts in the state.

Indicator	Result for Project Census Tract
Exposure Indicators	—
AQ-Ozone	70.5
AQ-PM	91.4
AQ-DPM	27.5
Drinking Water	94.6
Lead Risk Housing	0.63
Pesticides	0.00
Toxic Releases	63.8
Traffic	64.2
Effect Indicators	—
CleanUp Sites	11.8
Groundwater	35.0

Haz Waste Facilities/Generators	77.0
Impaired Water Bodies	23.9
Solid Waste	0.00
Sensitive Population	—
Asthma	21.8
Cardio-vascular	54.2
Low Birth Weights	72.9
Socioeconomic Factor Indicators	—
Education	39.5
Housing	1.93
Linguistic	81.9
Poverty	17.2
Unemployment	33.6

7.2. Healthy Places Index Scores

The maximum Health Places Index score is 100. A high score (i.e., greater than 50) reflects healthier community conditions compared to other census tracts in the state.

Indicator	Result for Project Census Tract
Economic	—
Above Poverty	91.518029
Employed	85.29449506
Median HI	92.23662261
Education	—
Bachelor's or higher	82.16348005
High school enrollment	25.92069806
Preschool enrollment	79.32760169
Transportation	—
Auto Access	91.71050943
Active commuting	26.15167458

Social	—
2-parent households	63.95483126
Voting	60.09239061
Neighborhood	—
Alcohol availability	50.891826
Park access	55.78082895
Retail density	58.37289876
Supermarket access	43.94969845
Tree canopy	44.89926857
Housing	—
Homeownership	79.76389067
Housing habitability	95.05966893
Low-inc homeowner severe housing cost burden	93.13486462
Low-inc renter severe housing cost burden	89.06711151
Uncrowded housing	82.07365584
Health Outcomes	—
Insured adults	81.30373412
Arthritis	90.1
Asthma ER Admissions	79.0
High Blood Pressure	78.2
Cancer (excluding skin)	66.1
Asthma	95.7
Coronary Heart Disease	94.7
Chronic Obstructive Pulmonary Disease	95.5
Diagnosed Diabetes	80.8
Life Expectancy at Birth	52.7
Cognitively Disabled	92.5
Physically Disabled	93.4

Heart Attack ER Admissions	42.2
Mental Health Not Good	91.8
Chronic Kidney Disease	93.4
Obesity	95.5
Pedestrian Injuries	42.8
Physical Health Not Good	92.3
Stroke	93.8
Health Risk Behaviors	—
Binge Drinking	69.8
Current Smoker	91.5
No Leisure Time for Physical Activity	80.7
Climate Change Exposures	—
Wildfire Risk	0.0
SLR Inundation Area	0.0
Children	75.0
Elderly	81.3
English Speaking	49.4
Foreign-born	72.0
Outdoor Workers	84.9
Climate Change Adaptive Capacity	—
Impervious Surface Cover	80.2
Traffic Density	51.9
Traffic Access	23.0
Other Indices	—
Hardship	10.7
Other Decision Support	—
2016 Voting	73.0

7.3. Overall Health & Equity Scores

Metric	Result for Project Census Tract
CalEnviroScreen 4.0 Score for Project Location (a)	46.0
Healthy Places Index Score for Project Location (b)	87.0
Project Located in a Designated Disadvantaged Community (Senate Bill 535)	No
Project Located in a Low-Income Community (Assembly Bill 1550)	No
Project Located in a Community Air Protection Program Community (Assembly Bill 617)	No

a: The maximum CalEnviroScreen score is 100. A high score (i.e., greater than 50) reflects a higher pollution burden compared to other census tracts in the state.
b: The maximum Health Places Index score is 100. A high score (i.e., greater than 50) reflects healthier community conditions compared to other census tracts in the state.

7.4. Health & Equity Measures

No Health & Equity Measures selected.

7.5. Evaluation Scorecard

Health & Equity Evaluation Scorecard not completed.

7.6. Health & Equity Custom Measures

No Health & Equity Custom Measures created.

8. User Changes to Default Data

Screen	Justification
Land Use	Per project description
Operations: Vehicle Data	227,461 total trips per traffic analysis. Estimated as all Condo/Townhouse trips for simplicity.
Operations: Hearths	No woodstoves

and regional movement linkages for species and gene flow. Additional community-owned open space is scattered throughout the city, encompassing over 3,000 acres managed by the city.

Open spaces offer refugia where wildlife can escape interaction with humans and domestic pets, and in some locations, avoid night lighting and vehicles. Native plants are protected in such areas from non-native invasive species, off-road activities and illegal dumping.

7.2 Existing Biological Conditions at the RHNA Sites

SWCA biologists conducted reconnaissance-level field surveys at seven of the eleven RHNA sites on July 13 and 14, 2022 (Sites 1 through 7). General biological conditions were noted, including dominant vegetation and existing land uses. In addition, site-specific desktop review was conducted for the remaining four sites. Below is a summary of the information gathered from the field surveys and desktop review.

Site 1 – The Shoppes II: This site supports annual grassland and developed land. During the site visits conducted in the development of this technical report, ruderal species such as short-pod mustard (*Hirschfeldia incana*) and Russian thistle (*Salsola tragus*) were observed. Grasses had been recently mowed and were not identifiable beyond being annual non-native grasses.

Site 2 – Community Park Overflow: This site is graded and only supports disturbed and developed land. Where there was a soil surface, common ruderal species such as horseweed (*Erigeron* sp.) and puncture vine (*Tribulus terrestris*) were observed during the site visits conducted in support of this technical report.

Site 3 – Los Serranos Golf Course: This site is largely developed with non-native ornamental vegetation. However, the site includes an incised channel that supports disturbed southern riparian scrub co-dominated by black willow (*Salix gooddingii*) and arroyo willow (*Salix lasiolepis*) along with non-native trees such as Mexican fan palm (*Washingtonia robusta*) and edible fig (*Ficus carica*). The understory largely comprises non-native species such as castor bean (*Ricinus communis*), umbrella plant (*Cyperus involucratus*), and small tamarisk (*Tamarix* sp.) individuals, but did include cattail (*Typha* sp.) along the margins of the channel. Two male least Bell's vireo (*Vireo bellii pusillus*) were heard singing along the channel during the field survey.

Site 4 – Western Hills Golf Course: This site is largely developed and supports predominantly non-native ornamental vegetation. However, there are also scattered native trees such as coast live oak, southern California black walnut, and arroyo willow. The site contains a small channel that bisects the maintained grass but supports few wetland species. Small areas of undeveloped slopes support remnants of native habitat with coast live oak, southern California black walnut, mule-fat (*Baccharis salicifolia*), and toyon (*Heteromeles arbutifolia*).

Site 5 – Wang (High Density): The site supports agriculture and walnut woodland. Domestic cows were observed grazing on-site, supporting the designation of agriculture instead of annual grassland. The non-native grasses that dominate much of the site consist of ripgut brome (*Bromus diandrus*) and oats (*Avena* spp.). Native species were scattered throughout the site, including fiddleneck (*Amsinckia* sp.), doveweed (*Croton setiger*), and pine-bush (*Ericameria pinifolia*).

Site 6 – The Shoppes: The site is entirely developed and supports ornamental species. No native habitat remains.

Site 7 – The Commons: The site is mostly developed and supports ornamental species. No native habitat remains.

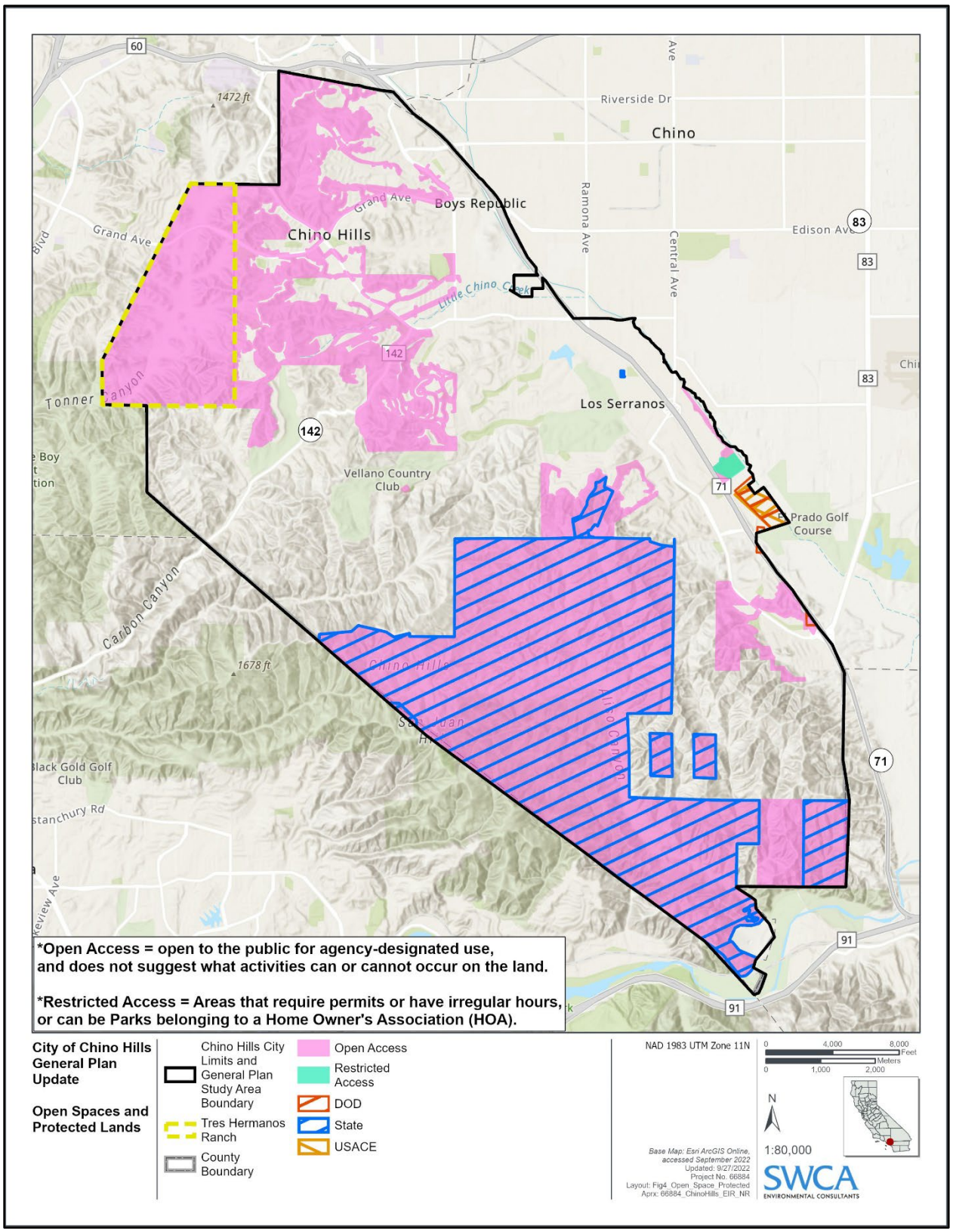


Figure 3. Open space and protected lands.

Site 8 – Canyon Estates (Medium Density): This site was evaluated by desktop only and supports annual grassland and a blueline stream.[1]

Site 9 – Wang (Medium Density): The site was evaluated by desktop only and supports agriculture. This is mapped as agriculture because the cows observed at Site 5 also have access to this site.

Site 10 – Canyon Estates (Low Density): The site was evaluated by desktop only. The site supports agriculture and walnut woodland. This site is dominated by disturbed/ruderal lands dominate, possibly previously grazed. A dense woodland occupies the north- and southwest portion of the site, along Old Woodview Road. The NWI maps this area are Freshwater Forested/Shrub Wetland, with several smaller channels draining into the main branch. These are mapped as intermittent Riverine Streambed. Review of aerial photos identified dense stands of gum trees (*Eucalyptus sp.*). Numerous walnut (*Juglans sp.*) trees and a few willows (*Salix sp.*) are present. Although positive identification cannot be made from an aerial photo, the walnuts appear to be Southern California Black Walnut (*J. californica*).

Site 11 – Los Serranos Golf Course (Low Density): The site was evaluated by desktop only. This site is entirely within the existing golf course and as such is dominated by manicured lawn (fairway) and scattered mature landscape trees (e.g., gums, pines, peppers) with little to no understory. Native plants are not expected to occur on this site and surface water resources are absent. Wildlife movement across the golf course (intra-site) is unrestricted; however, fencing is present adjacent to the western side of this site along Pipeline Avenue which would limit inter-site movement.

Undeveloped open space is present contiguous to the western side of this site, west of the paved cart path. The area appears to be disturbed/ruderal with few trees, likely the result of regular mowing and/or discing for fire safety fuel modification. A pond is present approximately 25 feet west of the western border of this site. The U.S. Fish and Wildlife Service on-line National Wetlands Inventory (NWI) identifies this site as a freshwater pond, which drains to the west and southwest into an intermittent riverine streambed.[2]

7.3 Sensitive Biological Resources

Sensitive biological resources occurring within the study area are discussed below.

7.3.1 Land Cover Categories and Sensitive Natural Communities

Sensitive or special-status communities are vegetation types, associations, or sub-associations with a Global or State Rank of 3 or lower; additionally riparian communities are always considered sensitive. A CNDDB query identified 14 land cover categories and sensitive natural communities that occur within the study area (Table 1, Figure 4). Of the communities identified within the study area, four sensitive habitats have CNDDB records within the city limits. These habitats include California Walnut Woodland, Southern California Arroyo Chub/Santa Ana Sucker Stream, Southern Sycamore Alder Riparian Woodland, and Southern Willow Scrub. Most of these natural communities are described under the Holland classification (Holland 1986, Holland 1992).

[1] A creek, stream or watercourse indicated by a solid or broken blue line on a U.S. Geologic Survey 7.5 minute series quadrangle map, sometimes a regulated aquatic resource.
[2] USFWS on-line Wetlands Mapper available at https://www.fws.gov/program/national-wetlands-inventory/wetlands-mapper.

Table 1. Natural Communities and Land Cover Categories in the Study Area

Natural Community/Land Cover	Acres
Agriculture	184
Annual Grassland/Ruderal	7762
California Walnut Woodland	288
Chaparral	734
Coastal Sage Scrub	1646
Coastal Sage Scrub/Chaparral	104
Disturbed/Developed	9109
Freshwater Emergent Wetland	70
Oak Woodland	766
Open Water	36
Riparian Oak Woodland	180
Riverine	155
Southern Sycamore Alder Riparian Woodland	40
Southern Willow Scrub	411

7.3.1.1 ANNUAL GRASSLAND

Annual grassland is dominated by non-native annual grasses and typically consist of species such as wild oat (*Avena fatua*) and ripgut brome. Other common non-native species observed in this habitat include black mustard (*Brassica nigra*), tocalote (*Centaurea melitensis*), and radish (*Raphanus sativus*).

7.3.1.2 CALIFORNIA WALNUT WOODLAND

California Walnut Woodland is an open woodland found in relatively moist, fine-textured soils of valley slopes and bottoms, and often surround rocky outcrops. This community is dominated by southern California black walnut with an open canopy that allows for the growth of a grassy understory. The understory typically consists of non-native winter-active annuals that complete their growth cycle before the leafy canopy emerges in spring. Other species associated with this community include sugar bush (*Rhus ovata*), coast live oak, Engelmann oak (*Quercus engelmannii*), and fragrant sumac (*Rhus aromatica*).

7.3.1.3 CHAPARRAL

Chaparral is typified by broadleaved evergreen shrubs with sclerophyllous leaves. These shrubs are medium to tall and form a dense cover on steep slopes. The herb layer is often poorly developed but contains abundant leaf litter. Dominant species of this habitat include toyon, laurel sumac (*Malosma laurina*), scrub oak, and lemonade berry (*Rhus integrifolia*).

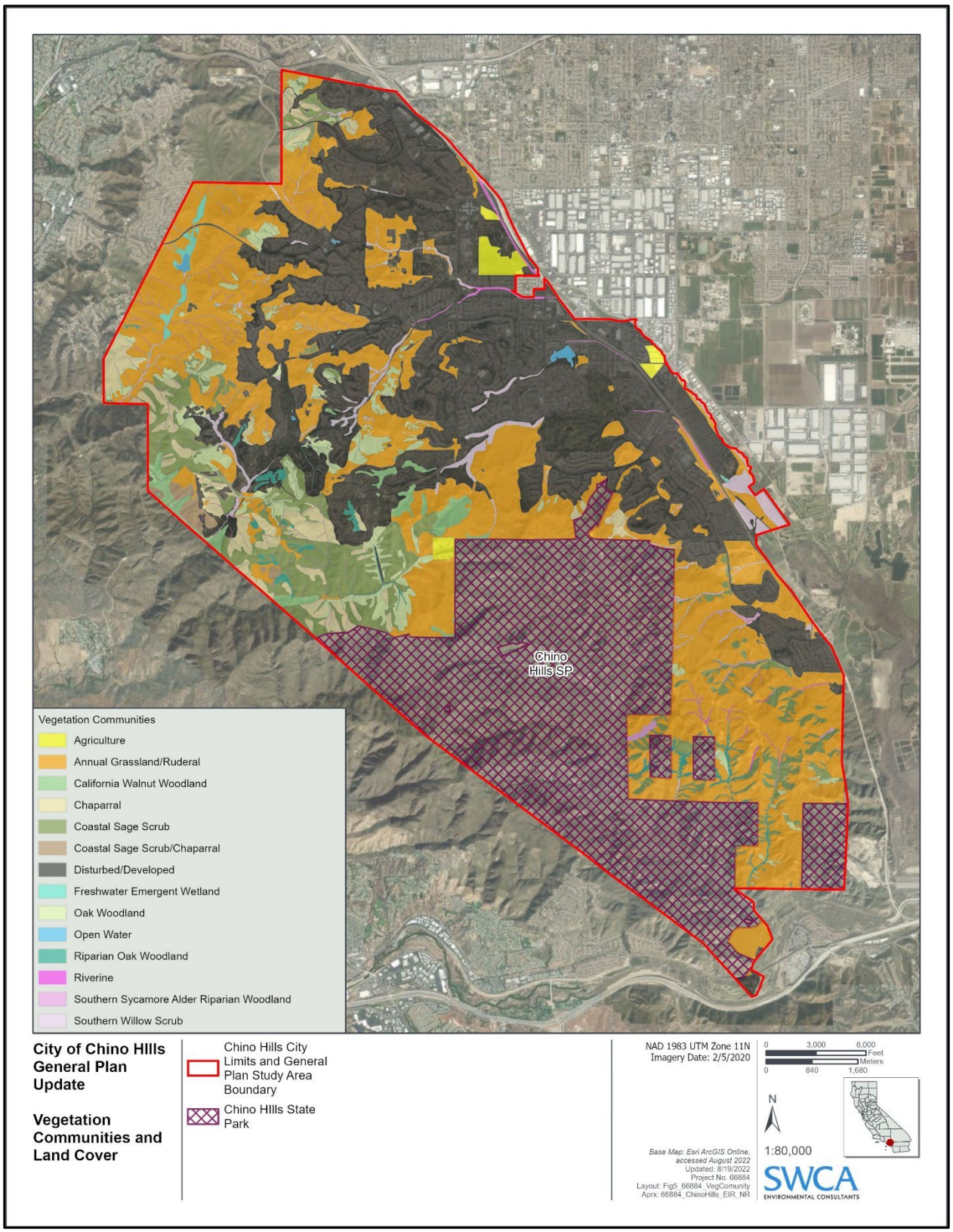


Figure 4. Vegetation communities and land cover.

7.3.1.4 COASTAL SAGE SCRUB

Coastal sage scrub consists of drought-deciduous shrubs and subshrubs with soft leaves and is typically found on slopes below 3,000 feet. Dominant species consists of coastal sagebrush (*Artemisia californica*) and California buckwheat (*Eriogonum fasciculatum*), and other typical species include coyote brush (*Baccharis pilularis*), white sage (*Salvia apiana*), and goldenbush (*Isocoma menziesii*).

7.3.1.5 COASTAL SAGE SCRUB/CHAPARRAL

This ecotonal habitat consists of intermixed chaparral and coastal sage scrub, forming a mosaic of species characteristic of each habitat.

7.3.1.6 DISTURBED AND DEVELOPED

Disturbed and developed land has been subject to anthropogenic disturbance in varying degrees. Disturbed land maintains a soil surface, but often consists of largely bare ground and offers no habitat value except for species highly adapted to disturbance. Developed land includes areas covered in pavement and structures, as well as associated landscaped areas maintained with irrigation. Developed land has no value except for common urban-adapted species.

7.3.1.7 FRESHWATER EMERGENT WETLAND

Freshwater emergent wetland includes freshwater marsh and seep communities. This habitat is typically located within channel bottoms with at least intermittent flow and are often dominated by emergent species such as cattail, bulrush (*Scirpus* spp.), rushes (*Juncus* spp.), and spike rushes (*Eleocharis* spp.).

7.3.1.8 COAST LIVE OAK WOODLAND

Coast live oak woodland is dominated by coast live oak and includes a sparse to moderately dense shrub layer that typically includes toyon, gooseberry (*Ribes* spp.), and blue elderberry (*Sambucus nigra ssp. caerulea*).

7.3.1.9 OPEN WATER

Open water includes ponds and other bodies of water without emergent vegetation. These areas are further discussed in Section 7.3.4, *Aquatic Resources*.

7.3.1.10 SOUTHERN COAST LIVE OAK RIPARIAN FOREST

Southern coast live oak riparian forest is found in the canyons and valleys of coastal southern California. This community is a dense evergreen woodland dominated by coast live oak. It occurs along large streams in outer floodplains and bottomlands on rich, fine-grained alluvium. Southern coast live oak riparian forest typically has a closed, or nearly closed, canopy with an understory that rich in herbs, but poor in understory shrubs. Species typically associated with this community include bigleaf maple (*Acer macrophyllum*), Douglas' sagewort (*Artemisia douglasiana*), milkmaids (*Cardamine californica*), spotted hideseed (*Eucrypta chrysanthemifolia*), toyon, heartleaf keckiella (*Keckiella cordifolia*), pink honeysuckle (*Lonicera hispidula*), Cucamonga manroot (*Marah macrocarpus*), blue fiesta flower (*Pholistoma auritum*), fragrant sumac, California wild rose (*Rosa californica*), California blackberry (*Rubus ursinus*), blue elderberry (*Sambucus nigra ssp. caerulea*), snowberry (*Symphoricarpos mollis*), poison oak (*Toxicodendron diversilobum*), and California laurel (*Umbellularia californica*).

7.3.1.11 RIVERINE

Riverine habitat consists of unvegetated ephemeral, intermittent, or perennial stream channels. These areas, including riparian corridors associated with aquatic resources, are further discussed in Section 7.3.4, *Aquatic Resources*.

7.3.1.12 SOUTHERN SYCAMORE-ALDER RIPARIAN WOODLAND

Southern sycamore-alder riparian woodland is a tall, open, broad-leaved, winter-deciduous woodland that is dominated by western sycamore and white alder (*Alnus rhombifolia*), which are often codominant or sub-codominant. White alder favors perennial stream systems, while western sycamore favors more intermittent flooding regime. These stands rarely form closed canopy forests, and often contain a dense understory of hard drought-resistant evergreens and deciduous species. Other species associated with southern sycamore-alder riparian woodland include bigleaf maple, Douglas' sagewort, California spikenard (*Aralia californica*), scouring rush horsetail (*Equisetum hyemale*), smilo grass (*Stipa miliacea*), coast live oak, California blackberry, blue elderberry, poison oak, California laurel, and stinging nettle (*Urtica dioica*).

7.3.1.13 SOUTHERN WILLOW SCRUB

Southern willow scrub is characterized by broad-leafed, winter deciduous riparian thickets that grow in loose, sandy, or fine gravelly alluvium deposited near stream channels during flood flows. This community is dominated by several willow species (*Salix* spp.), with scattered emergent Fremont cottonwood (*Populus fremontii*) and western sycamore. Stands of this community are typically dense, which limits the understory growth. This community requires repeated flooding events to prevent succession to the Southern Cottonwood-Sycamore Riparian Forest community. Species associated with this community include narrowleaf willow (*Salix exigua*), black willow, red willow (*Salix laevigata*), and arroyo willow.

7.3.2 Critical Habitat

The USFWS designates critical habitat for listed endangered or threatened species of flora and fauna. Critical habitat is defined in the federal ESA as habitat deemed essential to the survival of a federally listed species. One plant and four wildlife species that have been designated as federally endangered (FE) or federally threatened (FT) have designated critical habitat areas in the vicinity of the study area (Figure 5). Critical habitat for these five species has been designated within or adjacent to the City:

- Braunton's milk-vetch (*Astragalus brauntonii;* FE)
- Santa Ana sucker (*Catostomus santaanae*; FT)
- coastal California gnatcatcher (*Polioptila californica*; FT)
- southwestern willow flycatcher (*Empidonax traillii extimus;* FE, State Endangered [SE])
- least Bell's vireo (FE; SE)

Braunton's milk-vetch critical habitat occurs south of the southernmost tip of the city across the Santa Ana River. The Santa Ana River is listed as Santa Ana sucker critical habitat. The coastal California gnatcatcher critical habitat area occurs along the southwestern edge of the city within Chino Hills State Park. Critical habitat for the southwestern willow flycatcher occurs just east of the city limits along Chino Creek. Least Bell's vireo critical habitat occurs along the central eastern edge of the city, east of Chino Valley Freeway (California State Route [SR]-71). There is no other designated critical habitat in the city.

7.3.3 Special-Status Species

The CDFW defines special animals, plants and communities as those where at least one of the following conditions applies (CDFW 2022b):

- officially listed or proposed for listing under the state and/or federal ESAs;
- considered by the CDFW to be a species of special concern (SSC);
- listed by the CNPS with a CRPR;
- included on other lists, such as Riverside County;
- taxa which meet the criteria for listing, even if not currently included on any list, as described in Section 15380 of the CEQA Guidelines;
- taxa that are biologically rare, very restricted in distribution, or declining throughout their range but not currently threatened with extirpation;
- population(s) in California that may be peripheral to the major portion of a taxon's range but are threatened with extirpation in California;
- taxa closely associated with a habitat that is declining in California at a significant rate (e.g. wetlands, riparian, vernal pools, old growth forests, desert aquatic systems, native grasslands, valley shrubland habitats, etc.); or
- taxa designated as a special status, sensitive, or declining species by other state or federal agencies, or a non-governmental organization and determined by the state to be rare, restricted, declining, or threatened across their range in California.

7.3.3.1 SPECIAL-STATUS PLANTS

A review of CNDDB and the CNPS Rare Plant Inventory identified species that may occur in the study area. Thirty-five special-status species have CNDDB records within the study area (Figure 6, Appendix A).

7.3.3.2 SPECIAL-STATUS WILDLIFE

A review of CNDDB identified species that may occur in the city. Fifty-one special-status wildlife species have CNDDB records that occur within the study area (Figure 7, Appendix B). Some of the special-status species described below, such as the special-status fish, western ridged mussel (*Gonidea angulata*), and western pond turtle (*Emys marmorata*) require permanent sources of water or specific vegetation community composition to be considered habitat. Due to the size and diversity of the city, field surveys are recommended to determine if any of these species have any potential to occur; it should be assumed that these species have at least a low potential to occur within some areas of the city.

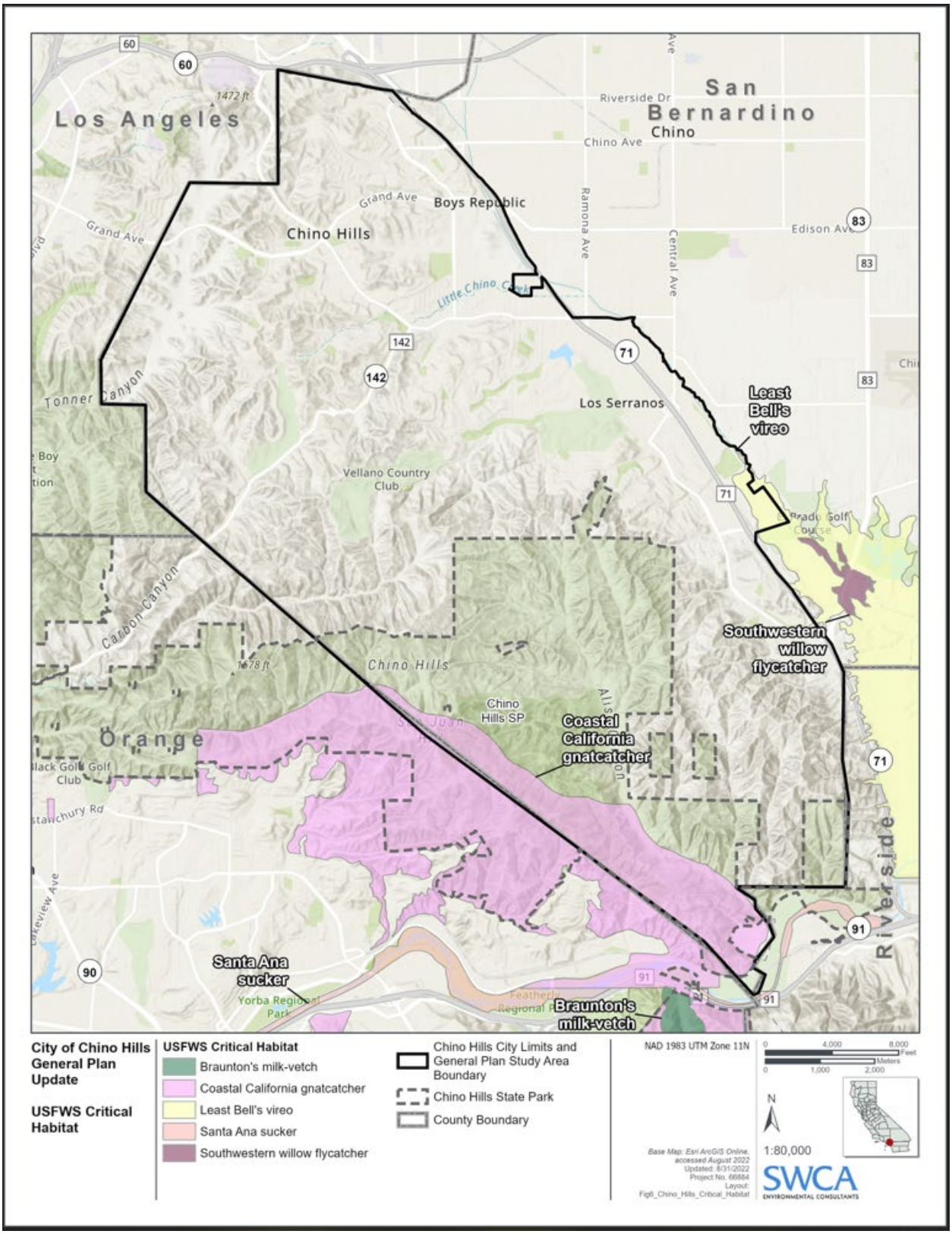


Figure 5. Designated critical habitat.

7.3.4 Aquatic Resources

The city is located within the Santa Ana and San Gabriel watersheds and within the Upper Chino, Middle Chino Creek, Lower Chino, Brea Creek-Coyote Creek, Carbon Creek, Walnut Canyon-Santa Ana River, and Alios Creek-Santa Ana River sub-watersheds. The city's watershed comprises a system of drainages and reservoirs that generally drain east and south, toward Chino Creek and Prado Flood Control Basin, and on to the Santa Ana River. Artificial ponds and lakes are also present throughout the city, with variable amounts of associated natural habitat. Canyons on the west side of the city, including Tonner Canyon, Carbon Canyon, Soquel Canyon, and Aliso Canyon, drain westward toward Los Angeles and Orange Counties. With the exception of Tonner Canyon, which drains into the San Gabriel River watershed, the remaining canyons drain into the lower reaches of the Santa Ana River Basin. Urban runoff from the city can pollute the natural watersheds of the Santa Ana River and San Gabriel River Basins.

7.3.4.1 DRAINAGES

Major creeks present within the city limits include Little Chino Creek and Chino Creek. Little Chino Creek is located within the northern portion of the city and flows eastward, crossing SR-71 before eventually discharging into San Antonio Channel. Chino Creek traverses the easterly boundary of the city and travels south before connecting with the Santa Ana River. There are a number of unnamed drainages that flow throughout the city, some of which include associated riparian corridors. Intermittent and perennial drainage systems that support substantial amounts of riparian vegetation may provide habitat for a range of wildlife, including small mammals, amphibians, and birds.

In addition, the City's 2015 General Plan Final Program EIR (City of Chino Hills 2015b) describes several storm drainage systems located throughout the city within the following drainage basins: Puente Hills, Boys Republic, English Channel, Little Chino Creek, Los Serranos Lake, Lower Los Serranos, Slaughter Canyon, Aliso Canyon, Southeast Chino Hills, Tonner Canyon, Carbon Canyon, and Soquel Canyon. Any City-owned drainage facilities within these basins are managed systems, although small amounts of associated vegetation may be present seasonally. Runoff from some of these systems drain into Chino Creek, Little Chino Creek, the Prado Flood Control Basin, and Prado Dam.

7.3.4.2 ARTIFICIAL LAKES

Artificial (created) lakes, ponds, and reservoirs are present throughout the city. The major reservoirs within the city include Los Serranos Lake and Arnold Reservoir. Los Serranos Lake is located within the Los Serranos area and is surrounded by residential development to the north and is fed by a drainage system to the west. Arnold Reservoir is located behind Chino Ranch within Tonner Canyon and is fed by drainage systems to the north and west. Both lakes serve as open water areas, and any associated riparian vegetation and corridors provide cover and foraging habitat for wildlife. Additional artificial ponds throughout the city include those associated with City parks and golf courses.

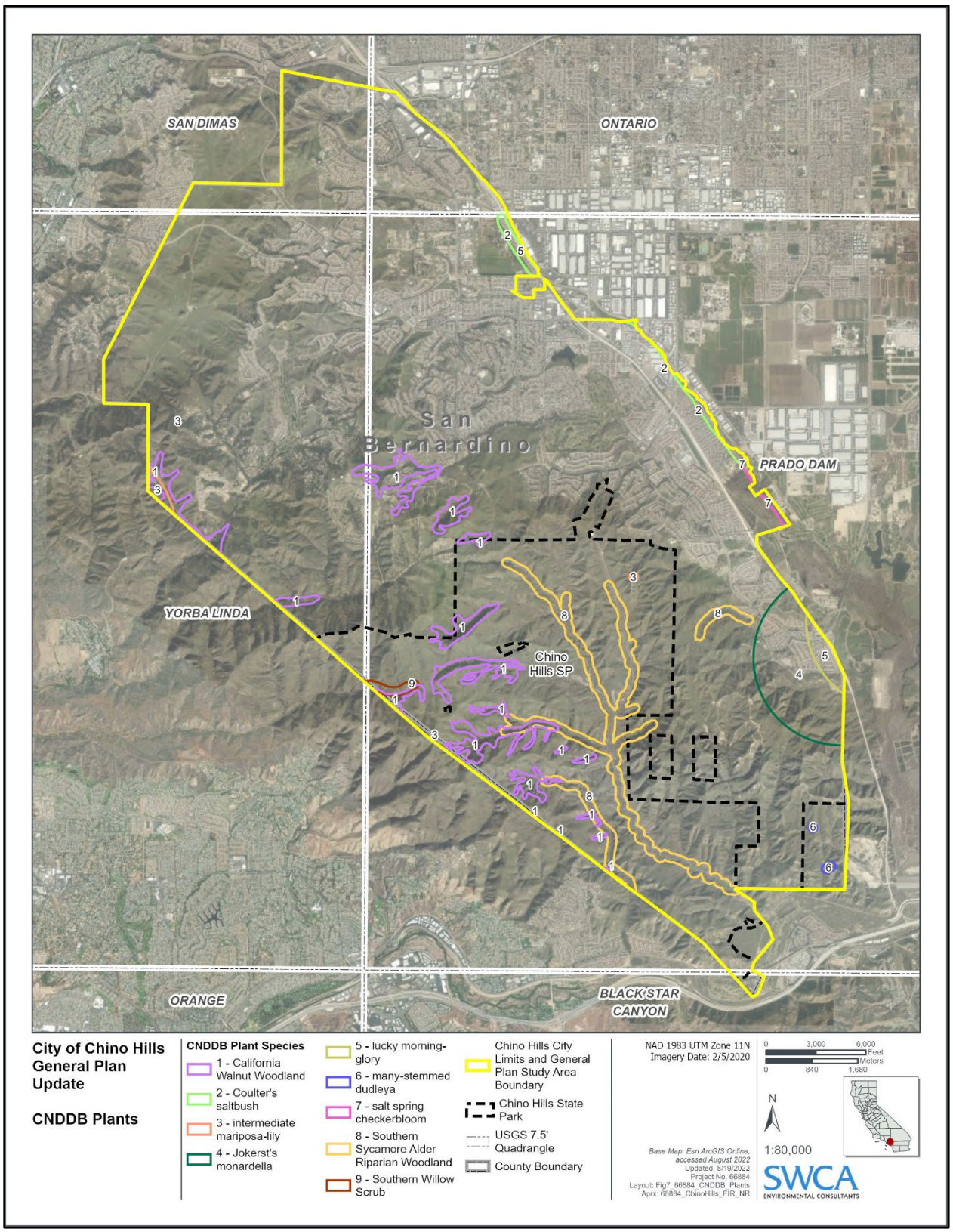


Figure 6. CNDDB plant records.

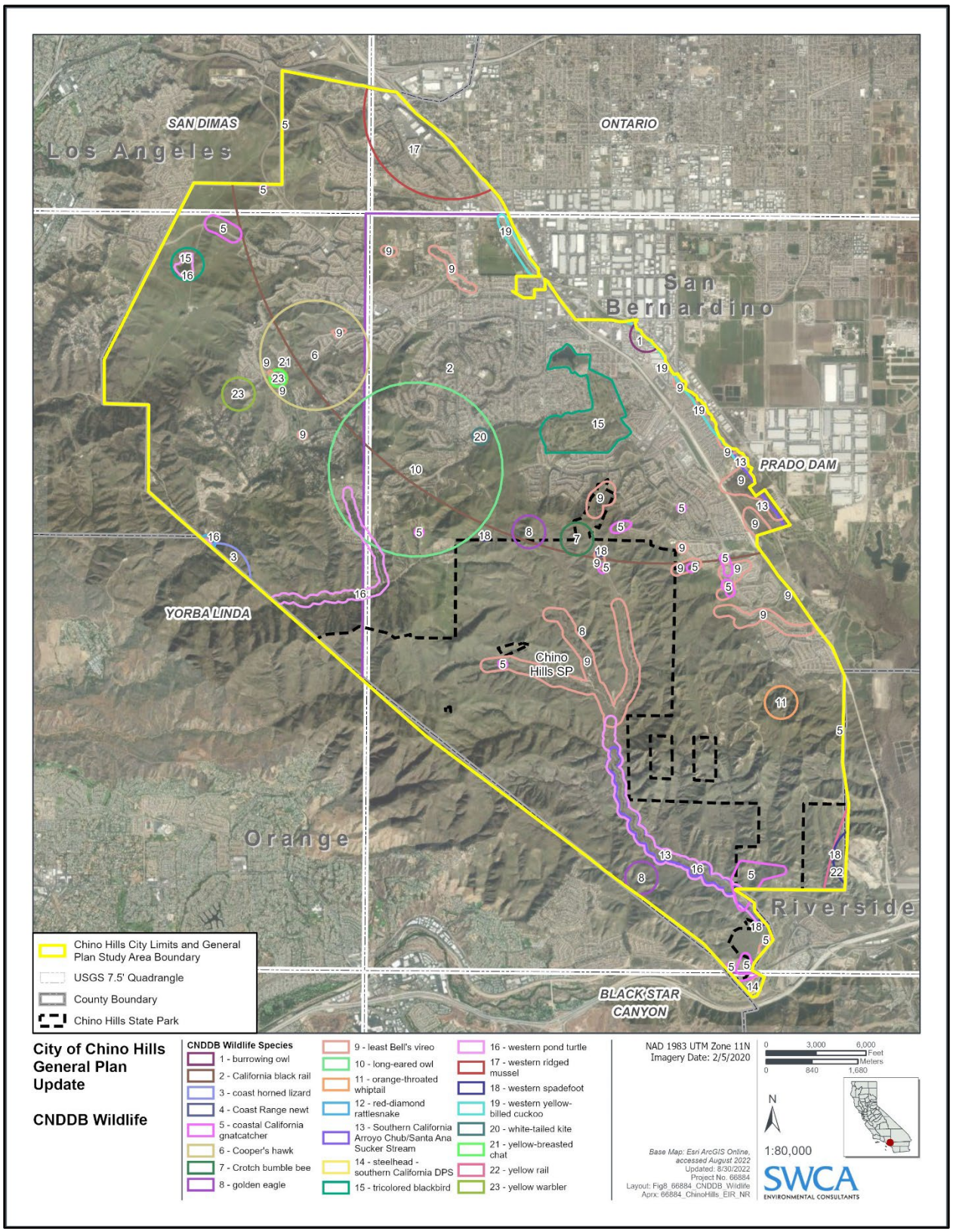


Figure 7. CNDDB wildlife records.

7.3.5 Vegetation

Vegetation within the city broadly includes grassland, woodland, chaparral, coastal sage scrub, riparian woodland, riparian scrub, freshwater wetland, and aquatic resources (i.e., open water and riverine). Most of the vegetation within the city is grassland. In the western portion of the city chaparral and coastal sage scrub habitats are present as well as stretches of oak woodland. California walnut woodland is also present in the western and central region of the city to a lesser extent. Riparian woodland, riparian scrub, freshwater wetland, and aquatic resources are found in and along topographically low places throughout the western and southern portions of the city. Much of the eastern and northern areas of the city are developed and no longer contain natural habitats. Vegetation observed on the RHNA sites during the July 13 and 14, 2022 site visits is described below.

Site 1 – The Shoppes II: During the site visits, it was observed that this site supports annual grassland and developed land. Ruderal species such as short-pod mustard and Russian thistle were observed during the site visit. Grasses had been recently mowed and were not identifiable beyond being annual non-native grasses.

Site 2 – Community Park Overflow: This site is graded and only supports disturbed and developed land. Common ruderal species such as horseweed and puncture vine were observed during the site visit where there was a soil surface. One small *Eucalyptus* tree was also observed.

Site 3 – Los Serranos Golf Course: This site is largely developed with non-native ornamental vegetation. However, the site includes an incised channel that supports disturbed southern riparian scrub co-dominated by black willow and arroyo willow along with non-native trees such as Mexican fan palm and edible fig. The understory largely comprises non-native species such as castor bean, umbrella plant, and small tamarisk individuals, but did include cattail along the margins of the channel. Other plant species observed include eucalyptus, Shamel ash (*Fraxinus uhdei*), buffalo gourd (*Cucurbita foetidissima*), Italian thistle (*Carduus pycnocephalus*), western ragweed (*Ambrosia psilostachya*), tree tobacco (*Nicotiana glauca*), Peruvian pepper tree (*Schinus molle*), western jimsonweed (*Datura wrightii*), pecan (*Carya illinoinensis*), horehound (*Marrubium vulgare*), white alder, and tall flatsedge (*Cyperus eragrostis*).

Site 4 – Western Hills Golf Course: This site is largely developed and supports predominantly non-native ornamental vegetation. However, there are also scattered native trees such as coast live oak, southern California black walnut, and arroyo willow. The site contains a small channel that bisects the maintained grass but supports few wetland species. Small areas of undeveloped slopes support remnants of native habitat with coast live oak, southern California black walnut, mule-fat, and toyon. Other plant species observed include southern magnolia (*Magnolia grandiflora*), Italian cypress (*Cupressus sempervirens*), blue jacaranda (*Jacaranda mimosifolia*), and Chinese elm (*Ulmus parvifolia*).

Site 5 – Wang (High Density): The site supports agriculture and walnut woodland. Domestic cows were observed grazing onsite, supporting the designation of agriculture instead of annual grassland. The non-native grasses that dominate much of the site consist of ripgut brome and oats. Native species were scattered throughout the site, including fiddleneck, doveweed, and pine-bush.

Site 6 – The Shoppes: The site is entirely developed and supports ornamental species. No native habitat remains.

Site 7 – The Commons: The site is entirely developed and supports ornamental species. No native habitat remains.

Site 8 – Canyon Estates (Medium Density): This site was evaluated by desktop only and supports annual grassland and a blueline stream. Plant species occurring on this site would be expected to be similar to Sites 1 and 5.

Site 9 – Wang (Medium Density): The site was evaluated by desktop only and supports agriculture. Plant species occurring on this site would be expected to be similar to Sites 1 and 5, but perhaps with lower diversity due to grazing.

Site 10 – Canyon Estates (Low Density): The site was evaluated by desktop only. The site supports agriculture and walnut woodland. This site is dominated by disturbed/ruderal lands dominate, possibly previously grazed. A dense woodland occupies the north- and southwest portion of the site, along Old Woodview Road. The NWI maps this area are Freshwater Forested/Shrub Wetland, with several smaller channels draining into the main branch. These are mapped as intermittent Riverine Streambed. Review of aerial photos identified dense stands of gum trees (*Eucalyptus sp.*). Numerous walnut (*Juglans sp.*) trees and a few willows (*Salix sp.*) are present. Although positive identification cannot be made from an aerial photo, the walnuts appear to be Southern California Black Walnut (*J. californica*).

Site 11 – Los Serranos Golf Course (Low Density): The site was evaluated by desktop only. This site is entirely within the existing golf course and as such is dominated by manicured lawn (fairway) and scattered mature landscape trees (e.g., gums, pines, peppers) with little to no understory. Native plants are not expected to occur on this site and surface water resources are absent. Wildlife movement across the golf course (intra-site) is unrestricted; however, fencing is present adjacent to the western side of this site along Pipeline Avenue which would limit inter-site movement.

Undeveloped open space is present contiguous to the western side of this site, west of the paved cart path. The area appears to be disturbed/ruderal with few trees, likely the result of regular mowing and/or discing for fire safety fuel modification. A pond is present approximately 25 feet west of the western border of this site. The U.S. Fish and Wildlife Service on-line National Wetlands Inventory (NWI) identifies this site as a freshwater pond, which drains to the west and southwest into an intermittent riverine streambed.[3]

7.3.6 Wildlife

Open spaces areas within the built environment of the city provide refugia for some wildlife species, particularly birds and small animals such as lizards and butterflies. The southern and western regions of the city with connectivity to Chino Hills State Park have the potential to support larger wildlife such as mule deer (*Odocoileus hemionus*). Golf courses and parks typically have mature trees and water features, both important elements providing food and cover for wildlife. Orchards and other forms of agricultural land uses may also offer some habitat value. Wildlife species detected at the RHNA sites are described below.

Site 1 – The Shoppes II: This site supports annual grassland and developed land. Wildlife observed include American crow (*Corvus brachyrhynchos*), common raven (*Corvus corax*), lesser goldfinch (*Spinus psaltria*), and California ground squirrel (*Otospermophilus beecheyi*).

Site 2 – Community Park Overflow: This site is graded and only supports disturbed and developed land. No wildlife was observed on-site.

[3] USFWS on-line Wetlands Mapper available at https://www.fws.gov/program/national-wetlands-inventory/wetlands-mapper.

Site 3 – Los Serranos Golf Course: This site is largely developed with non-native ornamental vegetation. However, the site includes an incised channel that supports disturbed southern riparian scrub. Two male least Bell's vireos were heard singing along the channel during the field survey. Other wildlife detected on-site include Canadian goose (*Branta canadensis*), red-shouldered hawk (*Buteo lineatus*), Anna's hummingbird (*Calypte anna*), house finch (*Haemorhous mexicanus*), acorn woodpecker (*Melanerpes formicivorus*), cliff swallow (*Petrochelidon pyrrhonota*), bushtit (*Psaltriparus minimus*), black phoebe (*Sayornis nigricans*), lesser goldfinch, Cassin's kingbird (*Tyrannus vociferans*), Bewick's wren (*Thryomanes bewickii*), mourning dove (*Zenaida macroura*), California ground squirrel, monarch butterfly, mourning cloak (*Nymphalis antiopa*), and western tiger swallowtail (*Papilio rutulus*).

Site 4 – Western Hills Golf Course: This site is largely developed and supports predominantly non-native ornamental vegetation. However, there are also scattered native trees. The site contains a small channel that bisects the maintained grass but supports few wetland species. Small areas of undeveloped slopes support remnants of native habitat. Wildlife species detected on-site include red-shouldered hawk, Anna's hummingbird, house finch, black phoebe, Bewick's wren, and Cassin's kingbird.

Site 5 – Wang (High Density): The site supports agriculture and walnut woodland. Wildlife species detected on-site include red-shouldered hawk, Anna's hummingbird, common raven, house finch, hooded oriole (*Icterus cucullatus*), cliff swallow, Cassin's kingbird, domestic cow, and tarantula hawk wasp (*Pepsis* sp.).

Site 6 – The Shoppes: The site is entirely developed and supports ornamental species. No native habitat remains. Wildlife species detected on-site include red-shouldered hawk, killdeer (*Charadrius vociferus*), American crow, common raven, and house finch.

Site 7 – The Commons: The site is entirely developed and supports ornamental species. No native habitat remains. Wildlife species detected on-site consist of turkey vulture (*Cathartes aura*), American crow, house finch, northern mockingbird (*Mimus polyglottos*), and mourning dove.

Site 8 – Canyon Estates (Medium Density): This site was evaluated by desktop only and supports annual grassland and a blueline stream. Wildlife would be expected to be similar to Sites 1 and 5, and would likely include typical animals found in grasslands such as raptors, passerines, small mammals, snakes, lizards, and arthropods.

Site 9 – Wang (Medium Density): The site was evaluated by desktop only and supports agriculture. This is mapped as agriculture because the cows observed at Site 5 also have access to this site. Wildlife would be expected to be similar to Sites 1 and 5, but perhaps with less diversity due to grazing.

Site 10 – Canyon Estates (Low Density): The site was evaluated by desktop only. The site supports agriculture and walnut woodland. A dense woodland occupies the north- and southwest portion of the site, along Old Woodview Road. Wildlife using this site would be expected to be similar to Sites 1, 5, and 8 with the addition of species found in riparian habitats; species would likely include raptors, passerines, small mammals, snakes, lizards, and arthropods.

Site 11 – Los Serranos Golf Course (Low Density): The site was evaluated by desktop only. This site is entirely within the existing golf course and as such is dominated by manicured lawn (fairway) and scattered mature landscape trees (e.g., gums, pines, peppers) with little to no understory. Wildlife using this site would be expected to be similar to Sites 1, 5, 8 and 10; species would likely include raptors, passerines, small mammals, snakes, lizards, and arthropods.

7.3.7 Wildlife Movement and Migratory Corridors

There are large areas of open space within and adjacent to the city boundaries, including the Chino Hills State Park located within the southwest portion of the city, Puente Hills to the west, Prado Regional Park to the east, the Santa Ana Mountains and Cleveland National Forest to the south, and the San Gabriel Mountains and Angeles National Forest to the north.

Together, the Santa Ana Mountains and the Puente-Chino Hills encompass approximately 511,000 acres of wildlands supporting natural resources of statewide significance. To preserve the long-term ecological health of this linkage, Chino Hills State Park and the Santa Ana Mountains were connected via a critical habitat linkage known as the Coal Canyon wildlife underpass at SR-91 (Penrod 2001). Portions of the study area fall within the Puente-Chino Hills Wildlife Corridor, which provides connectivity to Coal Canyon to the south, Puente Hills to the north, and the Prado Basin to the east. The mid-section of the corridor system, known as the "Missing Middle," stretches from Tonner Canyon within the city limits further west to Harbor Boulevard within Los Angeles County (Spencer 2005). The Puente-Chino Hills Wildlife Corridor has become fragmented by urban development, particularly within the mid-section of the system. Future development could further degrade or even sever wildlife movement within the corridor. Therefore, preserving connectivity is essential for sustaining genetic diversity and maintaining the long-term integrity of metapopulations. Furthermore, it provides inter-range travel opportunities for terrestrial vertebrates, habitat specialists, and seeds and other propagules that depend on wildlife for dispersal.

Additionally, there are areas of open space throughout the city limits that include various community parks. Areas such as orchards, parklands, and drainage systems may convey movement between open spaces and throughout surrounding development for a broader suite of wildlife species. Additionally, perennial streams flowing throughout the city, including Little Chino Creek, provide habitat for sensitive species such as the arroyo chub and least Bell's vireo.

There are no known migratory fish routes or wildlife nursery sites that support migratory bird routes within the city.

8 RECOMMENDED IMPACT AVOIDANCE AND MITIGATION MEASURES

This section provides general measures geared to avoid, reduce, or mitigate potential impacts resulting from build out under the City's General Plan.

8.1 Mitigation Measures Applying to Development Projects in the General Plan Study Area

The following measures should apply to all development projects within the General Plan study area. Depending on the City's approach to the General Plan policy documents and their accompanying CEQA environmental review, these measures could be incorporated as policies or implementation programs within the General Plan Update policy document itself or, alternatively, they could be incorporated as mitigation measures within the CEQA document on the General Plan Update.

Mitigation Measure GP-BR-1. Biological Resources. The following measures shall be required for all development projects within the city limits where biological resources are present or maybe impacted by development.

a. Applicants for future development projects should include a biological resources assessment to determine where biological resources are present or could be adversely impacted by individual project development. The biological resources survey shall be conducted by a qualified biologist and should include, but not be limited to:
    - A desktop analysis of available literature and biological databases, such as the CNDDB, to determine sensitive biological resources that have been reported historically from the vicinity of the proposed development project area;
    - A review of current and recent land uses within and in the vicinity of the proposed development project area;
    - An assessment of vegetation communities present on the proposed development project area, specifically to identify special-status habitats and land cover types with moderate to high potential to support special-status flora and/or fauna;
    - An evaluation of potential impacts to local and regional wildlife movement corridors; and
    - A general assessment of potential jurisdictional aquatic areas, including wetlands and riparian habitats.

b. If the proposed development site supports vegetation communities that may provide habitat for plant or wildlife species, a focused habitat assessment shall be conducted by a qualified biologist to determine the potential for special-status plant and/or animal species to occur within or adjacent to the proposed development project area.

c. If one or more special-status species has the potential to occur within the proposed development project area, focused species surveys shall be conducted to determine the presence/absence of these species to adequately evaluate potential direct and/or indirect impacts to these species.

d. If construction activities are not initiated immediately after focused surveys have been completed, additional pre-construction special-status species surveys may be required to ensure impacts are avoided or minimized to the extent feasible. If pre-construction activities are required, a qualified biologist would perform these surveys as required for each special-status species that is known to occur or has a potential to occur within or adjacent to the proposed development project area.

e. The results of the biological survey for proposed development projects with less than significant impacts may be presented in a biological survey letter report. For proposed development projects with significant impacts that require mitigation to reduce the impacts to below a level of significance, the results of the biological survey shall be presented in a biological technical report.

f. If special-status biological resources are identified within or adjacent to the proposed development project area, the construction limits shall be clearly flagged to ensure impacts to sensitive biological resources are avoided or minimized to the extent feasible. Prior to implementing construction activities, a qualified biologist shall verify that the flagging clearly delineates the construction limits and sensitive resources to be avoided.

g. If sensitive biological resources are known to occur within or adjacent to the proposed development project area, a project-specific worker environmental awareness training program shall be developed and implemented to educate project contractors on the sensitive biological resources within and adjacent to the proposed development project area and measures being implemented to avoid and/or minimize impacts to these species. A qualified biologist shall develop and implement the contractor training program.

h. If sensitive biological resources are present within or adjacent to the proposed development project area and impacts may occur from implementation of construction activities, a qualified biological monitor may be required during a portion or all of the construction activities to ensure impacts to the sensitive biological resources are avoided or minimized to the extent feasible. The specific biological monitoring requirements shall be evaluated on a project-by-project basis. The qualified biological monitor shall be approved by the City on a project-by-project basis based on applicable experience with the sensitive biological resources that may be impacted by the proposed development project activities.

i. For construction schedule to occur during the nesting bird season (generally February 1 to September 1), preconstruction nesting bird surveys shall be conducted by a qualified biologist within all suitable nesting habitat on the project site and a surrounding 300-foot buffer area for birds covered by the MBTA. The term 'construction' includes all ground-disturbing activity such as vegetation removal, trimming, mowing, equipment/vehicle movement/storage, etc. Pre-construction surveys shall be conducted no more than 3 days prior to initiation of construction. If no active bird nests are identified within the proposed development project area or a 300-foot buffer of the proposed development project area, no further mitigation is necessary. If active bird nests are detected within the proposed development project area or t buffer zone, construction shall be halted until the young have fledged (left the nest), no new nesting activity is witnessed, the nest determined to be inactive, or until appropriate mitigation measures that respond to the specific situation have been developed and implemented in consultation with the regulatory agencies. The monitoring buffer area may be reduced based on the judgement of a qualified biologist.

Mitigation Measure GP-BR-2. Jurisdictional Waters. Future development projects within the city limits could result in significant impacts to jurisdictional aquatic resources depending on the location, extent, and proposed development and activities associated with the future project(s). Protected jurisdictional aquatic resources include wetlands, streams, vernal pools and/or lakes. The following survey requirements and measures shall apply to future projects within the city limits to address potential impacts to jurisdictional areas.

a. If the proposed development project has the potential to affect jurisdictional resources, a qualified wetland scientist shall conduct a jurisdictional delineation following the methods outlined in the most current state and federal guidance. The extent of potentially regulated aquatic resources (wetlands and non-wetland waters) and limits of jurisdiction shall be mapped and described. Potential impacts to each type of aquatic resource shall be quantified.

b. If a proposed project would impact jurisdictional features, permits and authorizations may be required from the USACE, CDFW, and/or RWQCB. Appropriate project-specific avoidance and minimization measures shall be implemented to reduce impacts to jurisdictional resources to less-than-significant levels consistent with permitting agency guidance. Such mitigation for impacts to jurisdictional resources could include habitat creation, restoration, enhancement, or offsite compensatory mitigation.

8.2 Mitigation Measures for RHNA Sites

Because there is no current plan pending for the development for Sites 1, and 5-11, and because resources can and do change over time, site-specific studies should be performed only once the plan for development for the particular site is known and entitlements are sought. Engaging in speculative analysis at this early stage before a specific development proposal is brought forth would not further CEQA's underlying purposes and would not serve to ensure maximum protection of site-specific environmental resources. Having said, the results of the more detailed assessment of the RHNA sites

indicate that the following requirements should apply. Mitigation Measure RNHA-BR-1 applies to all sites, while Mitigation Measure RNHA-BR-2 only applies to the site noted within the measure.

Mitigation Measure RHNA-BR-1. Requirements to Avoid Impacts to Nesting Birds Protected Trees. The following measures apply to all eleven RHNA sites:

a. If vegetation trimming, vegetation removal, and/or ground-disturbing activities are proposed to occur during the nesting bird season (generally February 1 to September 1) preconstruction nesting bird surveys shall be conducted by a qualified biologist within all suitable nesting habitat on the project site and a surrounding 300-foot buffer area for birds covered by the MBTA. The term 'construction' shall include all ground-disturbing activities such as vegetation removal, trimming, mowing, equipment/vehicle movement/storage, etc. Pre-construction surveys shall be conducted no more than 3 days prior to initiation of construction. If no active bird nests are identified within the proposed development project area or a 300-foot buffer of the proposed development project area, no further mitigation is necessary. If active bird nests are detected within the proposed development project area or t buffer zone, construction shall be halted until the young have fledged (left the nest), no new nesting activity is witnessed, the nest determined to be inactive, or until appropriate mitigation measures that respond to the specific situation have been developed and implemented in consultation with the regulatory agencies. The monitoring buffer area may be reduced based on the judgement of a qualified biologist.

b. RHNA sites that contain trees shall be surveyed by a City-approved certified arborist to determine if trees proposed for removal or trimming are protected under the City's tree preservation ordinance (Municipal Code in Chapter 16.90). Appropriate preservation, mitigation, and replacement measures shall be implemented consistent with City code.

Mitigation Measure RHNA-BR-2. Additional Requirements for RHNA Sites with Potentially Significant Resource Potential. In addition to Mitigation Measure RHNA-BR-1, the following measures shall be implemented for each of the RHNA sites that have the potential to affect additional biological resources, as specified:

Site 1 – The Shoppes II: Impacts to biological resources within the grasslands at Site 1 could occur because the vegetation could potentially support special-status species that inhabit or forage within grasslands (e.g., burrowing owls [*Athene cunicularia*] and raptors). Impacts to developed land would not be significant. Prior to site development, formal surveys are required to determine the presence of protected and/or special-status species and habitats to determine potential impacts and to formulate appropriate measures to mitigate any potentially significant impacts identified.

Site 3 – Los Serranos Golf Course: Impacts to developed land would not be significant. Impacts to potential jurisdictional aquatic resources could be significant. Prior to site development, formal surveys are required to determine the presence of least Bell's vireo, southern riparian scrub and other protected and/or special-status species and habitats to determine potential impacts and formulate appropriate mitigation measures, if necessary. An aquatic resource determination (wetland delineation) is required to determine potential impacts to regulated aquatic resources and to formulate appropriate measures, if necessary.

Site 4 – Western Hills Golf Course: Impacts to developed land would not be significant. Impacts to potential jurisdictional aquatic resources could be significant. Prior to site development, formal surveys would be required to determine the presence of protected and/or special-status species and habitats to determine potential impacts and formulate appropriate mitigation measures, if necessary. An aquatic resource determination (wetland delineation) would be required to determine potential impacts to regulated aquatic resources and to formulate appropriate mitigation measures, if necessary.

Site 5 – Wang (High Density): Impacts to agriculture could be significant as the site closely resembles annual grassland (except the presence of cattle) and could potentially support special-status species that inhabit or forage within grasslands (e.g., raptors). Impacts to walnut woodland could be significant. Prior to site development, formal surveys are required to determine the presence protected and/or special-status species and habitats to determine potential impacts and formulate appropriate mitigation measures. An aquatic resource determination (wetland delineation) could be required to determine impacts to regulated aquatic resources and formulate appropriate mitigation measures, if necessary.

Site 8 – Canyon Estates (Medium Density): Impacts to annual grassland could be significant. Impacts to potential jurisdictional aquatic resources could be significant. Prior to site development, formal surveys are required to determine the presence protected and/or special-status species and habitats to determine potential impacts and formulate appropriate mitigation measures. An aquatic resource determination (wetland delineation) could be required to determine impacts to regulated aquatic resources and formulate appropriate mitigation measures, if necessary.

Site 9 – Wang (Medium Density): Impacts to agriculture could be significant because this site closely resembles annual grassland (except the presence of cattle) and could potentially support special-status species that inhabit or forage within grasslands (e.g., raptors). Prior to site development, formal surveys are required to determine the presence of protected and/or special-status species and habitats to determine potential impacts and formulate appropriate mitigation measures. An aquatic resource determination (wetland delineation) could be required to determine impacts to regulated aquatic resources and formulate appropriate mitigation measures, if necessary.

Site 10 – Canyon Estates (Low Density): Impacts to annual grassland could be significant. Impacts to walnut woodland would be significant. Impacts to potential jurisdictional aquatic resources could be significant. Prior to site development, formal surveys are required to determine the presence of protected and/or special-status species and habitats to determine potential impacts and formulate appropriate mitigation measures. An aquatic resource determination (wetland delineation) could be required to determine impacts to regulated aquatic resources and formulate appropriate mitigation measures, if necessary.

Site 11 – Los Serranos Golf Course (Low Density): Impacts to developed land would not be significant. Special attention should be paid to the off-site pond during site-specific planning such that no direct or indirect impacts occur.

9 LITERATURE CITED

Baldwin, B.G., D.H. Goldman, D.J. Keil, R. Patterson, T.J. Rosatti, and D.H. Wilken (eds). 2012. *The Jepson Manual: Vascular Plants of California, Second Edition*. University of California Press, Berkeley.

Calflora. 2022. Calflora: A non-profit database providing information on wild California plants. Berkeley, California. Available: http://www.calflora.org/. Accessed July 2022.

California Department of Fish and Wildlife (CDFW 2015. *California State Wildlife Action Plan: A Conservation Legacy for Californians. 2015 Update: Volumes I and II*. Available at: https://wildlife.ca.gov/SWAP/Final. Accessed August 2022.

———. 2017. California Terrestrial and Vernal Pool Invertebrates of Conservation Priority. Available at: https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=149499&inline. Accessed August 2022.

———. 2022a. RAREFIND 5. Available at: https://www.wildlife.ca.gov/Data/CNDDB/Maps-and-Data. Accessed July 2022.

———. 2022b. Special Animals List. Available at: https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=109406&inline. Accessed July 2022.

———. 2022c. Special Vascular Plants, Bryophytes, and Lichens List. Available at: https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=109383&inline. Accessed July 2022.

———. 2022d. Metadata Description of CNDDB Fields. Available at: https://map.dfg.ca.gov/rarefind/view/RF_FieldDescriptions.htm. Accessed July 2022.

California Native Plant Society (CNPS). 2022a. CNPS Rare Plant Inventory. Available at: http://www.rareplants.cnps.org/. Accessed July 2022.

———. 2022b. Glossary of Terms and Field. Available at: http://www.rareplants.cnps.org/glossary.html. Accessed July 2022.

City of Chino Hills (City). 2015a. City of Chino Hills General Plan. Available at: https://www.chinohills.org/124/General-Plan. Accessed July 2022.

———. 2015b. *City of Chino Hills Final Program Environmental Impact Report*. General Plan Updated. Dated February 24, 2015.

———. 2022. Tree Preservation. Ordinance No. 16.90. City of Chino Hills Municipal Code. Adopted January 28, 2020. Available at: https://library.municode.com/ca/chino_hills/codes/code_of_ordinances?nodeId=TIT16DECO_CH16.90TRPR_16.90.040REPRTRPRWITRPE. Accessed July 2022.

Google Earth. 2022. Chino Hills, California. Available at: https://www.google.com/earth/. Accessed July 2022.

Holland, R.F. 1986. *Preliminary Descriptions of the Terrestrial Natural Communities of California*. California Department of Fish and Game, Sacramento.

———. 1992. *Update: Preliminary Descriptions of the Terrestrial Natural Communities of California*. California Department of Fish and Game, Sacramento.

Kimsey, L. 2014. *California Cuckoo Wasps in the Family Chrysididae (Hymenoptera)*. University of California Press. Berkeley, CA.

Noss, R.F., P. Beier, and W. Shaw. 1998. *Evaluation of the Coal Canyon Biological Corridor*. Report for the State of California Department of Parks and Recreation, Sacramento, CA.

Penrod, K., R. Hunter, and M. Marrifield. 2001. Missing Linkages: restoring connectivity to the California landscape. California Wilderness Coalition, The Nature Conservancy, U.S. Geological Survey, Center for Reproduction of Endangered Species, and California State Parks. Sacramento, CA.

Spencer, W.D. 2005. *Maintaining Ecological Connectivity Across the "Missing Middle" of the Puente-Chino Hills Wildlife Corridor*. Prepared for the Resources Legacy Fund Foundation. Conservation Biology Institute. Corvallis, OR.

United States Fish and Wildlife Service (USFWS). 2022. USFWS Threatened & Endangered Species Active Critical Habitat Report. Available at: https://ecos.fws.gov/ecp/report/table/critical-habitat.html. Accessed July 2022.

Weather Spark. 2022. Climate and Average Weather Year Round in Chino Hills. Available at: https://weatherspark.com/y/1834/Average-Weather-in-Chino-Hills-California-United-States-Year-Round. Accessed July 2022.

Xerces Society for Invertebrate Conservation. Available at: https://xerces.org/ Accessed August 2022.

APPENDIX A

Special-Status Plants

Table A.1. Special-Status Plants

Species Name	Habitat[1]	Status	CRPR
Abronia villosa var. *aurita* chaparral sand-verbena	Chaparral, coastal scrub, desert dunes. Sandy areas. 60-1,570 m.	-	1B.1
Allium marvinii Yucaipa onion	Openings in chaparral on clay soils. 850-1070 m.	-	1B.2
Astragalus brauntonii Braunton's milk-vetch	Chaparral, coastal scrub, valley and foothill grassland. Recent burns or disturbed areas; usually on sandstone with carbonate layers. Soil specialist; requires shallow soils to defeat pocket gophers and open areas, preferably on hilltops, saddles or bowls between hills. 3-640 m.	FE	1B.1
Atriplex coulteri Coulter's saltbush	Coastal bluff scrub, coastal dunes, coastal scrub, valley and foothill grassland. Ocean bluffs, ridgetops, as well as alkaline low places. Alkaline or clay soils. 2-460 m.	-	1B.2
Baccharis malibuensis Malibu baccharis	Coastal scrub, chaparral, cismontane woodland, riparian woodland. In Conejo volcanic substrates, often on exposed roadcuts. Sometimes occupies oak woodland habitat. 150-320 m.	-	1B.1
Berberis nevinii Nevin's barberry	Chaparral, cismontane woodland, coastal scurb, riparian scrub. On steep, north-facing slopes or in low grade sandy washes. 90-1,590 m.	FE, SE	1B.1
Calochortus plummerae Plummer's mariposa-lily	Coastal scrub, chaparral, valley and foothill grassland, cismontane woodland, lower montane coniferous forest. Occurs on rocky and sandy sites, usually of granitic or alluvial material. Can be very common after fire. 60-2,500 m.	-	4.2
Calochortus weedii var. *intermedius* intermediate mariposa-lily	Coastal scrub, chaparral, valley and foothill grassland. Dry, rocky open slopes and rock outcrops. 60-1,575 m.	-	1B.2
Calystegia felix lucky morning-glory	Meadows and seeps, riparian scrub. Sometimes alkaline, alluvial. 30-215 m.	-	1B.1
Centromadia pungens ssp. *laevis* smooth tarplant	Valley and foothill grassland, chenopod scrub, meadows and seeps, playas, riparian woodland. Alkali meadow, alkali scrub; also in disturbed places. 5-1,170 m.	-	1B.1
Chorizanthe parryi var. *fernandina* San Fernando Valley spineflower	Coastal scrub, valley and foothill grassland. Sandy soils. 15-1,015 m.	PT, SE	1B.1
Chorizanthe polygonoides var. *longispina* long-spined spineflower	Chaparral, coastal scrub, meadows and seeps, valley and foothill grassland, vernal pools. Gabbroic clay. 30-1,540 m.	-	1B.2
Cladium californicum California saw-grass	Meadows and seeps, marshes and swamps (alkaline or freshwater). Freshwater or alkaline moist habitats. -40-2150 m.	-	2B.2
Dodecahema leptoceras slender-horned spineflower	Chaparral, cismontane woodland, coastal scrub (alluvial fan sage scrub). Flood deposited terraces and washes; associates include *Encelia*, *Dalea*, *Lepidospartum*, etc. Sandy soils. 200-765 m.	FE, SE	1B.1
Dudleya multicaulis many-stemmed dudleya	Chaparral, coastal scrub, valley and foothill grassland. In heavy, often clayey soils or grassy slopes. 15-790 m.	-	1B.2
Eriastrum densifolium ssp. *sanctorum* Santa Ana River woollystar	Coastal scrub, chaparral. In sandy soils on river floodplains or terraced fluvial deposits. 180-700 m.	FE, SE	1B.1
Hesperocyparis forbesii Tecate cypress	Closed-cone coniferous forest, chaparral. Primarily on north-facing slopes; groves often associated with chaparral. On clay or gabbro. 60-1,650 m.	-	1B.1
Horkelia cuneata var. *puberula* mesa horkelia	Chaparral, cismontane woodland, coastal scrub. Sandy or gravelly sites. 15-1,645 m.	-	1B.1

Species Name	Habitat[1]	Status	CRPR
Juglans californica Southern California black walnut	Hillsides and canyons, usually with alluvial substrates in chaparral, cismontane woodland, coastal scrub, and riparian woodland. 50-900 m.	-	4.2
Lepechinia cardiophylla heart-leaved pitcher sage	Closed-cone coniferous forest, chaparral, cismontane woodland. 520-1,370 m.	-	1B.2
Lepidium virginicum var. *robinsonii* Robinson's pepper-grass	Chaparral, coastal scrub. Dry soils, shrubland. 4-1,435 m.	-	4.3
Monardella australis ssp. *jokerstii* Jokerst's monardella	Lower montane coniferous forest, chaparral. Steep scree or talus slopes between breccia. Secondary alluvial benches along drainages and washes. 1,350-1,750 m.	-	1B.1
Monardella hypoleuca ssp. *intermedia* intermediate monardella	Chaparral, cismontane woodland, lower montane coniferous forest (sometimes). Often in steep, brushy areas. 195-16,750 m.	-	1B.3
Muhlenbergia californica California muhly	Coastal scrub, chaparral, lower montane coniferous forest, meadows and seeps. Usually found near streams or seeps. 100-2000 m.	-	4.3
Muhlenbergia utilis aparejo grass	Meadows and seeps, marshes and swamps, chaparral, coastal scrub, cismontane woodland. Sometimes alkaline, sometimes serpentinite. 25-2325 m.	-	2B.2
Navarretia prostrata prostrate vernal pool navarretia	Coastal scrub, valley and foothill grassland, vernal pools, meadows and seeps. Alkaline soils in grassland, or in vernal pools. Mesic, alkaline sites. 3-1235 m.	-	1B.2
Nolina cismontana chaparral nolina	Chaparral, coastal scrub. Primarily on sandstone and shale substrates; also known from gabbro. 140-1,275 m.	-	1B.2
Penstemon californicus California beardtongue	Chaparral, lower montane coniferous forest, pinyon and juniper woodland. Stony slopes and shrubby openings; sandy or granitic soils. 1,170-2,300 m.	-	1B.2
Pentachaeta aurea ssp. *allenii* Allen's pentachaeta	Valley and foothill grasslands, coastal scrub. Openings in scrub or grassland. 75-520 m.	-	1B.1
Pseudognaphalium leucocephalum white rabbit-tobacco	Riparian woodland, cismontane woodland, coastal scrub, chaparral. Sandy, gravelly sites. 35-515 m.	-	2B.2
Sagittaria sanfordii Sanford's arrowhead	Standing or slow-moving freshwater ponds, marshes, swamps, and ditches. 0-605 m.	-	1B.2
Senecio aphanactis chaparral ragwort	Occurs in dry open rocky areas in chaparral, cismontane woodland, and coastal scrub. Sometimes occurs in alkaline flats. 15-800 m.	-	2B.2
Sidalcea neomexicana salt spring checkerbloom	Playas, chaparral, coastal scrub, lower montane coniferous forest, Mojavean desert scrub. Alkali springs and marshes. 3-2,380 m.	-	2B.2
Symphyotrichum defoliatum San Bernardino aster	Meadows and seeps, cismontane woodland, coastal scrub, lower montane coniferous forest, marshes and swamps, valley and foothill grassland. Vernally mesic grassland or near ditches, streams and springs; disturbed areas. 2-2,040 m.	-	1B.2

Species Name	Habitat[1]	Status	CRPR
Thysanocarpus rigidus rigid fringepod	Pinyon and juniper woodland. Dry, rocky slopes and ridges of oak and pine woodland in arid mountain ranges. 425-2165 m.	-	1B.2

1. Habitat descriptions sourced from the general and microhabitat descriptions listed in CNDDB as well as CNPS Rare Plant Inventory and Jepson eFlora.

Note: Species included in this table have at least one CNDDB occurrence in San Dimas, Ontario, Yorba Linda, Prado Dam, and/or Black Star Canyon quads.

FE = Federally Endangered

FT = Federally Threatened

PT = Federally Proposed Threatened

SE = State Endangered

ST = State Threatened

CRPR = California Rare Plant Rank.

1A: Presumed extinct in California

1B: Rare, threatened, or endangered in California and elsewhere.

2: Rare, threatened, or endangered in California, but more common elsewhere.

3: More information needed (Review List)

4: Limited distribution (Watch List)

0.1: Seriously threatened in California.

0.2: Fairly threatened in California.

0.3: Not very threatened in California.

APPENDIX B

Special-Status Wildlife

Table B.1. Special-Status Wildlife Species in the Study Area

Species Name	Habitat[1]	Status
Invertebrates		
Bombus crotchii Crotch bumble bee	Coastal California east to the Sierra-Cascade crest and south into Mexico. Food plant genera include *Antirrhinum*, *Phacelia*, *Clarkia*, *Dendromecon*, *Eschscholzia*, and *Eriogonum*.	SA
Gonidea angulate Western ridged mussel	Primarily creeks and rivers and less often lakes. Originally in most of state, now extirpated from Central and Southern California.	SA
Branchinecta sandiegonensis San Diego fairy shrimp	Endemic to San Diego and Orange County mesas. Vernal pools.	FE
Diplectrona californica California diplectronan caddisfly	No information has been published on the larva of this species, but other larvae in the genus live in fast-flowing, cool streams.[2]	SA
Euphydryas editha quino quino checkerspot butterfly	Sunny openings within chaparral and coastal sage shrublands in parts of Riverside and San Diego counties. Hills and mesas near the coast. Need high densities of food plants *Plantago erecta*, *P. insularis*, and *Castilleja exserta*.	FE
Neolarra alba white cuckoo bee	Known only from localities in Southern California.	SA
Fish		
Catostomus santaanae Santa Ana sucker[3]	Endemic to Los Angeles Basin south coastal streams. Habitat generalists, but prefer sand-rubble-boulder bottoms, cool, clear water, and algae.	FT
Gila orcuttii arroyo chub	Native to streams from Malibu Creek to San Luis Rey River basin. Introduced into streams in Santa Clara, Ventura, Santa Ynez, Mojave & San Diego river basins. Slow water stream sections with mud or sand bottoms. Feeds heavily on aquatic vegetation and associated invertebrates.	SSC
Oncorhynchus mykiss irideus pop. 10 steelhead - southern California Distinct Population Segments (DPS)	Federal listing refers to populations from Santa Maria River south to southern extent of range (San Mateo Creek in San Diego County). Southern steelhead likely have greater physiological tolerances to warmer water and more variable conditions.	FE, CE
Amphibians		
Spea hammondii western spadefoot	Occurs primarily in grassland habitats, but can be found in valley-foothill hardwood woodlands. Vernal pools are essential for breeding and egg-laying.	SSC
Taricha torosa Coast Range newt	Coastal drainages from Mendocino County to San Diego County. Lives in terrestrial habitats and will migrate over 1 km to breed in ponds, reservoirs and slow moving streams.	SSC
Reptiles		
Anniella stebbinsi Southern California legless lizard	Generally south of the Transverse Range, extending to northwestern Baja California. Occurs in sandy or loose loamy soils under sparse vegetation. Disjunct populations in the Tehachapi and Piute Mountains in Kern County. Variety of habitats; generally in moist, loose soil. They prefer soils with a high moisture content.	SSC
Arizona elegans occidentalis California glossy snake	Patchily distributed from the eastern portion of San Francisco Bay, southern San Joaquin Valley, and the Coast, Transverse, and Peninsular ranges, south to Baja California. Generalist reported from a range of scrub and grassland habitats, often with loose or sandy soils.	SSC
Aspidoscelis hyperythra orange-throated whiptail	Inhabits low-elevation coastal scrub, chaparral, and valley-foothill hardwood habitats. Prefers washes and other sandy areas with patches of brush and rocks. Perennial plants necessary for its major food: termites.	WL

Species Name	Habitat[1]	Status
Aspidoscelis tigris stejnegeri coastal whiptail	Found in deserts and semi-arid areas with sparse vegetation and open areas. Also found in woodland & riparian areas. Ground may be firm soil, sandy, or rocky.	SSC
Crotalus ruber red-diamond rattlesnake	Chaparral, woodland, grassland, & desert areas from coastal San Diego County to the eastern slopes of the mountains. Occurs in rocky areas and dense vegetation. Needs rodent burrows, cracks in rocks or surface cover objects.	SSC
Emys marmorata western pond turtle	A thoroughly aquatic turtle of ponds, marshes, rivers, streams and irrigation ditches, usually with aquatic vegetation, below 6,000 ft elevation. Needs basking sites and suitable (sandy banks or grassy open fields) upland habitat up to 0.5 km from water for egg-laying.	SSC
Phrynosoma blainvillii coast horned lizard	Frequents a wide variety of habitats, most common in lowlands along sandy washes with scattered low bushes. Open areas for sunning, bushes for cover, patches of loose soil for burial, and abundant supply of ants and other insects.	SSC
Salvadora hexalepis virgultea coast patch-nosed snake	Brushy or shrubby vegetation in coastal Southern California. Require small mammal burrows for refuge and overwintering sites.	SSC
Thamnophis hammondii two-striped gartersnake	Coastal California from vicinity of Salinas to northwest Baja California. From sea to about 7,000 feet elevation. Highly aquatic, found in or near permanent fresh water. Often along streams with rocky beds and riparian growth.	SSC
Birds		
Accipiter cooperii *Cooper's hawk*	Woodland, chiefly of open, interrupted or marginal type. Nest sites mainly in riparian growths of deciduous trees, as in canyon bottoms on river flood-plains; also, live oaks.	WL
Agelaius tricolor tricolored blackbird	Highly colonial species, most numerous in Central Valley and vicinity. Largely endemic to California. Requires open water, protected nesting substrate, and foraging area with insect prey within a few km of the colony.	ST, SSC
Aimophila ruficeps canescens southern California rufous-crowned sparrow	Resident in Southern California coastal sage scrub and sparse mixed chaparral. Frequents relatively steep, often rocky hillsides with grass and forb patches.	WL
Ammodramus savannarum grasshopper sparrow	Dense grasslands on rolling hills, lowland plains, in valleys and on hillsides on lower mountain slopes. Favors native grasslands with a mix of grasses, forbs and scattered shrubs. Loosely colonial when nesting.	SSC
Aquila chrysaetos golden eagle	Rolling foothills, mountain areas, sage-juniper flats, and desert. Cliff-walled canyons provide nesting habitat in most parts of range; also, large trees in open areas.	FP
Asio otus long-eared owl	Riparian bottomlands grown to tall willows and cottonwoods; also, belts of live oak paralleling stream courses. Require adjacent open land, productive of mice and the presence of old nests of crows, hawks, or magpies for breeding.	SSC
Athene cunicularia burrowing owl	Open, dry annual or perennial grasslands, deserts, and scrublands characterized by low-growing vegetation. Subterranean nester, dependent upon burrowing mammals, most notably, the California ground squirrel.	SSC
Buteo swainsoni Swainson's hawk	Breeds in grasslands with scattered trees, juniper-sage flats, riparian areas, savannahs, & agricultural or ranch lands with groves or lines of trees. Requires adjacent suitable foraging areas such as grasslands, or alfalfa or grain fields supporting rodent populations.	ST
Campylorhynchus brunneicapillus sandiegensis coastal cactus wren	Southern California coastal sage scrub. Wrens require tall opuntia cactus for nesting and roosting.	SSC

Species Name	Habitat[1]	Status
Coccyzus americanus occidentalis western yellow-billed cuckoo	Riparian forest nester, along the broad, lower flood-bottoms of larger river systems. Nests in riparian jungles of willow, often mixed with cottonwoods, with lower story of blackberry, nettles, or wild grape.	FT, SE
Coturnicops noveboracensis yellow rail	Summer resident in eastern Sierra Nevada in Mono County. Freshwater marshlands.	SSC
Elanus leucurus white-tailed kite	Rolling foothills and valley margins with scattered oaks & river bottomlands or marshes next to deciduous woodland. Open grasslands, meadows, or marshes for foraging close to isolated, dense-topped trees for nesting and perching.	FP
Empidonax traillii extimus southwestern willow flycatcher	Riparian woodlands in Southern California.	FE, SE
Eremophila alpestris actia California horned lark	Coastal regions, chiefly from Sonoma County to San Diego County. Also, main part of San Joaquin Valley and east to foothills. Short-grass prairie, "bald" hills, mountain meadows, open coastal plains, fallow grain fields, alkali flats.	WL
Falco columbarius merlin	Seacoast, tidal estuaries, open woodlands, savannahs, edges of grasslands and deserts, farms and ranches. Clumps of trees or windbreaks are required for roosting in open country.	WL
Falco peregrinus anatum American peregrine falcon	Near wetlands, lakes, rivers, or other water; on cliffs, banks, dunes, mounds; also, human-made structures. Nest consists of a scrape or a depression or ledge in an open site.	FP
Haliaeetus leucocephalus bald eagle	Ocean shore, lake margins, and rivers for both nesting and wintering. Most nests within 1 mile of water. Nests in large, old-growth, or dominant live tree with open branches, especially ponderosa pine. Roosts communally in winter.	SE, FP
Icteria virens yellow-breasted chat	Summer resident; inhabits riparian thickets of willow and other brushy tangles near watercourses. Nests in low, dense riparian, consisting of willow, blackberry, wild grape; forages and nests within 10 feet of ground.	SSC
Laterallus jamaicensis coturniculus California black rail	Inhabits freshwater marshes, wet meadows and shallow margins of saltwater marshes bordering larger bays. Needs water depths of about 1 inch that do not fluctuate during the year and dense vegetation for nesting habitat.	ST, FP
Polioptila californica coastal California gnatcatcher[3]	Obligate, permanent resident of coastal sage scrub below 2500 feet in Southern California. Low, coastal sage scrub in arid washes, on mesas and slopes. Not all areas classified as coastal sage scrub are occupied.	FT, SSC
Setophaga petechia yellow warbler	Riparian plant associations in close proximity to water. Also nests in montane shrubbery in open conifer forests in Cascades and Sierra Nevada. Frequently found nesting and foraging in willow shrubs and thickets, and in other riparian plants including cottonwoods, sycamores, ash, and alders.	SSC
Vireo bellii pusillus least Bell's vireo[3]	Summer resident of Southern California in low riparian in vicinity of water or in dry river bottoms; below 2000 feet. Nests placed along margins of bushes or on twigs projecting into pathways, usually willow, *Baccharis*, and mesquite.	FE, SE
Mammals		
Antrozous pallidus pallid bat	Deserts, grasslands, shrublands, woodlands and forests. Most common in open, dry habitats with rocky areas for roosting. Roosts must protect bats from high temperatures. Very sensitive to disturbance of roosting sites.	SSC
Chaetodipus fallax ssp. fallax northwestern San Diego pocket mouse	Coastal scrub, chaparral, grasslands, sagebrush, etc. in western San Diego County. Sandy, herbaceous areas, usually in association with rocks or coarse gravel.	SSC
Dipodomys merriami parvus San Bernardino kangaroo rat	Alluvial scrub vegetation on sandy loam substrates characteristic of alluvial fans and flood plains. Needs early to intermediate seral stages.	FE, CE SSC

Species Name	Habitat[1]	Status
Eumops perotis californicus western mastiff bat	Many open, semi-arid to arid habitats, including conifer & deciduous woodlands, coastal scrub, grasslands, chaparral, etc. Roosts in crevices in cliff faces, high buildings, trees and tunnels.	SSC
Lasiurus xanthinus western yellow bat	Found in valley foothill riparian, desert riparian, desert wash, and palm oasis habitats. Roosts in trees, particularly palms. Forages over water and among trees.	SSC
Neotoma lepida intermedia San Diego desert woodrat	Coastal scrub of Southern California from San Diego County to San Luis Obispo County. Moderate to dense canopies preferred. They are particularly abundant in rock outcrops, rocky cliffs, and slopes.	SSC
Nyctinomops femorosaccus pocketed free-tailed bat	Variety of arid areas in Southern California; pine-juniper woodlands, desert scrub, palm oasis, desert wash, desert riparian, etc. Rocky areas with high cliffs.	SSC
Nyctinomops macrotis big free-tailed bat	Low-lying arid areas in Southern California. Need high cliffs or rocky outcrops for roosting sites. Feeds principally on large moths.	SSC
Taxidea taxus American badger	Most abundant in drier open stages of most shrub, forest, and herbaceous habitats, with friable soils. Needs sufficient food, friable soils and open, uncultivated ground. Preys on burrowing rodents. Digs burrows.	SSC

1**:** Habitat descriptions sourced from the general and microhabitat descriptions listed in CNDDB.

2: Shanks, S. Undated. *Diplectrona californica*. California Department of Fish and Game, Natural Diversity Database

3: Critical Habitat for this species is present within or immediately adjacent to the study area.

Note: Species included in this table have at least one CNDDB occurrence in San Dimas, Ontario, Yorba Linda, Prado Dam, and/or Black Star Canyon quads.

FE = Federally Endangered

FT = Federally Threatened

SE = State Endangered

ST = State Threatened

CE = State Candidate for Endangered Listing

FP = CDFW Fully Protected

SA = CDFW Special Animals

SSC = CDFW Species of Special Concern

APPENDIX J: CULTURAL REPORT

CULTURAL RESOURCES TECHNICAL REPORT FOR THE CHINO HILLS GENERAL PLAN UPDATE, CITY OF CHINO HILLS, CALIFORNIA

NOVEMBER 2023

PREPARED FOR

EcoTierra Consulting, Inc.

PREPARED BY

SWCA Environmental Consultants

CULTURAL RESOURCES TECHNICAL REPORT FOR THE CHINO HILLS GENERAL PLAN UPDATE CITY OF CHINO HILLS, CALIFORNIA

Prepared for

EcoTierra Consulting, Inc.
5776-D Lindero Canyon Road #414
Westlake Village, California 91362
Attn: Curtis Zacuto

Prepared by

Bobbette Biddulph, B.S., Project Manager – Planning
Susan Zamudio-Gurrola, M.H.P., Project Manager – Historic Preservation
Debi Howell-Ardila, M.H.P., Senior Architectural Historian
Liz Denniston, M.A., RPA, Senior Team Lead – Archaeology
John Eddy, M.A. RPA, Principal Investigator – Archaeology

SWCA Environmental Consultants
320 North Halstead Street, Suite 120
Pasadena, CA 91107
(626) 240-0587
www.swca.com

SWCA Project No. 66884
SWCA Cultural Resources Report No. 22-633

November 2023

EXECUTIVE SUMMARY

Purpose and Scope: On behalf of the City of Chino Hills (City), EcoTierra Consulting, Inc. (EcoTierra) retained SWCA Environmental Consultants (SWCA) to conduct a cultural resources assessment for the Chino Hills General Plan Update (project) in the city of Chino Hills, San Bernardino County, California. A major component of the General Plan Update is to implement the City's 6th Cycle Housing Element for the 2021-2029 planning period (Housing Element). The project also includes updates to the existing Land Use, Circulation, Safety, Conservation, Parks/Recreation/Open Space, Noise and Economic Development Elements. The project also includes rezoning of the Housing Element opportunity sites to meet the City's Regional Housing Needs Assessment (RHNA) allocations, and revisions to the General Plan Land Use Map and Zoning map. The Housing Element identifies 19 RHNA sites to meet the City's "lower income," "moderate income," and "above moderate income" RHNA allocation. Of those sites, 11 require a General Plan Land Use Map change accomplished through the General Plan Update process. These 11 sites also require a rezoning or specific plan amendment to ensure consistency with the changed General Plan Land Use Map designations.

The City requires this study to consider potential impacts this project may have on significant cultural resources to comply with the California Environmental Quality Act (CEQA) and California State and local regulations. The City prepared an update to its General Plan in 2015 and a General Plan Environmental Impact Report (EIR), which was certified in 2015. With the current update process, the City is preparing a Subsequent EIR (SEIR). A SEIR is required as the General Plan Update proposes substantial changes to the City's 2015 General Plan. The SEIR will consider whether this current Update would result in new significant impacts not identified in the 2015 Chino Hills General Plan Update EIR.

This cultural resources assessment, which also serves as baseline information for the City General Plan update, analyzes the Chino Hills city limits at a program-level. This program-level analysis included a confidential records search of the California Historical Resources Information System (CHRIS) and a Sacred Lands File (SLF) search through the California Native America Heritage Commission (NAHC).

Of the 11 RHNA sites requiring General Plan Land Use Map amendments, two are designated for low density residential use (Site 10 - Canyon Estates [Low Density] and Site 11 - Los Serranos Golf Course [Low Density]), two are designated for medium density residential use (Site 8 - Canyon Estates [Medium Density], and Site 9 - Wang] Medium Density]), and seven of the sites are suitable for high density and/or lower income housing (Site 1 - The Shoppes II, Site 2 - Community Park Overflow, Site 3 - Los Serranos Golf Course, Site 4 - Western Hills Golf Course, Site 5 - Wang [High Density], Site 6 - The Shoppes, and Site 7 - The Commons).

At the request of the City, the two RHNA sites designated for low density residential use (Sites 10 and 11) are included in the program-level analysis. The remaining nine RHNA sites are examined at a more detailed, site-specific level (Sites 1 through 9). Building on the program-level analysis outlined above, the site-specific assessment included review of pertinent local reports, detailed property-specific research, and archaeological and built environment field surveys.

Dates of Investigation: At SWCA's request, the South Central Coastal Information Center (SCCIC) at California State University, Fullerton conducted a CHRIS records search for the General Plan Update area on August 4, 2022. SWCA received the results of the SLF search from the NAHC on June 13, 2022. A built environment survey was conducted on July 5, 2022, of two RHNA sites containing buildings or structures over 45 years old (Sites 3 and 4). On August 17 to 19, 2022, an intensive and reconnaissance archaeological resources survey was completed for seven of the 11 proposed RHNA sites (Sites 1 through 5, 8, and 9). Two RHNA sites (Sites 6 and 7) are fully developed, so archaeological pedestrian survey was not warranted.

Summary of Findings: The CHRIS records search indicates 105 previous cultural resource studies were conducted within the study area, and 142 previously recorded cultural resources were identified within the study area. Of those resources, 70 are prehistoric archaeological resources, 33 are historic-period archaeological resources, 14 are multicomponent resources, 34 are historic-period built environment resources, and two resources cannot be categorized due to insufficient information.

Native American coordination conducted in support of the 2015 General Plan Update concluded that the entire city is sensitive for prehistoric resources. As a result of this finding, Goal CN-2 of the 2015 General Plan was established. Specifically, consultation with local Native American tribes is required for each project within the General Plan study area.

On May 10, 2022, SWCA requested a records search of the SLF and a list of Native American contacts for the study area from the NAHC. SWCA received a response letter from the NAHC dated June 13, 2022, which indicated that a record of a sacred site had been identified within the study area. The NAHC recommended contacting the Gabrieleno (Tongva) San Gabriel Band of Mission Indians for additional information. The NAHC also provided a list of 16 Native American groups and individuals who may have knowledge of cultural resources in the study area.

Of the 16 Native American groups and individuals identified in response to the SLF search, two had previously requested Assembly Bill (AB 52) consultation for all projects with the city: the Gabrieleño Band of Mission Indians – Kizh Nation and the Soboba Band of Luiseño Indians. On May 16, 2022, the City mailed letters to the two Tribes. Pursuant to the requirements of AB 52, each letter included a description of the City's efforts to update the General Plan (project description) and notified each contact that requests for formal consultation were required to be sent within 30 days. On May 25, 2022, the Gabrieleño Band of Mission Indians – Kizh Nation responded, acknowledging the project's intent. The letter stated that they are not pursuing AB 52 consultation for the General Plan Update but requested consultation status for all future projects. To date, no additional requests for consultation have been received in response to the AB 52 notification letters.

On September 13, 2022, the City mailed letters to all 15 interested Native American groups and individuals included on the county-wide consultation list. Pursuant to the requirements of SB 18, each letter included a description of the City's efforts to update the General Plan (project description) and notified each contact that requests for formal consultation were required to be sent within 90 days. On September 19, 2022, the Gabrieleño Band of Mission Indians – Kizh Nation responded, acknowledging the project's intent. The letter stated that they are not pursuing AB 52 consultation for the General Plan Update but requested consultation status for all future projects. To date, no additional requests for consultation have been received in response to the AB 52 notification letters.

The program-level analysis concluded that implementation of the City's existing General Plan Policies would reduce any potential impacts to archaeological resources to less-than-significant levels, pursuant to CEQA. Therefore, the requirements established in the 2015 Chino Hills General Plan would still be applicable to the current General Plan Update SEIR for all future development.

The archaeological site-specific analysis concluded that no archaeological resources would be directly impacted by implementation of the development plans for the nine RHNA sites. Any ground disturbance, however, has the potential to expose and/or displace archaeological resources, constituting a potentially significant impact requiring the consideration of mitigation measures. Accordingly, Mitigation Measure (MM) RHNA-CUL-11, requiring the retention of a qualified archaeologist, development of an archaeological resources monitoring plan, and archaeological monitoring, shall be implemented.

Future development or improvements related to changes in land use could potentially cause significant adverse impacts to historical resources. The General Plan study area contains properties that are 50 years

or older, and it is possible that future development in the General Plan area will result in the identification of additional historical resources. As the 8-year cycle for the Housing element spans 2021 through 2029, properties that were developed before 1984 will meet the age criterion for assessment to determine if they qualify as historical resources pursuant to CEQA. Therefore, adoption of the General Plan could result in significant adverse impacts and material impairment to historical resources, and mitigation is required. As a result, MM GP-CR-1, requiring a historical resources assessment and evaluation, shall be implemented.

Two properties that are over 45 years old were identified on RHNA sites: the Los Serranos Golf Club (RHNA Site 3 and Site 11) and Western Hills Country Club (RHNA Site 4). The two properties were recorded on California Department of Parks and Recreation (DPR) 523 series forms, and evaluated for eligibility for listing in the National Register of Historic Places (NRHP) and California Register of Historical Resources (CRHR). Both properties are recommended not eligible for the NRHP and CRHR under all criteria as they lack association with significant events and individuals (Criteria A/1 and B/2), and do not embody the distinctive characteristics of a type, period, or method of construction, or represent the work of a master architect or engineer (Criterion C/3). Therefore, neither the Los Serranos Golf Club nor Western Hills Country Club are considered historical resources for the purposes of CEQA.

The remaining RHNA sites identified by the City are either undeveloped (Sites 1, 5, 8, and 9) or contain properties that are less than 45 years old (Sites 6, 7 and 10). Those properties within the RHNA sites that are presently developed, but are not yet 45 years old, contain buildings and/or structures that were constructed between 1999 and 2014, therefore, will not come of age until 2044 at the earliest. Therefore, no additional analysis is required for historical resources.

Disposition of Data: The final cultural resources assessment report and any subsequent related reports will be filed with City of Chino Hills; the SCCIC at California State University, Fullerton; and with SWCA's Pasadena, California, office. All field notes, photographs, and records related to the current study are on file at the SWCA Pasadena office.

CONTENTS

1 Introduction 1
2 Project Location 2
3 Project Description 2
3.1 General Plan Update Overview 2
3.2 Housing Element, RHNA Sites, and Related Project Actions 13
4 Regulatory Framework 16
4.1 Federal 16
4.1.1 National Historic Preservation Act of 1966 16
4.1.2 National Register of Historic Places 16
4.1.3 Native American Graves Protection and Repatriation Act 17
4.2 State 18
4.2.1 California Environmental Quality Act 18
4.2.2 California Register of Historical Resources 21
4.2.3 Treatment of Human Remains 21
4.3 Local 22
4.3.1 City of Chino Hills General Plan 22
5 Setting 23
5.1 Environmental Setting 23
5.2 Cultural Setting 24
5.2.1 Prehistoric Overview 24
5.2.2 Horizon I (Early Man) (ca. 10,000–6000 B.C.) 24
5.2.3 Horizon II (Milling Stone) (6000–3000 B.C.) 24
5.2.4 Horizon III (Intermediate) (3000 B.C.–A.D. 500) 25
5.2.5 Horizon IV (Late Prehistoric) (A.D. 500–Historic Contact) 26
5.2.6 Ethnographic Overview 26
5.2.7 Native American Communities Adjacent to the Study Area 29
5.2.8 Historic Overview 33
5.2.9 Spanish Period (1769–1821) 33
5.2.10 Mexican Period (1821–1848) 33
5.2.11 American Period (1848–Present) 34
5.2.12 City of Chino Hills 34
6 Native American Consultation 39
6.1 Sacred Lands File Search 39
6.2 Assembly Bill 52 and Senate Bill 18 Notification 40
7 Program-Level Analysis of the City Limits and Two RHNA Sites 40
7.1 California Historical Resources Information System Records Search 40
7.1.1 Methods 40
7.1.2 Results 41
7.2 Native American Consultation 43
7.3 Impact Assessment 43
7.3.1 Significance Thresholds 43
7.4 Recommended Impact Avoidance and Mitigation Measures 44
7.4.1 General Plan Policies 44
7.4.2 Mitigation Measures 46

8 Project-Specific Analysis of the Regional Housing Needs Assessment Sites 46
8.1 California Historical Resources Information System Records Search 47
8.1.1 Methods 47
8.1.2 Results 47
8.2 Native American Consultation 48
8.3 Archaeological and Built Environment Field Surveys 48
8.3.2 Built Environment Resources 52
8.4 Impact Assessment and Mitigation Measure for RHNA Sites 74
8.4.1 Significance Thresholds 74
8.4.2 Mitigation Measures 75
9 References Cited 77

Appendices

Appendix A. California Historical Resources Information System Records Search Results (CONFIDENTIAL)
Appendix B. Native American Heritage Commission Sacred Lands File Search Results Letter (CONFIDENTIAL)
Appendix C. California Department of Parks and Recreation 523-Series Forms (CONFIDENTIAL)

Figures

Figure 1. Project vicinity with the city limits and RHNA site locations within San Bernardino County. 3
Figure 2. Project site plotted on a 2021 aerial photograph. 4
Figure 3. Project location depicted on U.S. Geological Survey quadrangles. Map 1 of 8. 5
Figure 4. Project location depicted on U.S. Geological Survey quadrangles. Map 2 of 8. 6
Figure 5. Project location depicted on U.S. Geological Survey quadrangles. Map 3 of 8. 7
Figure 6. Project location depicted on U.S. Geological Survey quadrangles. Map 4 of 8. 8
Figure 7. Project location depicted on U.S. Geological Survey quadrangles. Map 5 of 8. 9
Figure 8. Project location depicted on U.S. Geological Survey quadrangles. Map 6 of 8. 10
Figure 9. Project location depicted on U.S. Geological Survey quadrangles. Map 7 of 8. 11
Figure 10. Project location depicted on U.S. Geological Survey quadrangles. Map 8 of 8. 12
Figure 11. Native American territorial boundaries based on ethnographic and Tribal sources. 28
Figure 12. Ancient village sites in Gabrielino territory (based on Johnston 1962). 31
Figure 13. Ancient village sites in Gabrielino territory (based on Kirkman 1937). 32
Figure 14. Chino Hills area southwest of the town of Chino depicted on an 1887 map by H.B. Martin (Source: Huntington Library). 35
Figure 15. Nearly 20 years after opening, in 1928, the Boys Republic (lower right corner) was still surrounded by primarily undeveloped hilly and agricultural land (Source: University of California, Santa Barbara Library 1928a). 36
Figure 16. The rural Sleepy Hollow area showed sparse development in 1928 (Carbon Canyon Road is the prominent thoroughfare) (Source: UCSB Library 1928b). 37
Figure 17. In 1946, more than 20 years after Los Serranos Country Club opened, the adjacent residential lots to the north were still sparsely developed (Source: UCSB Library 1946). 38
Figure 18. Site 1 – The Shoppes II, view south. 49
Figure 19. Site 2 – Community Park Overflow, view east. 49

Figure 20. Site 3 – Los Serranos Golf Course, view south. 50
Figure 21. Site 4 – Western Hills Country Club, view northeast. 50
Figure 22. Site 5 – Wang (High Density), view east. 51
Figure 23. Site 8 – Canyon Estates (Medium Density), view southwest. 51
Figure 24. Site 9 – Wang (Medium Density), view northwest. 52
Figure 25. Los Serranos Golf Club overview near Hole 8, view facing west. 55
Figure 26. Los Serranos Golf Club entrance and clubhouse, view from Yorba Avenue, facing west. 56
Figure 27. Los Serranos Golf Club clubhouse, north elevation, view southeast. 56
Figure 28. Los Serranos Golf Club starter building, south and east elevations, view southwest. 57
Figure 29. Los Serranos Golf Club maintenance building, north elevation, view south. 57
Figure 30. Los Serranos Golf Club ancillary building, east elevation, view west. 58
Figure 31. The original clubhouse and former Bridger/Gird adobe building (no longer extant) (Source: Spitzerri 2020b; California State Library, n.d). 59
Figure 32. Clubhouse off the entry drive (near top) and what appear to be the cabanas to the southwest in 1935 (Source: UCSB Library 1935). 60
Figure 33. Only a handful of homes had been built in the lots adjacent to the Los Serranos Golf Club by 1935 (Source: UCSB Library 1935). 61
Figure 34. The lots adjacent to the Los Serranos Golf Club were still sparsely developed in 1946 (Source: UCSB Library 1946). 62
Figure 35. Demolition of the original clubhouse in a 1994 photograph (Source: *Chino Hills Champion* 1994). 64
Figure 36. Clubhouse, south façade and east elevation, view looking northwest. 69
Figure 37. Clubhouse, north elevation, view looking southwest. 69
Figure 38. Swimming pool building, view looking north. 70
Figure 39. Swimming pool, view looking northeast. 70
Figure 40. Restroom building, west and north elevations, view looking east. 71

Tables

Table 1. Known Golf Courses Associated with John Duncan Dunn 65
Table 2. Known Golf Courses Associated with Harry Rainville 73

1 INTRODUCTION

On behalf of the City of Chino Hills (City), EcoTierra Consulting, Inc. (EcoTierra) retained SWCA Environmental Consultants (SWCA) to conduct a cultural resources assessment for the Chino Hills General Plan Update (project) in the city of Chino Hills, San Bernardino County, California (Figure 1). A major component of the General Plan Update is to implement the City's 6th Cycle Housing Element for the 2021-2029 planning period (Housing Element). The project also includes updates to the existing Land Use, Circulation, Safety, Conservation, Parks/Recreation/Open Space, Noise and Economic Development Elements. The project also includes rezoning of the Housing Element opportunity sites to meet the City's Regional Housing Needs Assessment (RHNA) allocations, and revisions to the General Plan Land Use Map and Zoning map. The Housing Element identifies 19 RHNA sites to meet the City's "lower income," "moderate income," and "above moderate income" RHNA allocation. Of those sites, 11 require a General Plan Land Use Map change accomplished through the General Plan Update process. These 11 sites also require a rezoning or specific plan amendment to ensure consistency with the changed General Plan Land Use Map designations.

The City requires this study to consider potential impacts this project may have on significant cultural resources to comply with the California Environmental Quality Act (CEQA) and California State and local regulations. The City prepared a comprehensive update to its General Plan in 2015 and a General Plan Environmental Impact Report (EIR), which was certified in 2015. With this current update process, the City is preparing a Subsequent EIR (SEIR). A SEIR is required, as the General Plan Update proposes substantial changes to the City's 2015 General Plan. The SEIR will consider whether this current General Plan Update would result in new significant impacts not identified in the 2015 Chino Hills General Plan Update EIR.

This cultural resources assessment, which also serves as baseline information for the City General Plan update, analyzes the Chino Hills city limits at a program-level. This program-level analysis included a confidential records search of the California Historical Resources Information System (CHRIS) and a Sacred Lands File (SLF) search through the California Native America Heritage Commission (NAHC).

Of the 11 RHNA sites requiring General Plan Land Use Map amendments, two are designated for low density residential use (Canyon Estates [Low Density] and Los Serranos Golf Course [Low Density]), two are designated for medium density residential use (Canyon Estates [Medium Density], and Wang]Medium Density]), and seven of the sites are suitable for high density and/or lower income housing [The Shoppes II, Community Park Overflow, Los Serranos Golf Course, Western Hills Golf Course, Wang [High Density], The Shoppes, and The Commons). Each project site is described in Section 3.2.

At the request of the City, the two RHNA sites designated for low density residential use ([Canyon Estates (Low Density) and Los Serranos Golf Course (Low Density]) are included in the program-level analysis. The remaining nine RHNA sites are examined at a more detailed, site-specific level. Building on the program-level analysis outlined above, the site-specific assessment included review of pertinent local reports, detailed property-specific research, and archaeological and built environment field surveys. This technical report presents the results of the CHRIS and SLF searches, archival research, and a discussion of potential impacts to significant cultural resources that could result from total build-out. The report also includes mitigation recommendations to reduce potential impacts to less-than-significant levels, pursuant to CEQA.

The property-specific research will facilitate development of the sites to meet the City's share of regional housing needs and streamline their subsequent development review. Seven of the nine RHNA sites contain undeveloped land, so an archaeological survey was completed. The two remaining sites (The Shoppes and The Commons) are fully developed, so archaeological pedestrian survey was not warranted.

SWCA Project Manager Susan Zamudio-Gurrola, M.H.P., conducted the desktop-level analysis, oversaw the field reconnaissance survey, and authored the built environment study. SWCA Senior Team Lead, Liz Denniston, M.A., Registered Professional Archaeologist (RPA), conducted the desktop-level analysis, oversaw the field reconnaissance survey, and authored the archaeological resources study. Senior Architectural Historian Debi Howell-Ardila, M.H.P., and Principal Investigator Chris Millington, M.A., RPA, provided senior technical-level review of the report. SWCA Senior Environmental Planner Bobbette Biddulph served as overall project manager and provided additional quality assurance/quality control. Figures were generated by SWCA Geographic Information System (GIS) Specialists Matthew DeFreese, B.S., and Marty Kooistra, M.A. Copies of the report are on file with SWCA's Pasadena office.

2 PROJECT LOCATION

The overall study area for the General Plan Update includes the city of Chino Hills' incorporated boundary and sphere of influence, which encompasses approximately 45 square miles in southwestern San Bernardino County (Figure 2; see Figure 1). The city is bounded by the cities of Diamond Bar and Pomona to the north, the city of Chino to the east, the city of Corona and the Fremont Canyon Nature Preserve to the south, and the cities of Yorba Linda and Brea to the west.

The study area is within the following grid units projected from the Public Land Survey System: Township 2 South, Range 9 West; Township 2 South, Range 8 West; Township 3 South, Range 9 West; Township 3 South, Range 8 West; and Township 3 South, Range 7 West, San Bernardino Baseline and Meridian, and can be found on the San Dimas, Ontario, Yorba Linda, Prado Dam, and Black Star Canyon, California, U.S. Geological Survey 7.5-minute quadrangles (Figure 3 through Figure 10).

3 PROJECT DESCRIPTION

3.1 General Plan Update Overview

The project consists of updates to the City's 2015 General Plan, which incorporates the City of Chino Hills adopted 2021–2029 Housing Element, and updates the existing Land Use, Circulation, Safety, Conservation, Parks/Recreation/Open Space, Noise and Economic Development Elements. The project also includes rezoning of the Housing Element opportunity sites to meet the City's RHNA allocations, and revisions to the City's Zoning Code and Zoning Map.

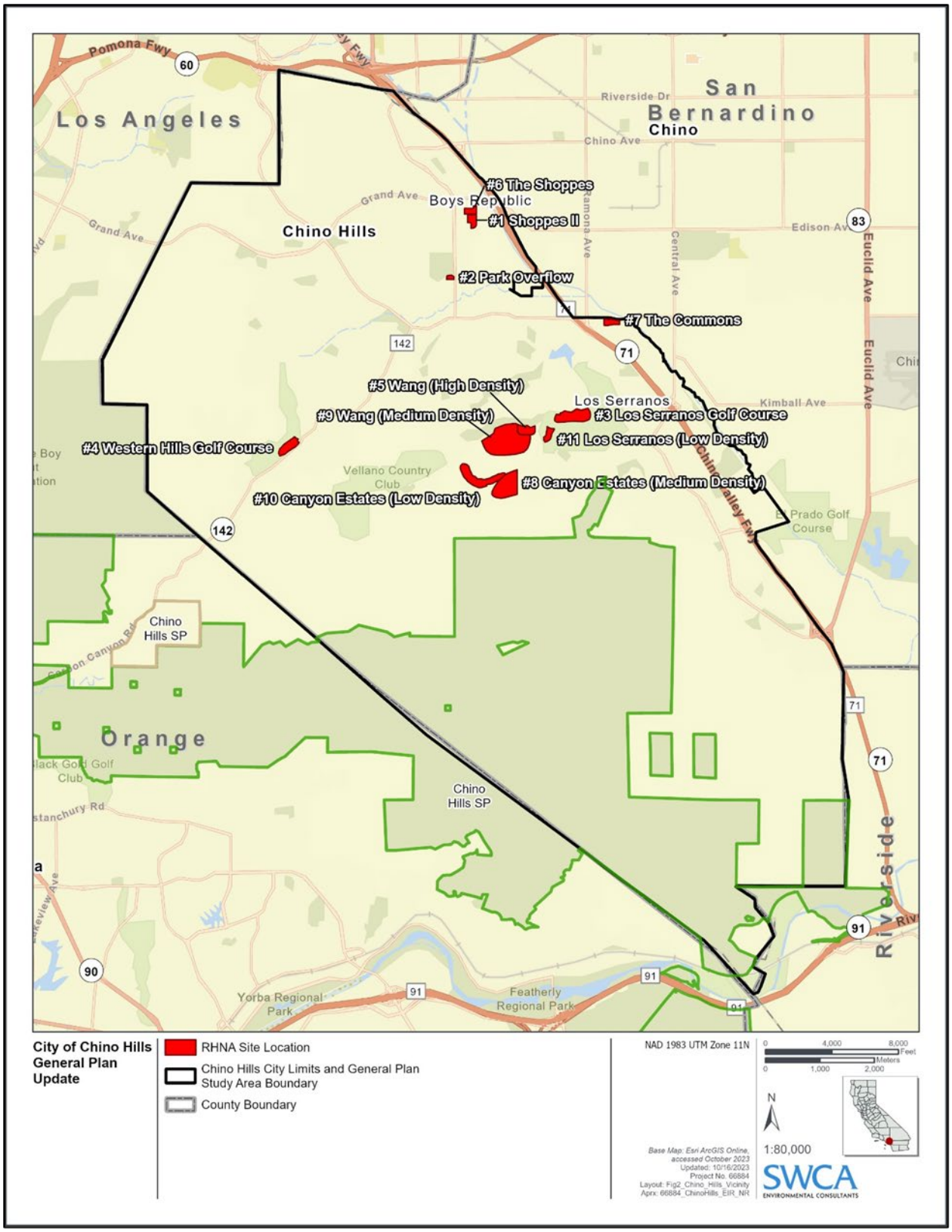


Figure 1. Project vicinity with the city limits and RHNA site locations within San Bernardino County.

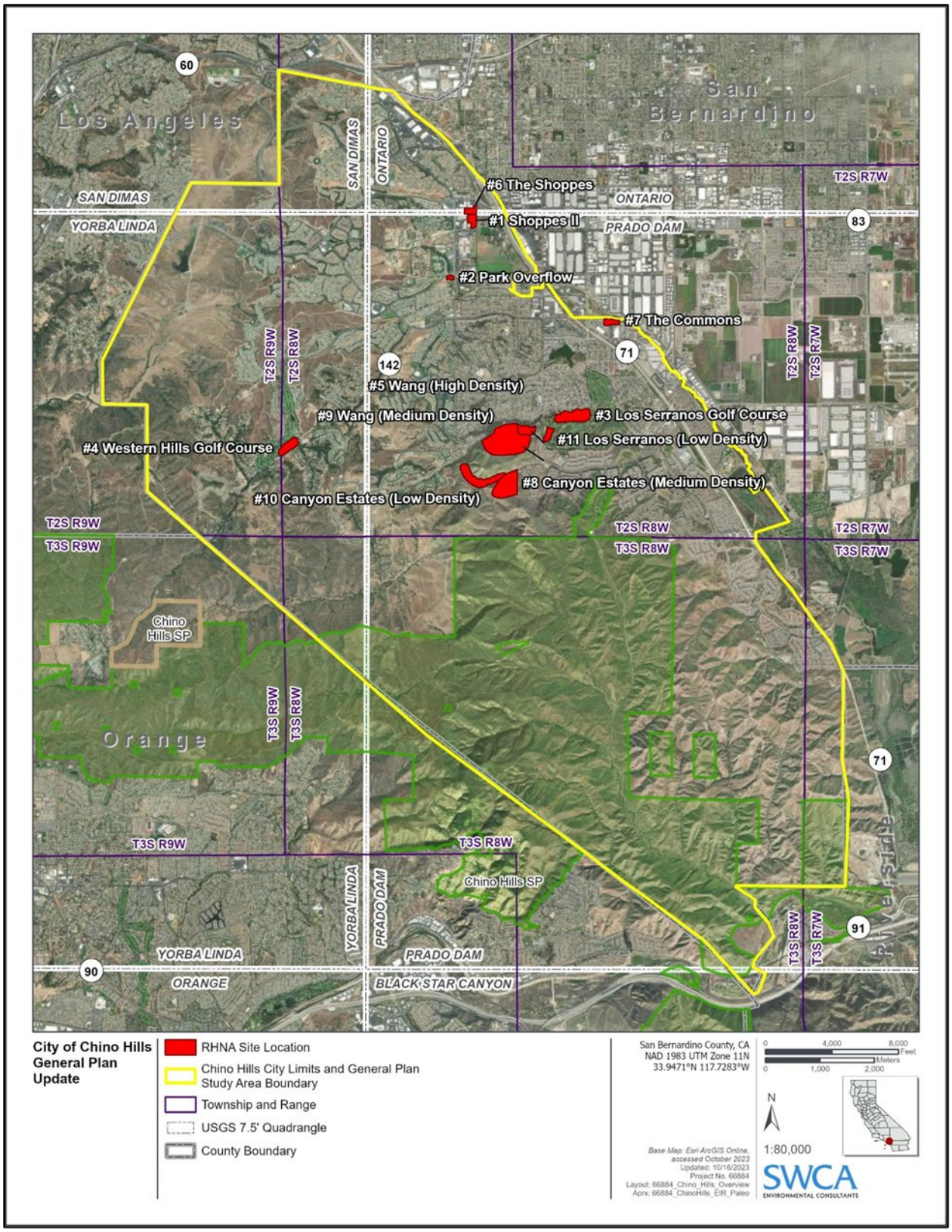


Figure 2. Project site plotted on a 2021 aerial photograph.

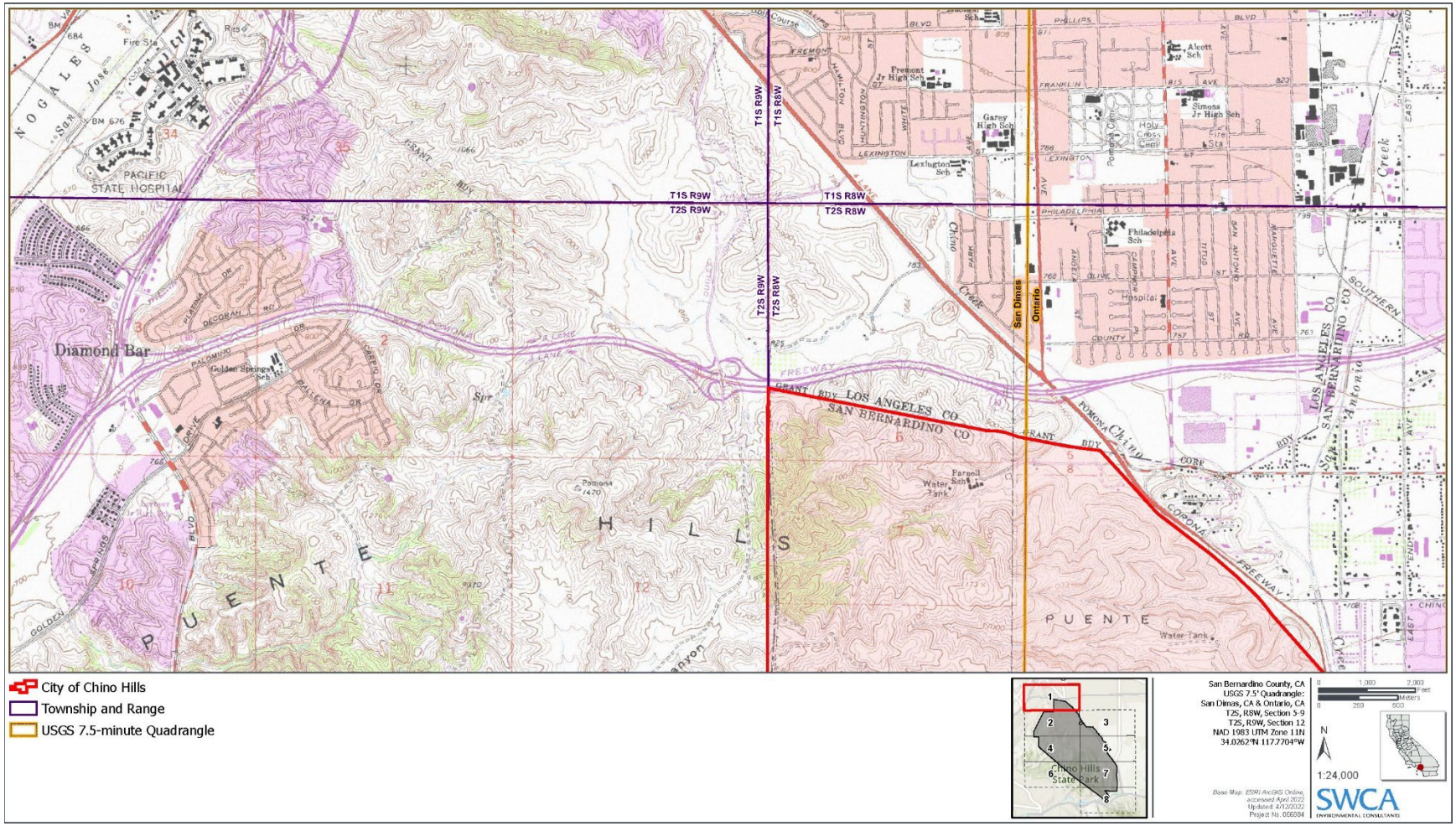


Figure 3. Project location depicted on U.S. Geological Survey quadrangles. Map 1 of 8.

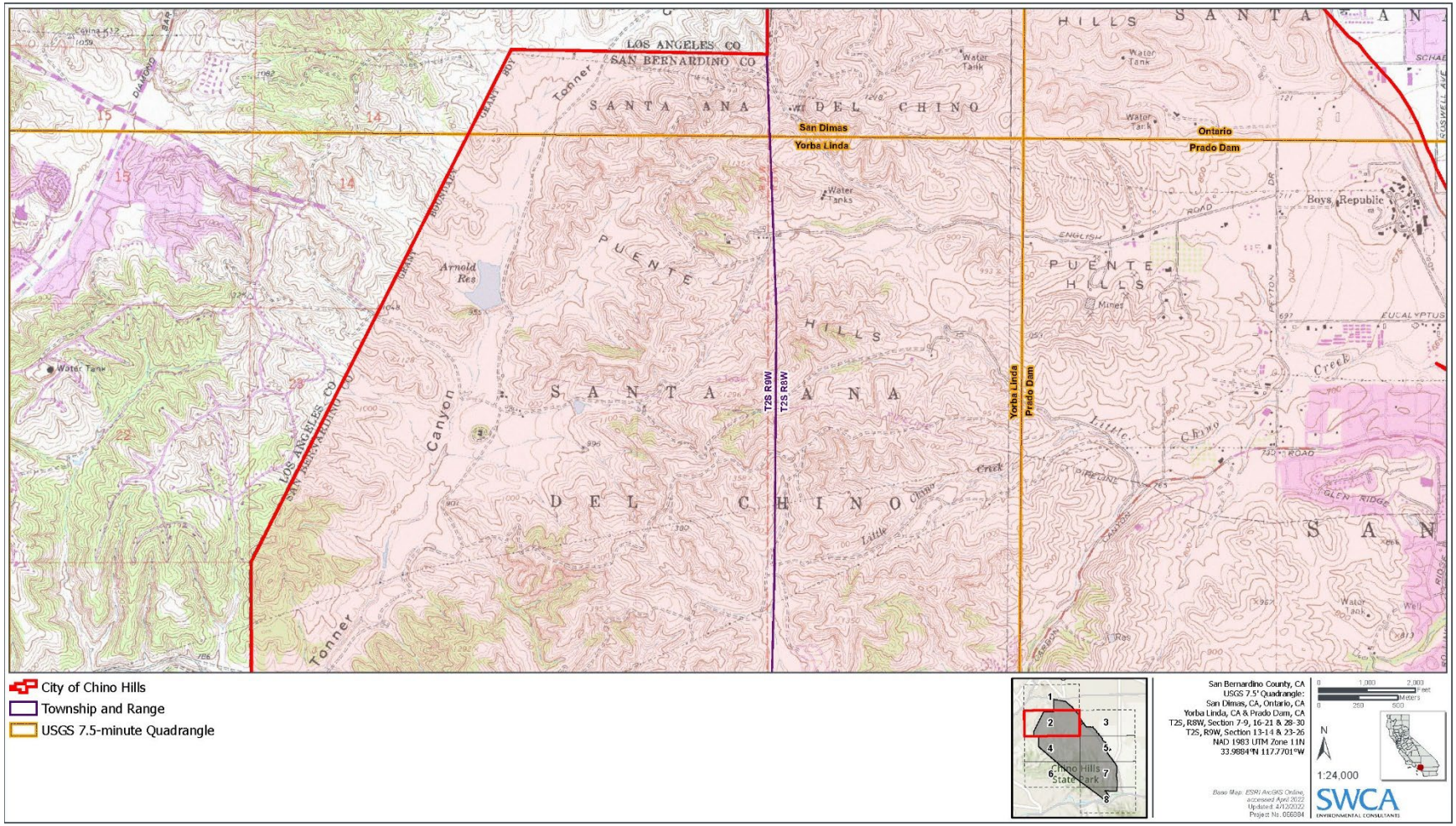


Figure 4. Project location depicted on U.S. Geological Survey quadrangles. Map 2 of 8.

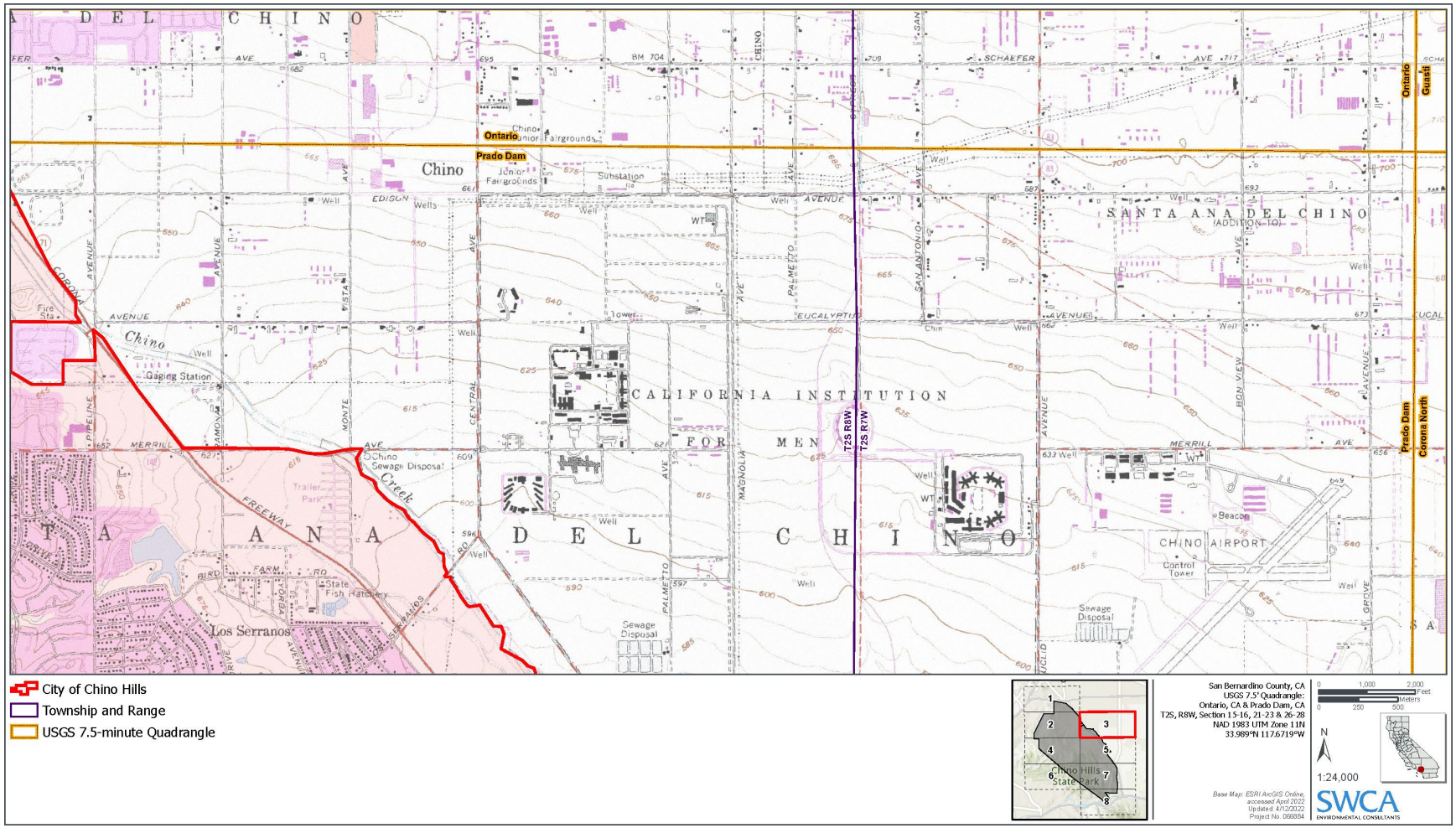


Figure 5. Project location depicted on U.S. Geological Survey quadrangles. Map 3 of 8.

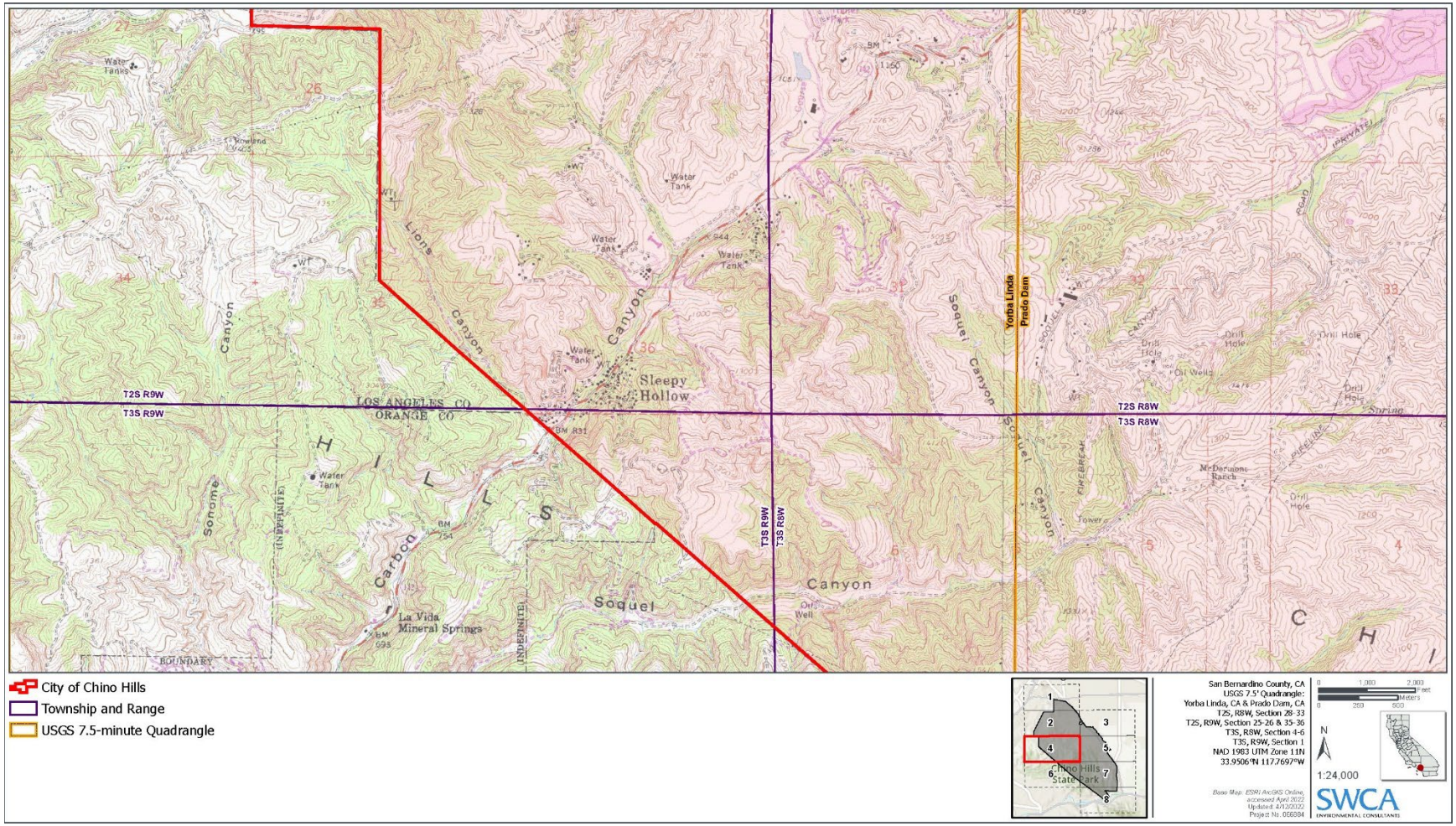


Figure 6. Project location depicted on U.S. Geological Survey quadrangles. Map 4 of 8.

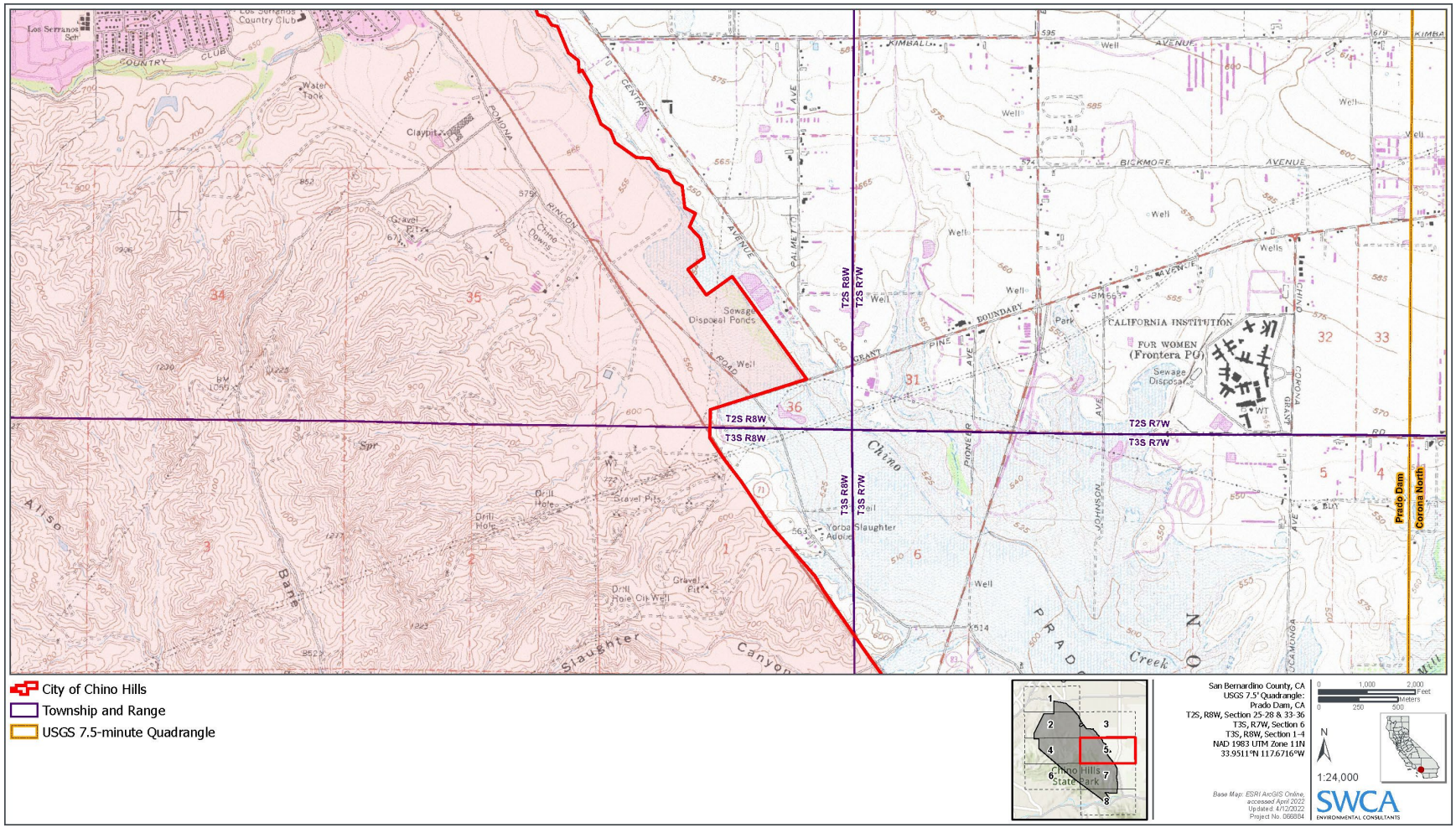


Figure 7. Project location depicted on U.S. Geological Survey quadrangles. Map 5 of 8.

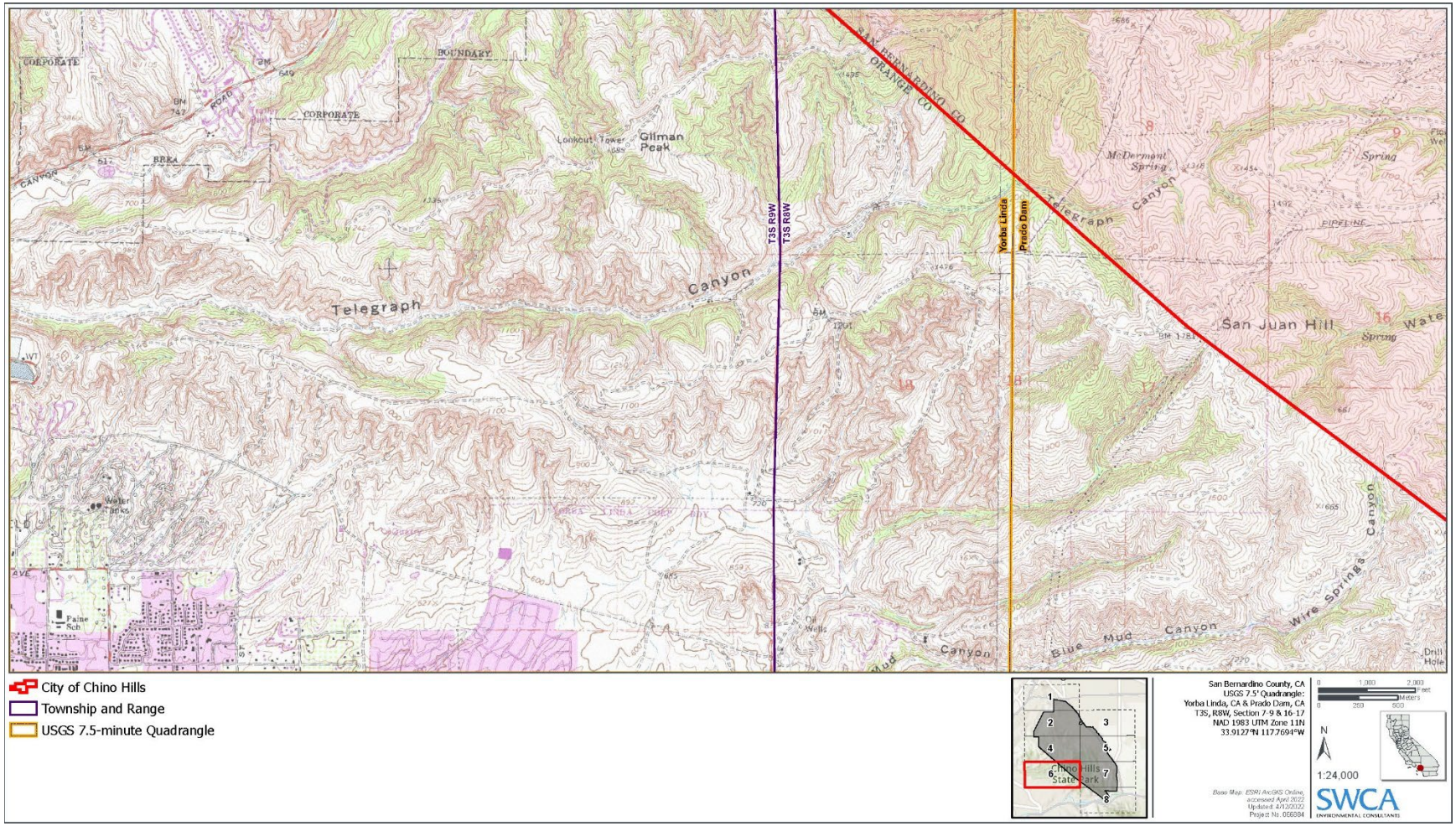


Figure 8. Project location depicted on U.S. Geological Survey quadrangles. Map 6 of 8.

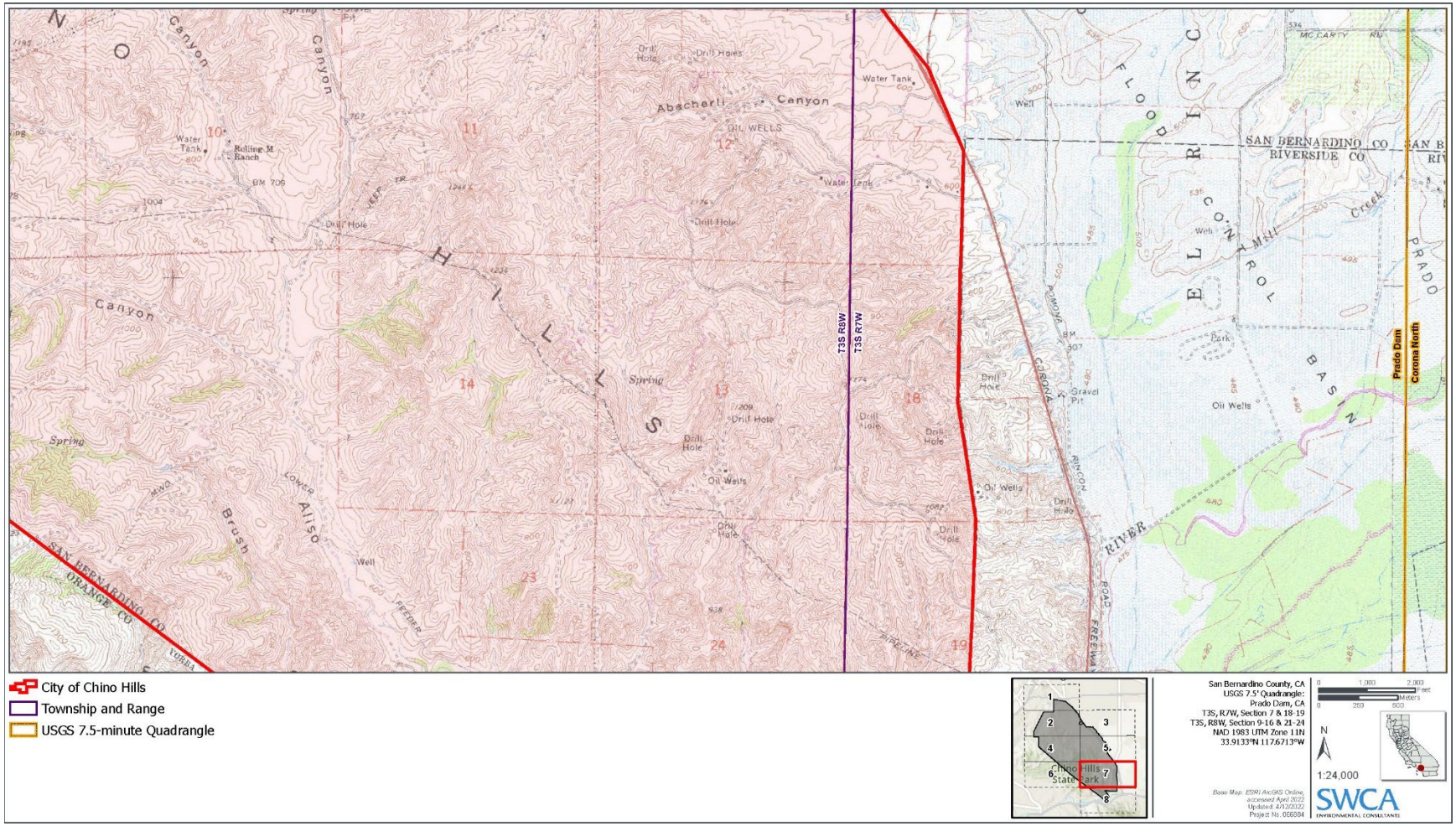


Figure 9. Project location depicted on U.S. Geological Survey quadrangles. Map 7 of 8.

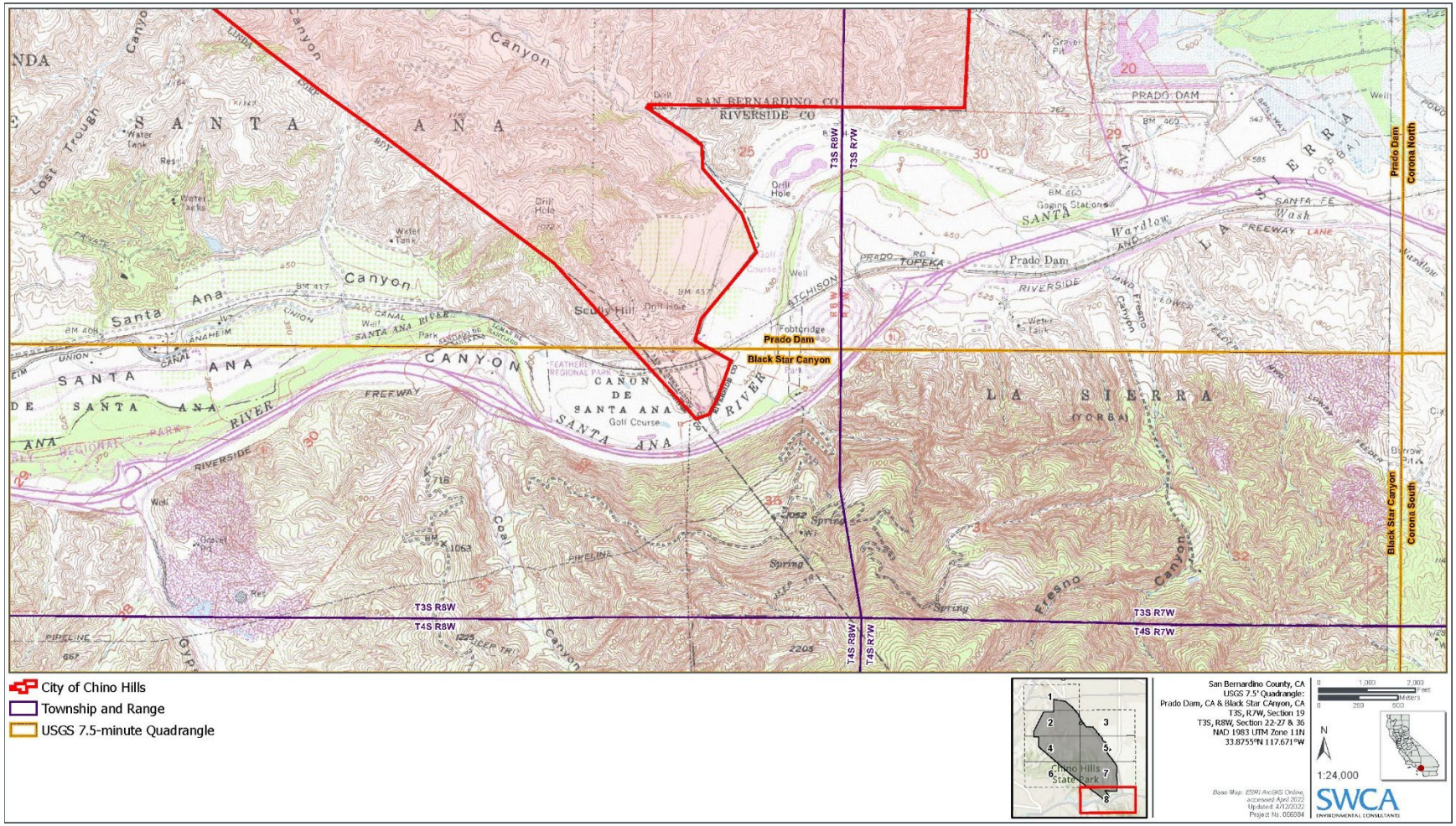


Figure 10. Project location depicted on U.S. Geological Survey quadrangles. Map 8 of 8.

3.2 Housing Element, RHNA Sites, and Related Project Actions

The Housing Element is one of the seven mandated elements of the General Plan. State law requires that all cities adopt a Housing Element and describes in detail the necessary contents of the Housing Element. This Housing Element responds to those requirements within the context of the physical and socio-economic conditions unique to the City and covers the eight-year planning cycle from 2021–2029, identified by the state as the 6th Cycle Housing Element. A major component of the Housing Element is the identification of sites for future housing development and evaluation of the adequacy of these sites for fulfilling the City's fair share of regional housing needs, which is based on the Southern California Association of Governments' RHNA. The RHNA represents the minimum number of housing units for which each community is required to provide "adequate sites" through planning and zoning and is one of the primary threshold criteria necessary to achieve California Department of Housing and Community Development Department approval of the Housing Element.

The City plans to fulfill its share of regional housing needs by using a combination of current project entitlements or applications for sites currently zoned for residential development, increasing density on property currently zoned for residential development, and rezoning of vacant and underutilized non-residential properties to allow for residential or mixed-use development.

The City's total RHNA for the 2021–2029 planning period is 3,729 units, allocated to specific income levels (2,209 units classified as Extremely Low/Very Low/Low, 789 units classified as Moderate, and 814 units classified as Above Moderate). Because the City does not have sufficient zoned sites to accommodate its full 789-unit "Moderate" income allocation and its full 2,209-unit "Lower" income allocation, there is a shortfall requiring a program to rezone additional sites. The City has identified 11 RHNA sites within its boundaries that could have the potential for new residential development within the eight-year timeframe of this planning period.

As part of the project, the Land Use Element of the General Plan would be updated to reflect new opportunity sites to meet the RHNA allocation as identified in the Housing Element. This would include four new land use categories: Low Density Housing Overlay, Medium Density Housing Overlay, Very High Density Housing Overlay, and Mixed Use Housing Overlay. These new residential categories would accommodate the RHNA allocation and would include rezoning seven sites to Very High Density Housing Overlay or Mixed Use Housing Overlay or equivalent to provide the necessary very high density sites to accommodate units affordable to lower-income households; two properties to Medium Density Housing Overlay or equivalent to provide medium density sites to accommodate units affordable to moderate- income households; and two properties to Low Density Housing Overlay. Lower income sites that require rezoning, new land use categories, and/or land use designation adjustments include:

> **Site 1 – The Shoppes II:** This site is City owned and zoned for high-density residential use. The current specific plan caps the site at 295 units; therefore, the site would need to be rezoned to increase the unit cap amount to meet the Housing Element. The small southern portion of the Shoppes II site was included in previous RHNA cycles and remained vacant. The site is flat and situated between the existing Shoppes commercial center to the north, Chino Valley Fire District Station 62 to the south, City Hall and parking structure to the west, and Boys Republic to the east. The entire site will be rezoned to Mixed Use Housing Overlay.
>
> **Site 2 – Community Park Overflow:** The site is City owned and was intended to accommodate overflow parking for the Community Park; however, the site is vacant and

underutilized. The City has focused this site on an affordable senior housing development for several years and committed to applying its Housing In-Lieu fee and available funds to help finance the development of this site. The site is located between Community Park to the north and west, and single-family residential development to the east and south. The site will be rezoned to Very High Density Housing Overlay.

Site 3 – Los Serranos Golf Course: This site is privately owned and consists of a 9-hole area of an existing 36-hole golf course. The golf course is surrounded by single-family residential development which serves local and regional communities and includes a driving range and country club. The golf course has been underperforming in recent years, and the property owner has been actively pursuing converting the southernmost 9-hole area into housing. Although the property is larger than 10 acres, the project would include a parcel map with entitlements to subdivide into a smaller parcel of adequate size to accommodate high density for lower income RHNA. The high density portion of this property would be rezoned to Very High Density Housing Overlay to allow for owner-occupied and rental multifamily uses by-right.

Site 4 – Western Hills Golf Course: This site is privately owned and consists of an 18-hole golf course established in the early 1960s to serve the local and regional communities and includes a country club. The golf course is located within Carbon Canyon and is surrounded by single-family residential development. In recent years, the golf course has underperformed, and the owner seeks to redevelop the south section of the golf course (which includes clubhouse, parking, and large open grass areas) to residential development and redesign the balance of the golf course for continued golf use. Although the golf course is larger than 10 acres, the project would include a parcel map with entitlements to subdivide into a smaller parcel of adequate size to accommodate high density for lower income RHNA. The designated housing portion of the site will be rezoned to Very High Density Housing Overlay.

Site 5 – Wang (High Density): The site is privately owned and is a vacant, residentially zoned property surrounded by single-family residential to the north and west, vacant property to the south, and Los Serranos Golf Course to the east. Although the site contains areas of steep topography, the mild slope portions can accommodate development for high-density residential. Development of this site would realign Woodview Road to enhance public safety and traffic circulation. Although the property is larger than 10 acres, the project would include a parcel map with entitlements to subdivide into a smaller parcel of adequate size to accommodate high density for lower income RHNA. The designated very high density residential portion of the site will be rezoned to Very High Density Housing Overlay.

Site 6 – The Shoppes: The site is privately owned and consists of an existing 391,863-square foot commercial center surrounded by the Shoppes II site and City Hall to the south, Boys Republic to the east, commercial center and single-family residential to the west, and commercial center to the north. The property owner intends to redevelop the underutilized southeastern section of the commercial center to a mixed-use development that would retain retail space and include high-density residential. Although the commercial center is larger than 10 acres, the project would include a parcel map with entitlements to subdivide into a smaller parcel of adequate size to accommodate high density for lower income RHNA. The designated housing portion of the site will be rezoned to Mixed Use Housing Overlay.

Site 7 – The Commons: The site is privately owned and consists of an existing 443,272-square foot commercial center surrounded by a mobile home park to the east,

single-family and multi-family residential to the west, an existing commercial center to the south, and vacant land to the north, across Chino Hills Parkway. The Chino Hills city limits is contiguous with Chino Hills Parkway directly north of the Commons site. The vacant parcel to the north of Chino Hills Parkway is within the city limits of Chino and is currently zoned for commercial office uses. The property owner intends to redevelop the underutilized portion of the commercial center by developing a mixed-use project to retain retail square footage and include high-density residential. Although the commercial center is larger than 10 acres, the project would include a parcel map with entitlements to subdivide into a smaller parcel of adequate size to accommodate high density for lower income RHNA. The designated housing portion of the site will be rezoned to Mixed Use Housing Overlay.

Moderate-income sites requiring rezoning, new land use categories, and/or land use designation adjustments include:

Site 8 – Canyon Estates (Medium Density): The site is privately owned and located at the terminus of Soquel Canyon Parkway and is surrounded by single-family residential and the vacant Wang site to the north, single-family residential to the west and east, and Chino Hills State Park to the south. City staff worked closely with the property owner and developer to evaluate the site and determine a feasible location to accommodate medium density development. Development of the property would also include key infrastructure as part of the City's circulation element. The designated medium density housing portion of the site will be rezoned to Medium Density Housing Overlay.

Site 9 – Wang (Medium Density): The site is privately owned and consists of a vacant residentially zoned property surrounded by single-family residential to the north and west, vacant property to the south, and Los Serranos Golf Course to the east. Although the site contains areas of steep topography, the mild slope portions can accommodate development for high density residential. City staff worked closely with the property owner and developer to evaluate the site and determine a feasible location to accommodate high density development. Development of this site would re-align Woodview Road to enhance public safety and traffic circulation. The designated medium density housing portion of the site will be rezoned to Medium Density Housing Overlay.

Low density sites requiring rezoning, new land use categories, and/or land use designation adjustments include:

Site 10 – Canyon Estates (Low Density): The Canyon Estates property is located at the terminus of Soquel Canyon Parkway and is surrounded by single-family residential and the vacant Wang site to the north, single-family residential to the west and east, and Chino Hills State Park to the south. The site includes steep topography on the north and south sections of the property and centered with slopes less than ten percent where development can occur. City staff worked closely with the property owner and developer to evaluate the site and determine a feasible location to accommodate medium density development. Development of the property would also include key infrastructure as part of the City's circulation element. An approximate 31-acre portion of the site would be designated for low density residential with an anticipated density of 6.0 dwelling units per acre.

Site 11 – Los Serranos Golf Course (Low Density): The Los Serranos Golf Course site is approximately 79.9 acres and part of a 9-hole area of an existing 36-hole golf course, zoned for commercial recreation, and owned by Greening Family LLC. The golf course is surrounded by single-family residential development which serves local and regional

communities and includes a driving range and country club. The golf course has been underperforming in recent years and the property owner has been actively pursuing converting the southernmost 9-hole area into housing, which is located southeast of Country Club Drive and Pipeline Avenue. An approximate 6.9-acre portion of the site would be designated for low density residential with an anticipated density of 6.0 dwelling units per acre.

In addition to the broader General Plan Update study area and two properties designated to low density residential use, nine RHNA sites are considered in this technical analysis at a greater level of detail to facilitate development of the sites to meet the City's share of regional housing needs. Seven of the nine RHNA sites contain undeveloped land, so an archaeological survey was completed. The two remaining sites (The Shoppes and The Commons) are fully developed, so archaeological pedestrian survey was not warranted. The remaining two sites are fully developed, so pedestrian survey was not warranted.

4 REGULATORY FRAMEWORK

A complex network of federal, state, and local regulations governs the cultural resources of California. This section is intended as an overview of these regulations rather than an in-depth review. This section reviews the federal, state, and local regulations and policies that may be pertinent to the update of the City's General Plan.

4.1 Federal

4.1.1 *National Historic Preservation Act of 1966*

Enacted in 1966 and amended most recently in 2014, the National Historic Preservation Act (NHPA; 54 United States Code [USC] 300101 et seq.) instituted a multifaceted program, administered by the Secretary of the Interior, to encourage sound preservation policies of the nation's cultural resources at the federal, state, and local levels. The NHPA authorized the expansion and maintenance of the National Register of Historic Places (NRHP), established the position of State Historic Preservation Officer, and provided for the designation of State Review Boards. The NHPA also set up a mechanism to certify local governments to carry out the goals of the NHPA, assisted Native American tribes to preserve their cultural heritage, and created the Advisory Council on Historic Preservation.

4.1.2 *National Register of Historic Places*

The NRHP was established by the NPHA as "an authoritative guide to be used by Federal, State, and local governments, private groups and citizens to identify the Nation's cultural resources and to indicate what properties should be considered for protection from destruction or impairment" (36 Code of Federal Regulations [CFR] 60.2). The NRHP recognizes properties that are significant at the national, state, and local levels. To be eligible for the NRHP, a property must be significant in American history, architecture, archaeology, engineering, or culture under one or more of the following criteria (36 CFR 60.4):

- **Criterion A:** It is associated with events that have made a significant contribution to the broad patterns of our history;
- **Criterion B:** It is associated with the lives of persons who are significant in our past;
- **Criterion C:** It embodies the distinctive characteristics of a type, period, or method of construction, or represents the work of a master, or possesses high artistic values, or

represents a significant and distinguishable entity whose components may lack individual distinction; and/or

- **Criterion D:** It has yielded, or may be likely to yield, information important in prehistory or history.

Ordinarily cemeteries, birthplaces or graves of historic figures, properties owned by religious institutions or used for religious purposes, structures that have been moved from their original locations, reconstructed historic buildings, and properties that are primarily commemorative in nature are not considered eligible for the NRHP, unless they satisfy certain conditions. In general, a resource must be 50 years of age to be considered for the NRHP, unless it satisfies a standard of exceptional importance.

Integrity

In addition to meeting these criteria, a property must also retain historic integrity, which is defined in National Register Bulletin 15 as the ability of a property to convey its significance (National Park Service 1995). To assess integrity, the National Park Service recognizes seven aspects or qualities that, considered together, define historic integrity. To retain integrity, a property must possess several, if not all, of these seven qualities:

1. Location – the place where the historic property was constructed or the place where the historic event occurred
2. Design – the combination of elements that create the form, plan, space, structure, and style of a property
3. Setting – the physical environment of a historic property
4. Materials – the physical elements that were combined or deposited during a particular period of time and in a particular pattern or configuration to form a historic property
5. Workmanship – the physical evidence of the crafts of a particular culture or people during any given period in history or prehistory
6. Feeling – a property's expression of the aesthetic or historic sense of a particular period of time
7. Association – the direct link between an important historic event or person and a historic property

4.1.3 *Native American Graves Protection and Repatriation Act*

The Native American Graves Protection and Repatriation Act (NAGPRA) of 1990 (25 USC 3001 et seq.) protects human remains, funerary objects, sacred objects, and items of cultural patrimony of Indigenous peoples on federal lands. NAGPRA stipulates priorities for assigning ownership or control of such cultural items excavated or discovered on federal or Tribal lands, or in the possession and control of an agency that has received federal funding.

NAGPRA also provides for the repatriation of human remains and associated items previously collected from federal lands and in the possession or control of a federal agency or federally funded repository. Implementing regulations are codified in 43 CFR Part 10. In addition to defining procedures for dealing with previously collected human remains and associated items, these regulations outline procedures for

negotiating plans of action or comprehensive agreements for treatment of human remains and associated items encountered in intentional excavations, or inadvertent discoveries on federal or Tribal lands.

4.2 State

The California Office of Historic Preservation (OHP), a division of the California Department of Parks and Recreation, is responsible for carrying out the duties described in the California Public Resources Code (PRC) and for maintaining the California Historic Resources Inventory and California Register of Historical Resources (CRHR). The state-level regulatory framework also includes CEQA, which requires the identification and mitigation of substantial adverse impacts that may affect the significance of eligible historical and archaeological resources.

4.2.1 *California Environmental Quality Act*

CEQA requires a lead agency to analyze whether historic and/or archaeological resources may be adversely impacted by a proposed project. Under CEQA, a "project that may cause a substantial adverse change in the significance of a historic resource is a project that may have a significant effect on the environment" (PRC Section 21084.1). Analysis is a two-part process: first, a determination must be made whether historical resources are present in the project area. Second, if such resources are present, the proposed project must be analyzed for its potential to cause a "substantial adverse change in the significance" of the resources.

4.2.1.1 HISTORICAL RESOURCES

According to the CEQA Guidelines, California Code of Regulations (CCR) Section 15064.5, for the purposes of CEQA, historical resources are:

1. A resource listed in, or formally determined eligible . . . for listing in the CRHR (PRC Section 5024.1, 14 CCR 4850 et seq.).

2. A resource included in a local register of historical resources, as defined in PRC Section 5020.1(k) or identified as significant in a historic resources survey meeting the requirements of PRC Section 5024.1(g).

3. Any object, building, structure, site, area, place, record, or manuscript that the lead agency determines to be eligible for national, state, or local landmark listing; generally, a resource shall be considered by the lead agency to be historically significant (and therefore a historic resource under CEQA) if the resource meets the criteria for listing on the CRHR (as defined in PRC Section 5024.1, 14 CCR 4852).

Resources nominated to the CRHR must retain enough of their historic character or appearance to convey the reasons for their significance. Resources whose historic integrity (as defined above) does not meet NRHP criteria may still be eligible for the CRHR.

According to CEQA, the fact that a resource is not listed in or determined eligible for the CRHR or is not included in a local register or survey shall not preclude the lead agency from determining that the resource may be a historical resource (PRC 5024.1). Pursuant to CEQA, a project with an effect that may cause a substantial adverse change in the significance of a historical resource may have a significant effect on the environment (CEQA Guidelines, 14 CCR 15064.5[b]).

4.2.1.2 ARCHAEOLOGICAL RESOURCES

In terms of archaeological resources, PRC Section 21083.2(g) defines a unique archaeological resource as an archaeological artifact, object, or site about which it can be clearly demonstrated that without merely adding to the current body of knowledge, there is a high probability that it meets any of the following criteria:

1. Contains information needed to answer important scientific research questions and that there is a demonstrable public interest in that information.

2. Has a special and particular quality such as being the oldest of its type or the best available example of its type.

3. Is directly associated with a scientifically recognized important prehistoric or historic event or person.

If it can be demonstrated that a proposed project will cause damage to a unique archaeological resource, the lead agency may require that reasonable efforts be made to permit any or all of these resources to be preserved in place or left in an undisturbed state. To the extent that they cannot be left undisturbed, mitigation measures are required (PRC 21083.2[a]–[c]). CEQA notes that if an archaeological resource is neither a unique archaeological resource nor a historical resource, the effects of the project on those resources shall not be considered to be a significant effect on the environment (CEQA Guidelines, 14 CCR 15064.5[c][4]).

4.2.1.3 CALIFORNIA STATE SENATE BILL 18

Signed into law in 2004, Senate Bill (SB) 18 requires that cities and counties notify and consult with California Native American tribes about proposed local land use planning decisions for the purpose of protecting traditional Tribal cultural sites. Cities and counties must provide general and specific plan amendment proposals to California Native American tribes that have been identified by the NAHC as having traditional lands within the city's boundaries. If requested by the Native American tribes, the City must also conduct consultations with the Tribes prior to adopting or amending their general and specific plans.

4.2.1.4 CALIFORNIA STATE ASSEMBLY BILL 52

Assembly Bill 52 of 2014 (AB 52) amended PRC Section 5097.94 and added PRC Sections 21073, 21074, 21080.3.1, 21080.3.2, 21082.3, 21083.09, 21084.2, and 21084.3. Section 4 of AB 52 adds Section 21074(a)(b)(c) to the PRC, which address Tribal cultural resources, cultural landscapes, and historical resources.

Tribal Cultural Resources

PRC Section 21074(a) defines Tribal cultural resources as one of the following:

(1) Sites, features, places, cultural landscapes, sacred places, and objects with cultural value to a California Native American tribe that are either of the following:

   A. Included or determined to be eligible for inclusion in the California Register of Historical Resources.

   B. Included in a local register of historical resources as defined in subdivision (k) of Section 5020.1.

(2) A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Section 5024.1. In applying the criteria set forth in subdivision (c) of Section 5024.1 for the purposes of this paragraph, the lead agency shall consider the significance of the resource to a California Native American tribe.

Additionally, PRC Section 21074(b) and (c) include in the definition of a Tribal cultural resource the following:

(3) A cultural landscape that meets the criteria of subdivision (s)…to the extent that the landscape is geographically defined in terms of the size and scope of the landscape (PRC Section 21074 [b])

(4) A historical resource described in Section 21084.1, a unique archaeological resource as defined in subdivision (g) of Section 21083.2, or a "nonunique archaeological resource" as defined in subdivision (h) of Section 21083.2…if it conforms with the criteria of subdivision (a) (PRC Section 21074 [c]).

Impacts to Tribal cultural resources should be considered under CEQA. PRC Section 21080.3.2 states that parties may propose mitigation measures "capable of avoiding or substantially lessening potential significant impacts to a tribal cultural resource or alternatives that would avoid significant impacts to a tribal cultural resource." Further, if a California Native American tribe requests consultation regarding project alternatives, mitigation measures, or significant effects to Tribal cultural resources, the consultation shall include those topics (PRC Section 21080.3.2[a]). The environmental document and the mitigation monitoring and reporting program (where applicable) shall include any mitigation measures that are adopted (PRC Section 21082.3[a]).

Consultation with Native Americans

California Native American tribes are defined in AB 52 as any Native American tribe located in California that is on the contact list maintained by the NAHC, whether or not they are federally recognized. AB 52 specifies that California Native American tribes traditionally and culturally affiliated with a geographic area may have expertise concerning their Tribal cultural resources. Once an application for a project is completed or a public agency makes a decision to undertake a project, the lead agency has 14 days to send formal notification to Native American tribes designated by the NAHC as having traditional and cultural affiliation with a given project area and that had previously requested in writing to be notified by the lead agency (PRC Section 21082.3.1[b][d]). The notification shall include a brief description of the proposed project, the location, contract information for the agency contact, and notice that the Tribe has 30 days to request, in writing, consultation (PRC Section 21082.3.1[d]). Consultation must be initiated by the lead agency within 30 days of receiving any California Native American tribe's request for consultation. Furthermore, consultation must be initiated prior to the release of a negative declaration, mitigated negative declaration, or EIR for a project (PRC Section 21082.3.1[b][e]).

Consultation may include discussion concerning the type of environmental review necessary, the significance of the project's impacts on the Tribal cultural resources, and, if necessary, project alternatives or the appropriate measures for preservation and mitigation that the California Native American tribe may recommend to the lead agency. The consultation shall be considered concluded when either the parties agree to measures to mitigate or avoid a significant effect, if one exists, on a Tribal cultural resource; or a party, acting in good faith and after reasonable effort, concludes that mutual agreement cannot be reached (PRC Section 21082.3.2[b]).

Pursuant to Government Code Sections 6254 and 6254.10, and PRC Section 21082.3(c), information submitted by a California Native American tribe during consultation under AB 52 shall not be included in the environmental document or otherwise disclosed to the public by the lead agency, project applicant, or

the project applicant's agent, unless written permission is given. Exemptions to the confidentiality provisions include any information already publicly available, in lawful possession of the project applicant before being provided by the Tribe, independently developed by the project applicant or the applicant's public agent, or lawfully obtained by a third party (PRC Section 21082.3[c]).

4.2.2 California Register of Historical Resources

Created in 1992 and implemented in 1998, the CRHR is "an authoritative guide in California to be used by state and local agencies, private groups, and citizens to identify the state's historical resources and to indicate what properties are to be protected, to the extent prudent and feasible, from substantial adverse change" (PRC Sections 21083.2 and 21084.1). Certain properties, including those listed in or formally determined eligible for the NRHP and California Historical Landmarks numbered 770 and higher, are automatically included in the CRHR. Other properties recognized under the California Points of Historical Interest program, identified as significant in historical resources surveys, or designated by local landmarks programs may be nominated for listing in the CRHR. According to PRC Section 5024.1(c), a resource, either an individual property or a contributor to a historic district, may be listed in the CRHR if the State Historical Resources Commission determines that it meets one or more of the following criteria, which are modeled on NRHP criteria:

- **Criterion 1:** It is associated with events that have made a significant contribution to the broad patterns of local or regional history or the cultural heritage of California or the United States.
- **Criterion 2:** It is associated with the lives of persons important to local, California or national history.
- **Criterion 3:** It embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of a master, or possesses high artistic values.
- **Criterion 4:** It has yielded, or has the potential to yield, information important to the prehistory or history of the local area, California or the nation.

Resources nominated for the CRHR must retain enough of their historic character or appearance to convey the reasons for their significance. Resources whose historic integrity does not meet NRHP criteria may still be eligible for the CRHR.

4.2.3 Treatment of Human Remains

The disposition of burials falls first under the general prohibition on disturbing or removing human remains under Section 7050.5 of the California Health and Safety Code (CHSC). More specifically, remains suspected to be Native American are treated under CEQA (14 CCR 15064.5); PRC Section 5097.98 illustrates the process to be followed if remains are discovered. If human remains are discovered during construction, no further disturbance to the site shall occur, and the county coroner must be notified (14 CCR 15064.5; PRC Section 5097.98).

4.3 Local

4.3.1 *City of Chino Hills General Plan*

The current Conservation Element of the Chino Hills General Plan (adopted February 24, 2015) provides general guidance for the protection of cultural resources within the city. Below are the relevant goal and related policies concerning cultural resources:

Goal CN-2: Protect Chino Hills' Cultural Resources

Policy CN-2.1: Protect Chino Hills' archaeological resources

Action CN-2.1.1: Require appropriate archaeological surveys as part of the environmental review process where archaeological resources may be present.

Action CN-2.1.2: Require on-site inspections by a qualified archaeologist during grading activities where archaeological resources may be present.

Action CN-2.1.3: Where archaeological resources are found during development activities, require identified archaeological materials to be preserved, restored, cataloged, and/or transmitted to the appropriate repository or as otherwise directed by a qualified professional archaeologist.

Action CN-2.1.4: Consult with local Native American tribes as required to avoid impacts on archaeological resources.

Policy CN-2.3: Protect Chino Hills' archaeological resources

Action CN-2.3.1: Prior to a change of land use or other action on the Boys Republic property that could disturb a potential historic resource, require a historic resource survey of the property by a qualified historic resource consultant, and consider incorporating any recommendations as requirements into subsequent development approval.

Action CN-2.3.2: Prior to a change of land use or other action on the Tres Hermanos property that could disturb a potential historic resource, require a historic resource survey of the property by a qualified historic resource consultant, and consider incorporating any recommendations as requirements into subsequent development approval.

Action CN-2.3.3: Prior to grading on-site of the original clubhouse of the 1925 Los Serranos Country Club, require an appropriate archaeological survey to determine the presence of artifacts associated with the former Bridger/Gird Adobe site and consider incorporating any recommendations as requirements into subsequent development approval.

Action CN-2.3.4: Consider placement of markers to acknowledge the local importance to Chino Hills' history of the Carbon Canyon and English Road equestrian communities.

Action CN-2.3.5: For structures over 45 years old, review available City building records and make a determination regarding the structure's potential historical significance prior to permitting its demolition or substantial alteration.

The City does not have a historic preservation ordinance or specific significance criteria that must be met to designate local historical resources (Gust and Valasik 2011:36).

5 SETTING

5.1 Environmental Setting

Located in southwest San Bernardino County, the city of Chino Hills covers a land area of 44.7 square miles (U.S. Census Bureau 2022). Its landscape includes hillsides, canyons, ridges, streams, and floodplains (City of Chino Hills 2015a). Elevations range between approximately 500 feet (152 m) and 1,600 feet (488 m) above mean sea level (Glenn Lukos Associates 2010). The city is situated within the eastern Puente-Chino Hills, which are at the northern end of the Peninsular Ranges geomorphic province, and are bound by the San Gabriel Valley to the northwest, the San Bernardino Valley to the northeast, and by the Santa Ana River Canyon and Los Angeles Basin to the south (Glenn Lukos Associates 2010). The city consists primarily of a mix of agricultural, residential, commercial, office, and institutional uses, with state park lands occupying much of the southern portion of the city.

Geological maps of the San Dimas and Ontario Quadrangles indicate the city is located primarily on the Monterey Formation in the northwestern half of the city, and primarily on the Sycamore Canyon Formation in the southeastern half. Quaternary alluvial deposits dating to the Pleistocene Epoch are mapped primarily at the northwestern and northeastern edges of the city at areas of creeks and canyons (Dibblee and Minch 2002, 2010). A paleontological analysis was completed by Carson et al. (2022).

The regional climate is characterized by warm summers, mild winters, and infrequent rainfall. The normal daily minimum temperature ranges from 5 degrees Celsius (C) (41 degrees Fahrenheit [F]) in December to 17 degrees C (62 degrees F) in August. The normal daily maximum temperature ranges from 20 degrees C (67 degrees F) in December to 34 degrees C (93 degrees F) in August. The region averages approximately 39 cm (15.4 inches) of precipitation annually (Sperlings BestPlaces 2022).

5.2 Cultural Setting

5.2.1 *Prehistoric Overview*

Numerous chronological sequences have been devised to aid in understanding cultural changes in southern California. Building on early studies and focusing on data synthesis, Wallace (1955, 1978) developed a prehistoric chronology for the southern California coastal region that is still widely used today and is applicable to near-coastal and many inland areas. Four periods are presented in Wallace's prehistoric sequence: Early Man, Milling Stone, Intermediate, and Late Prehistoric. Although Wallace's (1955) synthesis initially lacked chronological precision due to a paucity of absolute dates (Moratto 1984), this situation has been alleviated by the availability of thousands of radiocarbon dates that have been obtained by southern California researchers in the last three decades (Byrd and Raab 2007:217). Several revisions have been made to Wallace's (1955) synthesis using radiocarbon dates and projectile point assemblages (e.g., Koerper and Drover 1983; Koerper et al. 2002; Mason and Peterson 1994).

5.2.2 *Horizon I (Early Man) (ca. 10,000–6000 B.C.)*

When Wallace defined the Horizon I (Early Man) period in the mid-1950s, there was little evidence of human presence on the southern California coast prior to 6000 B.C. Archaeological work in the intervening years has identified numerous pre–8000 B.C. sites, both on the mainland coast and the Channel Islands (e.g., Erlandson 1991; Johnson et al. 2002; Moratto 1984). The earliest accepted dates for occupation are from two of the northern Channel Islands, located off the coast of Santa Barbara. On San Miguel Island, Daisy Cave clearly establishes the presence of people in this area approximately 10,000 years ago (Erlandson 1991). On Santa Rosa Island, human remains have been dated from the Arlington Springs site to approximately 13,000 years ago (Johnson et al. 2002). Present-day Orange and San Diego Counties contain several sites dating to 9,000 to 10,000 years ago (Byrd and Raab 2007; Macko 1998; Mason and Peterson 1994; Sawyer and Koerper 2006). Known sites dating to the Early Man period are rare in western Riverside County. One exception is the Elsinore site (CA-RIV-2798-B), which has deposits dating as early as 6630 calibrated B.C. (Grenda 1997).

Recent data from Horizon I sites indicate that the people's economy was a mixture of hunting and gathering, with a major emphasis on aquatic resources in many coastal areas (e.g., Jones et al. 2002) and on Pleistocene lakeshores in eastern San Diego County (Moratto 1984). Although few Clovis-like or Folsom-like fluted points have been found in southern California (e.g., Dillon 2002), it is generally thought that the emphasis on hunting may have been greater during Horizon I than in later periods. Common elements in many sites from this period, for example, include leaf-shaped bifacial projectile points and knives, stemmed or shouldered projectile points, scrapers, engraving tools, and crescents (Wallace 1978). Subsistence patterns shifted around 6000 B.C. coincident with the gradual desiccation associated with the onset of the Altithermal climatic regime, a warm and dry period that lasted for approximately 3,000 years. After 6000 B.C., a greater emphasis was placed on plant foods and small animals.

5.2.3 *Horizon II (Milling Stone) (6000–3000 B.C.)*

The Milling Stone Horizon of Wallace (1955, 1978) and Encinitas Tradition of Warren (1968) (6000–3000 B.C.) are characterized by subsistence strategies centered on collecting plant foods and small animals. Food procurement activities included hunting small and large terrestrial mammals, sea mammals, and birds; collecting shellfish and other shore species; near-shore fishing with barbs or gorges; the processing of yucca and agave; and the extensive use of seed and plant products (Kowta 1969). The importance of the seed processing is apparent in the dominance of stone grinding implements in

contemporary archaeological assemblages, namely milling stones (metates and slabs) and hand stones (manos and mullers). Milling stones occur in large numbers for the first time during this period, and are more numerous near the end of this period. Recent research indicates that Milling Stone Horizon food procurement strategies varied in both time and space, reflecting divergent responses to variable coastal and inland environmental conditions (Byrd and Raab 2007).

Milling Stone Horizon sites are common in the southern California coastal region between Santa Barbara and San Diego, and at many inland locations, including the Prado Basin in western Riverside County and the Pauma Valley in northeastern San Diego County (e.g., Langenwalter and Brock 1985; Sawyer and Brock 1999; Sutton 1993; True 1958). Wallace (1955, 1978) and Warren (1968) relied on several key coastal sites to characterize the Milling Stone Horizon and Encinitas Tradition, respectively. These include the Oak Grove Complex in the Santa Barbara region, Little Sycamore in southwestern Ventura County, Topanga Canyon in the Santa Monica Mountains, and La Jolla in San Diego County. The well-known Irvine site (CA-ORA-64) has occupation levels dating between ca. 6000 and 4000 B.C. (Drover et al. 1983; Macko 1998).

Stone chopping, scraping, and cutting tools made from locally available raw material are abundant in Milling Stone/Encinitas deposits. Less common are projectile points, which are typically large and leaf shaped, and bone tools such as awls. Items made from shell, including beads, pendants, and abalone dishes, are generally rare. Evidence of weaving or basketry is present at a few sites. Kowta (1969) attributes the presence of numerous scraper-planes in Milling Stone sites to the preparation of agave or yucca for food or fiber. The mortar and pestle, associated with pounding foods such as acorns, were first used during the Milling Stone Horizon (Wallace 1955, 1978; Warren 1968).

Characteristic mortuary practices of the Milling Stone Horizon or Encinitas Tradition include extended and loosely flexed burials, some with red ochre, and few grave goods such as shell beads and milling stones interred beneath cobble or milling stone cairns. “Killed” milling stones, exhibiting holes, may occur in the cairns. Reburials are common in the Los Angeles County area, with north-oriented flexed burials common in Orange and San Diego counties (Wallace 1955, 1978; Warren 1968).

5.2.4 *Horizon III (Intermediate) (3000 B.C.–A.D. 500)*

Following the Milling Stone Horizon, Wallace’s Intermediate Horizon and Warren’s Campbell Tradition in Santa Barbara, Ventura, and parts of Los Angeles Counties, date from approximately 3000 B.C. to A.D. 500 and are characterized by a shift toward a hunting and maritime subsistence strategy, along with a wider use of plant foods. The Campbell Tradition (Warren 1968) incorporates David B. Rogers’ (1939) Hunting Culture and related expressions along the Santa Barbara coast. In the San Diego region, the Encinitas Tradition (Warren 1968) and the La Jolla Culture (Moriarty 1966; Rogers 1939, 1945) persisted with little change during this time.

During the Intermediate Horizon and Campbell Tradition, there was a pronounced trend toward greater adaptation to regional or local resources. For example, an increasing variety and abundance of fish, land mammal, and sea mammal remains are found in sites along the California coast during this period. Related chipped stone tools suitable for hunting are more abundant and diversified, and shell fishhooks became part of the tool kit during this period. Larger knives, a variety of flake scrapers, and drill-like implements were common during this period. Projectile points include large side-notched, stemmed, and lanceolate or leaf-shaped forms. Koerper and Drover (1983) consider Gypsum Cave and Elko Series points, which have a wide distribution in the Great Basin and Mojave deserts between ca. 2000 B.C. and A.D. 500, to be diagnostic of this period. Bone tools, including awls, were more numerous than in the preceding period, and the use of asphaltum adhesive was common.

Mortars and pestles became more common during this period, gradually replacing manos and metates as the dominant milling equipment. Hopper mortars and stone bowls, including steatite vessels, appeared in the tool kit at this time as well. This shift appears to correlate with the diversification in subsistence resources. Many archaeologists believe this change in milling stones signals a shift away from the processing and consuming of hard seed resources to the increasing importance of the acorn (e.g., Glassow et al. 1988; True 1993). It has been argued that mortars and pestles may have been used initially to process roots (e.g., tubers, bulbs, and corms associated with marshland plants), with acorn processing beginning at a later point in prehistory (Glassow 1997) and continuing to European contact.

Characteristic mortuary practices during the Intermediate Horizon and Campbell Tradition included fully flexed burials, placed facedown or face-up, and oriented toward the north or west (Warren 1968). Red ochre was common, and abalone shell dishes were infrequent. Interments sometimes occurred beneath cairns or broken artifacts. Shell, bone, and stone ornaments, including charmstones, were more common than in the preceding Encinitas Tradition. Some later sites include *Olivella* shell and steatite beads, mortars with flat bases and flaring sides, and a few small points. The broad distribution of steatite from the Channel Islands and obsidian from distant inland regions, among other items, attest to the growth of trade, particularly during the later part of this period. Recently, Raab and others (Byrd and Raab 2007) have argued that the distribution of *Olivella* grooved rectangle beads marks "a discrete sphere of trade and interaction between the Mojave Desert and the southern Channel Islands."

5.2.5 *Horizon IV (Late Prehistoric) (A.D. 500–Historic Contact)*

In the Late Prehistoric Horizon (Wallace 1955, 1978), which lasted from the end of the Intermediate Horizon (ca. A.D. 500) until European contact, there was an increase in the use of plant food resources in addition to an increase in land and sea mammal hunting. There was a concomitant increase in the diversity and complexity of material culture during the Late Prehistoric, demonstrated by more classes of artifacts. The recovery of a greater number of small, finely chipped projectile points, usually stemless with convex or concave bases, suggests an increased usage of the bow and arrow rather than the atlatl (spear thrower) and dart for hunting. Other items include steatite cooking vessels and containers, the increased presence of smaller bone and shell circular fishhooks, perforated stones, arrow shaft straighteners made of steatite, a variety of bone tools, and personal ornaments made from shell, bone, and stone. There is also an increased use of asphalt for waterproofing and as an adhesive.

By A.D. 1000, fired clay smoking pipes and ceramic vessels were in use at some sites, but pottery was not as common in western Riverside County because it was closer to the Colorado River (Drover 1971, 1975; Meighan 1954; Warren and True 1984). The lack of widespread pottery manufacture is usually attributed to the high quality of tightly woven and watertight basketry that functioned in the same capacity as ceramic vessels. Mortuary customs were elaborate and included cremation and interment with abundant grave goods. The seemingly abrupt changes in material culture, burial practices, and subsistence focus at the beginning of the Late Prehistoric horizon are thought to be the result of a migration of Takic-speaking (or Numic) people, from eastern desert regions, toward the coast. In addition to the small triangular and triangular side-notched points similar to those found in the desert regions in the Great Basin and along the Lower Colorado River, the introduction of Colorado River–style pottery and the practice of cremation suggest a strong influence from the Colorado Desert region.

5.2.6 *Ethnographic Overview*

As depicted in Figure 11, the project site is in an area historically occupied by the Gabrielino (Bean and Smith 1978:538; Kroeber 1925: Plate 57). Surrounding Native groups included the Chumash and Tatataviam/Alliklik to the north, the Serrano to the east, and the Luiseño/Juaneño to the south. There was

well-documented interaction between the Gabrielino and many of their neighbors in the form of intermarriage and trade.

The name "Gabrielino" (also spelled Gabrieleno or Gabrieleño) denotes those people who were administered by the Spanish from Mission San Gabriel. This group is now considered a regional dialect of the Gabrielino language, along with the Santa Catalina Island and San Nicolas Island dialects (Bean and Smith 1978:538). In the post-European contact period, Mission San Gabriel included Natives of the greater Los Angeles area, as well as members of surrounding groups such as Kitanemuk, Serrano, and Cahuilla. There is little evidence that the people we call Gabrielino had a broad term for their group (Dakin 1978:222); rather, they identified themselves as an inhabitant of a specific community with locational suffixes (e.g., a resident of Yaanga was called a Yabit, much the same way that a resident of New York is called a New Yorker; Johnston 1962:10).

Native words suggested as labels for the broader group of Native Americans in the Los Angeles region include Tongva (or Tong-v; Merriam 1955:7–86) and Kizh (Kij or Kichereno; Heizer 1968:105), although there is evidence that these terms originally referred to local places or smaller groups of people within the larger group that we now call Gabrielino. Nevertheless, many present-day descendants of these people have taken on Tongva as a preferred group name because it has a Native rather than Spanish origin (King 1994:12). Thus, the term Gabrielino is used in the remainder of this setting section to designate Native people of the Los Angeles Basin and their descendants.

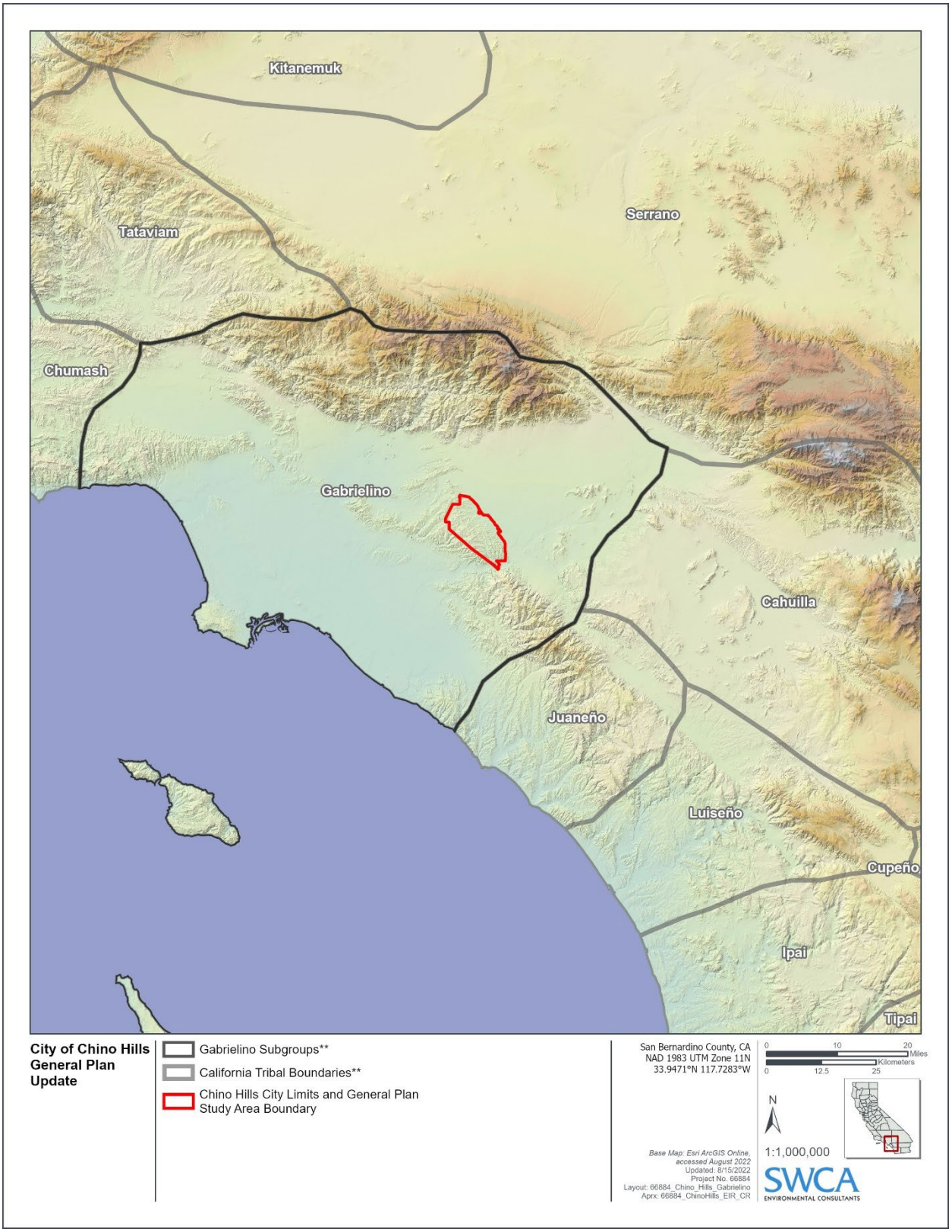


Figure 11. Native American territorial boundaries based on ethnographic and Tribal sources.

The Gabrielino subsistence economy was centered on gathering and hunting. The surrounding environment was rich and varied, and the Tribe exploited mountains, foothills, valleys, deserts, riparian, estuarine, and open and rocky coastal eco-niches. Like for most Native Californians, acorns were the staple food (an established industry by the time of the Early Intermediate period). Inhabitants supplemented acorns with the roots, leaves, seeds, and fruits of a variety of flora (e.g., islay [hollyleaf cherry], cactus, yucca, sages, and agave). Freshwater and saltwater fish, shellfish, birds, reptiles, and insects, as well as large and small mammals, were also consumed (Bean and Smith 1978:546; Kroeber 1925:631–632; McCawley 1996:119–123, 128–131).

The Gabrielino used a variety of tools and implements to gather and collect food resources. These included the bow and arrow, traps, nets, blinds, throwing sticks and slings, spears, harpoons, and hooks. Groups residing near the ocean used oceangoing plank canoes and tule canoes for fishing, travel, and trade between the mainland and the Channel Islands (McCawley 1996:7). Gabrielino people processed food with a variety of tools, including hammer stones and anvils, mortars and pestles, manos and metates, strainers, leaching baskets and bowls, knives, bone saws, and wooden drying racks. Food was consumed from a variety of vessels. Catalina Island steatite was used to make cooking vessels (Blackburn 1963; Kroeber 1925:629; McCawley 1996:129–138).

At the time of Spanish contact, the basis of Gabrielino religious life was the Chinigchinich cult, centered on the last of a series of heroic mythological figures. Chinigchinich gave instruction on laws and institutions, and also taught the people how to dance, the primary religious act for this society. He later withdrew into heaven, where he rewarded the faithful and punished those who disobeyed his laws (Kroeber 1925:637–638). The Chinigchinich religion seems to have been relatively new when the Spanish arrived. It was spreading south into the southern Takic groups even as Christian missions were being built and may represent a mixture of Native and Christian belief and practices (McCawley 1996:143–144).

Deceased Gabrielino were either buried or cremated, with inhumation more common on the Channel Islands and the neighboring mainland coast, and cremation predominating on the remainder of the coast and in the interior (Harrington 1942; McCawley 1996:157). Remains were buried in distinct burial areas, either associated with villages or without apparent village association (Altschul et al. 2007). Cremation ashes have been found in archaeological contexts buried within stone bowls and in shell dishes (Ashby and Winterbourne 1966:27), as well as scattered among broken ground stone implements (Cleland et al. 2007). Archaeological data such as these correspond with ethnographic descriptions of an elaborate mourning ceremony that included a variety of offerings, including seeds, stone grinding tools, otter skins, baskets, wood tools, shell beads, bone and shell ornaments, and projectile points and knives. Offerings varied with the gender and status of the deceased (Dakin 1978:234–365; Johnston 1962:52–54; McCawley 1996:155–165).

5.2.7 *Native American Communities Adjacent to the Study Area*

The settlement of Native American communities in Southern California during the prehistoric period has been studied extensively by archaeologists over time, including Chace (1969) who argued that coastal areas were used mainly for food procurement while villages were located inland; Hudson (1969, 1971) who argued that Native Americans moved seasonally between villages, located in sheltered coastal areas, inland prairies, and mountain areas, and temporary camps, located on the exposed coast; and Mason and Petersen (1994) who argued that major estuaries in the region were territory centers for clan-based groups in Rancherias, which were occupied year-round while several smaller sites were used to gather resources during various times of the year (Douglass et al. 2016:61–62). Generally, all models share the assumption that Native American groups in the region utilized various habitats, moving throughout the region at different times throughout the year. These prehistoric subsistence and settlement patterns are generally

believed to have remained the same until the first permanent Native American settlement was established at Mission San Gabriel (Douglass et al. 2016:385).

The precise location of most Native American villages in Southern California is subject to much speculation; however, maps depicting villages throughout the area show these sites located along rivers or streams, and several maps have been produced throughout the twentieth century depicting this settlement pattern. Native American place names referred to at the time of Spanish contact did not necessarily represent a continually occupied settlement within a discrete location, rather in at least some cases, the communities were represented by several smaller camps scattered throughout an approximate geography, shaped by natural features that were subject to change over generations (Johnston 1962:122). Further complicating any efforts to pinpoint the location of a given village site is the fact that many of the villages had long since been abandoned by the time ethnographers, anthropologists, and historians attempted to document any of their locations.

By the time any such effort was made, Native American lifeways had been irrevocably changed and the former village sites or areas were impacted by urban and agricultural development. In some cases, Spanish-era Rancho grants may have bounded Indian villages, and in others the Spanish ranchos adopted Native American place names, such as Kaweenga, Tujunga, Topanga, and Cucamonga. Alternative names and spellings for communities, and conflicting reports on their meaning or locational reference further complicate efforts at determining the locations of actual village sites. McCawley quotes Kroeber for his remarks on the difficulty of reliably locating former village sites, writing that "the opportunity to prepare a true map of village locations 'passed away 50 years ago'" (Kroeber 1925:616 as cited in McCawley 1996:32). Thus, even with ethnographic, historical, and archaeological evidence, it can be difficult to conclusively establish whether any given assemblage represents the remains of the former village site.

The nearest named villages to the study area are *Pasinongna, Wajijangna, Paxauxa*, and an unnamed village site to the north of the city boundary (Figure 12 and Figure 13). *Wajijangna* is mapped by Johnston (1962) immediately northeast of the study area, however, does not appear on Kirkman's 1937 map. Likewise, *Paxauxa* and the unnamed site, are mapped by Johnston (1962) but not by Kirkman (1937). *Pasinongna* is mapped by Johnston (1962) within the city boundary and immediately adjacent to Site 7 – The Commons, but mapped outside the city boundary to the east by Kirkman (1937). *Pasinongna* has been described as having been located on a rise above Chino Creek and would likely have had smaller villages and seasonal camps surrounding its vicinity (Gust and Valasik 2011).

Smaller habitation sites were not typically noted by early ethnographers and Spanish colonizers; therefore, the lack of explicit data pointing to a site in the area does not indicate a lack of Native American activity in the area.

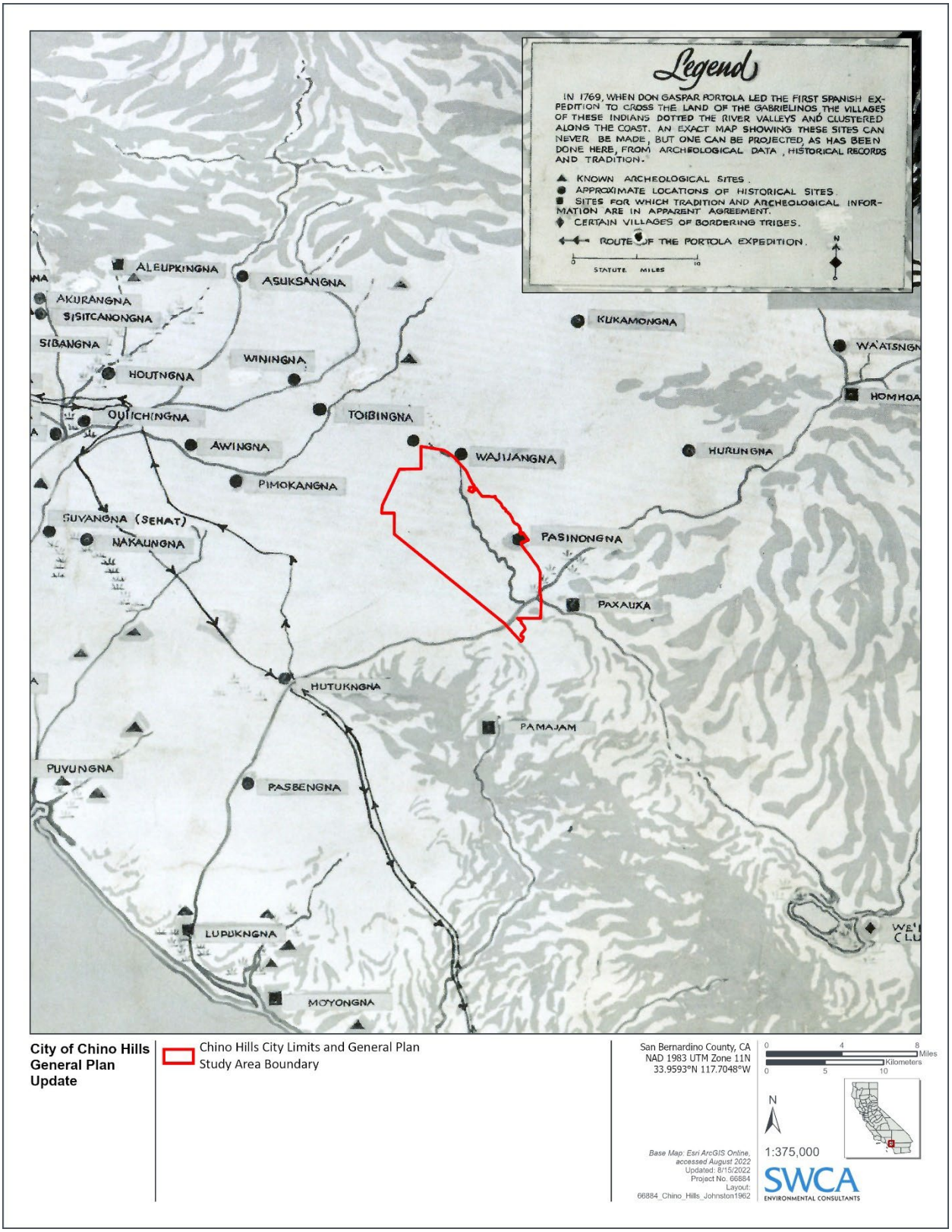


Figure 12. Ancient village sites in Gabrielino territory (based on Johnston 1962).


SAN GABRIEL MOUNTAINS
SAN BERNARDINO MOUNTAINS
SANTA ANA MOUNTAINS
SAN JOAQUIN HILLS
SANTA ANA RIVER
RIVERSIDE COUNTY
THE KIRKMAN-HARRIMAN
Pictorial and Historical Map
of
Los Angeles County: 1860 A.D.
1937 A.D.
Historic Sites - OLD HIGHWAYS = Also, Battle-Fields.
- SPANISH-MEXICAN-EARLY AMERICAN -
OLD
LOS ANGELES COUNTY
LEGEND: - Portola's First Exploring Route
- Camps and Dates
- El Camino Real (Official Spanish Roads)
- Mission Roads (Created Highways, May, 1821)
- Old Roads (" " "),
(Ancient) Together with a few established, bef. 1890
- Dual Line - 1860 A.D.
Battle-Field
Indian Fight
Indian Village
Old Time
Old Stage Road
Mission Road
Old State Road
Old Spanish Trail
Santa Ana River
Riverside
San Bernardino
Los Angeles
Orange
San Diego
Pacific Ocean
Lee Lake
Coyote Hills
Chino Hills
Puente Hills
San Jose Hills
Jurupa Hills
Aqua Mansa
Mt. Gleason
Mt. San Antonio
Strawberry Pk.
Mt. Lowe
Mt. Wilson
Sierra Madre
Pasadena
Alhambra
Monterey Park
San Gabriel
Azusa
Glendora
Pomona
Claremont
Ontario
Cucamonga
Rancho Cucamonga
San Bernardino
Colton
Riverside
Corona
Norco
Fullerton
Anaheim
Santa Ana
Tustin
Irvine
Orange
Tustin Hills
Santiago Creek
Temescal Creek
Temescal Canyon
Lee Lake
Newport
Huntington Beach
Long Beach
Whittier
Norwalk
Downey
Artesia
Bellflower
Los Nietos
Rancho La Habra
Rancho Santa Ana del Chino
Rancho Cucamonga
Rancho Jurupa
Rancho La Sierra
Rancho Yorba
Rancho Las Bolsas
Rancho Santiago de Santa Ana
Rancho Lomas de Santiago
Rancho Canada de los Alisos
Rancho Mission Viejo
Rancho Trabuco
Rancho Canada de los Vaqueros
Rancho Sierra de Santiago de Santa Ana
Rancho Cañada de los Alisos
Rancho Niguel
Rancho Aliso y Moro
Rancho Boca de la Playa
Rancho Las Flores
Rancho Las Virgenes
Rancho Topanga Malibu Sequit
Rancho Simi
Rancho Guadalasca
Rancho Calleguas
Rancho Las Posas
Rancho Santa Rosa
Rancho Conejo
Rancho Triunfo
Rancho Sespe
Rancho Ojai
Rancho Ventura
Rancho Ex-Mission de San Buenaventura
Rancho Ex-Mission de San Fernando
Rancho Ex-Mission de San Gabriel
Rancho Los Cerritos
Rancho Los Alamitos
Rancho Las Bolsas
Rancho Las Palmas
Rancho Santa Margarita

5.2.8 *Historic Overview*

Post-contact history for the state of California is generally divided into three periods: the Spanish period (1769–1822), Mexican period (1822–1848), and American period (1848–present). Although Spanish, Russian, and British explorers visited the area for brief periods between 1529 and 1769, the Spanish period in California begins with the establishment in 1769 of a settlement at San Diego and the founding of Mission San Diego de Alcalá, the first of 21 missions constructed between 1769 and 1823. Independence from Spain in 1821 marks the beginning of the Mexican period, and the signing of the Treaty of Guadalupe Hidalgo in 1848, ending the Mexican–American War, signals the beginning of the American period, when California became a territory of the United States.

5.2.9 *Spanish Period (1769–1821)*

Spanish explorers made sailing expeditions along the coast of California between the mid-1500s and mid-1700s. Juan Rodríquez Cabrillo stopped in 1542 at present-day San Diego Bay; over the next half-century, much of the present California and Oregon coastline was mapped and recorded by Spanish naval officer Sebastián Vizcaíno. The Spanish crown laid claim to California based on the surveys conducted by Cabrillo and Vizcaíno (Bancroft 1886). More than 200 years passed before Spain began the colonization and inland exploration of Alta (Upper) California. The 1769 overland expedition by Captain Gaspar de Portolá marks the beginning of California's historic period, occurring just after the King of Spain installed the Franciscan Order to direct religious and colonization matters in assigned territories of the Americas. With a band of 64 soldiers, missionaries, Baja (lower) California Native Americans, and Mexican civilians, Portolá established the Presidio of San Diego, a military outpost, as the first Spanish settlement in Alta California in 1769. Franciscan missionary Junípero Serra founded Mission San Diego de Alcalá, the first of the 21 missions that would be established in Alta California between 1769 and 1823. Mission San Gabriel Arcángel in the present-day Los Angeles area was founded in 1771 (Mission San Gabriel Arcangel 2022). By the end of the eighteenth century, Mission San Fernando was founded also in the Los Angeles area, Mission San Juan Capistrano in present-day Orange County, and Mission San Luis Rey in present-day northern San Diego County (California Missions Foundation 2022).

A major emphasis during the Spanish period was the construction of missions and associated presidios to integrate the Native American population into Christianity and communal enterprise. Incentives were also provided to bring settlers to pueblos or towns, but just three pueblos were established during the Spanish period, only two of which were successful and remain as California cities (San José and Los Angeles).

It is reported that Spanish military commander Pedro Fages entered the San Bernardino Valley in 1772 following deserting soldiers from San Diego. However, the valley was not named as such until 1810 when Father Francisco Dumetz, a priest from Mission San Gabriel Arcángel, visited the area (Belden 1960). In 1819, an estancia (sometimes referred to as an asistencia) was established in the present-day Redlands area as part of Mission San Gabriel's Rancho San Bernardino. This functioned as an outpost for cattle grazing activities (County of San Bernardino 2007).

5.2.10 *Mexican Period (1821–1848)*

Several factors had kept growth within Alta California to a minimum, including the threat of foreign invasion, political dissatisfaction, and unrest among the Indigenous population. After more than a decade of intermittent rebellion and warfare, Mexico won its independence from Spain in 1821. In 1822, the Mexican legislative body in California ended isolationist policies designed to protect the Spanish monopoly on trade, and decreed California ports open to foreign merchants. Extensive land grants were established in the interior during the Mexican period, in part to increase the population inland from the more settled coastal areas where the Spanish had first concentrated their colonization efforts. The

Mexican government's secularization of the missions resulted in the subdivision of former mission lands and establishment of many additional ranchos. During the supremacy of the ranchos (1834–1848), landowners largely focused on the cattle industry and devoted large tracts to grazing. As many as seven ranchos were established in what is now San Bernardino County (Perez 1982). Cattle hides became a primary southern California export, providing a commodity to trade for goods from the east and other areas in the United States and Mexico. The number of non-Native inhabitants increased during this period because of the influx of explorers, trappers, and ranchers associated with the land grants. The rising California population contributed to the introduction and rise of diseases foreign to the Native American population, who had no associated immunities.

5.2.11 *American Period (1848–Present)*

In 1846, war between Mexico and the United States began at the Battle of Chino, a clash between resident Californios and Americans in the San Bernardino area. This battle was a defeat for the Americans and bolstered the Californios' resolve against American rule, emboldening them to continue the offensive in later battles at Dominguez Field and in San Gabriel (Beattie 1942). However, this early skirmish was not a sign of things to come and the Americans were ultimately the victors of this 2-year war. The Mexican–American War officially ended with the Treaty of Guadalupe Hidalgo in 1848, which resulted in the annexation of California and much of the present-day Southwest, ushering California into its American period.

California officially became a state with the Compromise of 1850, which also designated Utah and New Mexico (with present-day Arizona) as U.S. territories. Horticulture and livestock, based primarily on cattle as the currency and staple of the rancho system, continued to dominate the southern California economy through 1850s. The Gold Rush began in 1848; with the influx of people seeking gold, cattle were no longer desired mainly for their hides, but also as a source of meat. During the 1850s cattle boom, rancho vaqueros drove large herds from southern to northern California to feed that region's burgeoning mining and commercial boom. Cattle were at first driven along major trails or roads such as the Gila Trail or Southern Overland Trail, then were transported by trains when available. The cattle boom ended for southern California as neighbor states and territories drove herds to northern California at reduced prices. Operation of the huge ranchos became increasingly difficult, and droughts severely reduced their productivity (Cleland 2005).

5.2.12 *City of Chino Hills*

The city of Chino Hills was established on the lands of the Spanish-era Rancho Santa Ana del Chino. With the establishment of the nearby Mission San Gabriel Arcángel in 1771, the area encompassing present-day Chino Hills and Chino was claimed by the Spaniards and used as grazing land for the mission's cattle. The Rancho Santa Ana del Chino remained under Spanish control for the next 40 years until Mexican Independence was gained in 1821. Following the secularization of the missions, Governor Juan Batista Alvarado granted the rancho to Don Antonio María Lugo in 1841. Lugo later turned over the approximately 22,000-acre rancho to his son-in-law Isaac Williams, who had married Lugo's daughter María de Jesús in 1839, converted to Roman Catholicism, and adopted the name Julián. He and Maria had three children, Francisca, Merced, and Antonio, but María died in childbirth and their son Antonio passed away in his youth. In 1843, Williams was granted an additional 13,000 acres. He lived in the adobe house that Lugo had built (near the present-day location of the Boys Republic facility) (Hoover et al. 2002; Spitzzeri 2018a).

The route of present-day State Route (SR) 71, along the eastern edge of Chino Hills, was part of a nineteenth century thoroughfare used by countless travelers, gold seekers, and migrants passing through the area. Williams was said to have hosted many of them at his rancho, at times providing assistance in

the form of provisions and money (Spitzzeri 2018b). He is also known for being entangled in the Battle of Chino, which took place at Williams' home in September 1846 and involved Williams defending his home with other Americans and Europeans against Californios, including his Lugo brothers-in-law. Williams' home was burned down and he was taken prisoner and held until January 1847 (Spitzzeri 2018c).

Williams died in 1856, leaving the rancho to his two daughters. By the 1860s, Francisca was in control of the rancho, and hired Joseph Bridger, her brother-in-law, to run it, as she lived in Los Angeles. Bridger built an adobe house for himself at the ranch headquarters (referred to as the "Home Place"). Bridger died in 1880; in 1881, Francisca sold the ranch to mining tycoon Richard Gird. He and his wife Nellie moved into Bridger's former home. Gird later acquired another 9,000 acres, and raised horses and cattle, many of which grazed in the Chino Hills. In 1887, Gird subdivided 640 acres of the ranch to create the Chino townsite (Figure 14. By the early 1890s, Gird was financially overextended, took out a loan, and sought to sell portions of the ranch. Ultimately, the Chino Land and Water Company bought out Gird's mortgage, and later marketed and sold large portions of the ranch (Spitzzeri 2018d, 2019a, 2019b).



Figure 14. Chino Hills area southwest of the town of Chino depicted on an 1887 map by H.B. Martin (Source: Huntington Library).

Some oil exploration was conducted at the turn of the nineteenth to twentieth century in the hills where the Chino Hills State Park exists today (California State Parks 2018). An early and substantial development in Chino Hills was the Boys Republic, constructed in 1909 on an approximately 200-acre site. Originally called the California Junior Republic, the organization was founded to provide support to troubled teenagers to help them avoid incarceration as adults. Margaret Fowler of Pasadena purchased the

farmland in the Chino Hills area to develop the extant facility (Boys Republic 2022). At the time of its establishment, the Boys Republic was surrounded by undeveloped hills to the west and agricultural uses on the flatter land to the east (Figure 15).



Figure 15. Nearly 20 years after opening, in 1928, the Boys Republic (lower right corner) was still surrounded by primarily undeveloped hilly and agricultural land (Source: University of California, Santa Barbara Library 1928a).

In 1914, three Los Angeles–area businessmen purchased land in the western Chino Hills, which they named Tres Hermanos Ranch. These men were Harry Chandler (whose family owned the *Los Angeles Times*), Tom Scott (an attorney who was involved in oil exploration and real estate), and William Rowland (a former Los Angeles County Sheriff and descendant of wealthy rancher John Rowland). The property functioned as a working cattle ranch, a weekend getaway, and a place to host private parties for their elite guests (City of Chino Hills 2015b). In 1978, the City of Industry's Redevelopment Agency (RDA) bought the ranch. It was then acquired by the City of Industry in 2012 when the RDA dissolved. The 2,445-acre property is now owned by the Tres Hermanos Conservation Authority. It lies partially in Chino Hills and partially in Diamond Bar (City of Chino Hills 2022a).

By the 1920s, as the Los Angeles region underwent a population and building boom, some residential subdivisions began to appear in the Chino Hills area. The neighborhood known as Sleepy Hollow began forming ca. 1920 in the rural Carbon Canyon (Figure 16). It primarily served as a summer recreational destination for Angelinos, with small cabins built on small lots; these were later enlarged or rebuilt and became a more permanent community (City of Chino Hills 2022b; Lee 2006). The Los Serranos Country

Club, developed by a group of out-of-town investors, opened to the public in 1925. It was heavily marketed to individuals in the Los Angeles and Long Beach area, and featured a variety of recreational activities including golf, swimming, boating and other watersports, horseback riding, and polo (*Long Beach Press-Telegram* 1924c). Members of the golf club were also able to purchase small lots adjacent to the course. It appears the homes were modest in scale, as they were locally referred to as bungalows (*Chino Champion* 1927a, 1937; City of Chino Hills 2022b). Early homes built in this area, along with Sleepy Hollow in Carbon Canyon, were some of the earliest in what would later become the city of Chino Hills (City of Chino Hills 2022c). However, the lots adjacent to the club developed slowly. In 1935, only a handful of homes had been built. Club members planned for the construction of 10 bungalows between 1936 and 1937. As seen in Figure 17, in 1946, the area was still sparsely developed (University of California, Santa Barbara [UCSB] Library 1935, 1946). They gradually filled in over the subsequent decades. By the end of the 1950s, residential construction had expanded to the north and east of the country club, although large agricultural or dairy establishments were still located along Eucalyptus Avenue and Chino Hills Parkway (NETROnline 1938–2020).

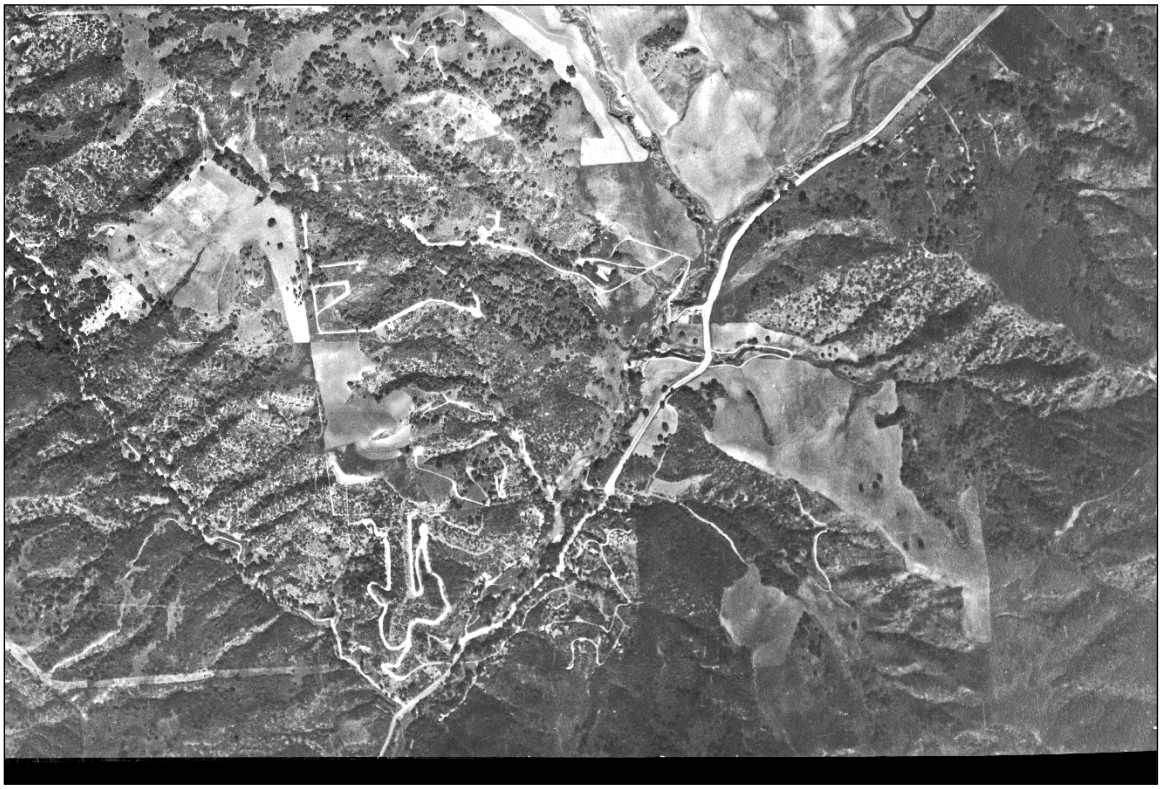


Figure 16. The rural Sleepy Hollow area showed sparse development in 1928 (Carbon Canyon Road is the prominent thoroughfare) (Source: UCSB Library 1928b).



Figure 17. In 1946, more than 20 years after Los Serranos Country Club opened, the adjacent residential lots to the north were still sparsely developed (Source: UCSB Library 1946).

Carbon Canyon Road was developed starting in the 1910s, with a key goal of providing a shorter route to the coast. The road was integrated into the state highway system in the 1930s. Major transportation and access improvements such as these supported the establishment of a correctional facility in the area in 1941 (the California Institution for Men), sited near the eastern terminus of Carbon Canyon Road. As Paul Spitzzeri—local historian and director of the Workman & Temple Family Homestead Museum—asserts, the prison's presence is one of the primary reasons for delayed suburban development in the area (Spitzzeri 2020a).

In the second half of the twentieth century, suburban, manufacturing and business development increased in the nearby city of Chino, and the area to the southwest that had remained primarily rural saw a number of new suburban housing tracts by the 1970s as it expanded towards the Chino Hills (Cal Poly Pomona University Library 2021; NETROnline 1938–2020).

In 1963, a large cattle ranch on Carbon Canyon Road gave way to the construction of the Western Hills Country Club. The lots north of Los Serranos Country Club were more densely filled in by the mid-1960s, and by the early 1970s, additional homes were constructed nearby to the west and north of Lake Los Serranos and on the east side of SR 71. By about 1980, the lots adjacent to Los Serranos Country Club were nearly built out, and the community had further expanded to areas northwest of the lake between Eucalyptus Avenue and Chino Hills Parkway. Large residential tracts were built in the hills along Carbon Canyon Road. The northernmost end of the city began filling in, and commercial properties were built along Chino Hills Parkway. By the late 1980s, home construction pushed into more hilly areas

to the west between Peyton Drive and Carbon Canyon Road, and the northern area of the city near SR 60 saw increased density. Additionally, residential tracts were constructed in the southern end of the city near SR 71 and Butterfield Ranch Road. Commercial development continued through the 1990s and 2000s, with new shopping centers such as the Chino Hills Marketplace, The Shoppes, and The Commons constructed to support the area's increased population (NETROnline 1938–2020).

Concerns about the loss of natural open space led to the formation of a group called Hills for Everyone in 1977, which worked closely with the California State Parks department to create a protected open space area that eventually became Chino Hills State Park (Hills for Everyone 2022). The original land acquisition was 2,237 acres, which was officially declared a unit of the State Park System in 1984. Additional land acquisitions expanded the park over the following years to over 14,000 acres (California State Parks 2018).

In 1979, the County of San Bernardino began working on a specific plan for approximately 26 square miles in what is today Chino Hills. It was a unique endeavor—the first specific plan created in the state of California for an unincorporated area. Following much involvement from local property owners, the county finalized and approved the specific plan in 1982, at which time there were approximately 12,000 residents and 4,000 homes in the community. The specific plan called for commercial development along SR 71, and clustered residential development in "village cores," with the highest density in the core and decreasing density moving away from the core. Area residents explored the pros and cons of cityhood during the late 1980s, and the city of Chino Hills formally incorporated in 1991 (City of Chino Hills 2022b). As of the last census, the city has a population of approximately 78,400 residents (U.S. Census Bureau 2022).

6 NATIVE AMERICAN CONSULTATION

6.1 Sacred Lands File Search

The NAHC is charged with identifying, cataloging, and protecting Native American cultural resources and manages the state's SLF database. These sacred lands resources include places of special religious or social significance to Native Americans and known Native American graves and cemeteries on private and public lands in California. The contents of the SLF are strictly confidential and the results are simply reported as "positive" or "negative." In addition to the SLF, the NAHC maintains a list of tribal contacts affiliated with various geographic regions of California and provides recommendations for contacting tribes and representatives for any additional or unrecorded information.

Native American coordination conducted in support of the 2015 General Plan Update concluded that the entire city is sensitive for prehistoric resources (Gust and Valasik 2011). As a result of this finding, Goal CN-2 of the 2015 General Plan, as outlined above in Section 4.3.1, was established. Specifically, consultation with local Native American tribes is required for each project within the General Plan study area.

On May 10, 2022, SWCA requested a record search of the SLF along with a list of Native American contacts for the study area from the NAHC and the City requested a Tribal Consultation List for San Bernardino County. SWCA received a response letter from the NAHC dated June 13, 2022, which indicated that a record of a sacred site had been identified within the study area. The NAHC recommended contacting the Gabrieleno (Tongva) San Gabriel Band of Mission Indians for additional information. The NAHC also provided a list of 16 Native American groups and individuals who may have knowledge of cultural resources in the study area. The NAHC also provided the City with the Tribal

Consultation List for San Bernardino County, which listed 15 interested Native American groups and individuals (Appendix B).

6.2 Assembly Bill 52 and Senate Bill 18 Notification

Of the 16 Native American groups and individuals identified in response to the SLF search, two had previously requested AB 52 consultation for all projects with the city: the Gabrieleño Band of Mission Indians – Kizh Nation and the Soboba Band of Luiseño Indians. On May 16, 2022, the City mailed letters to the two Tribes. Pursuant to the requirements of AB 52, each letter included a description of the City's efforts to update the General Plan (project description) and notified each contact that requests for formal consultation were required to be sent within 30 days.

On September 13, 2022, the City mailed letters to all 15 interested Native American groups and individuals included on the county-wide Tribal Consultation List. Pursuant to the requirements of SB 18, each letter included a description of the City's efforts to update the General Plan (project description) and notified each contact that requests for formal consultation were required to be sent within 90 days. The results of AB 52 and SB 18 outreach are outlined in Section 7.2 and Section 8.2.

7 PROGRAM-LEVEL ANALYSIS OF THE CITY LIMITS AND TWO RHNA SITES

The proposed General Plan Update includes policies under the Housing and Land-Use elements that have particular relevance for cultural resources. Continued implementation of the General Plan will allow the City to evaluate and encourage development projects that are consistent with the City's priorities, including the preservation of existing archaeological and built environment resources when such resources meet the minimum age criterion to be considered historical resources. The Chino Hills city limits and, at the request of the City, two of the eleven RHNA sites (Canyon Estates [Low Density] and Los Serranos Golf Course [Low Density]) are analyzed herein at a program-level.

The program-level analysis included a confidential search of the CHRIS records and a SLF search through the California NAHC.

7.1 California Historical Resources Information System Records Search

7.1.1 *Methods*

On August 4, 2022, SWCA requested a confidential search of the CHRIS records from the South Central Coastal Information Center (SCCIC) on the campus of California State University, Fullerton, to identify previously documented cultural resources and investigations within the city limits, the Canyon Estates (Low Density), and Los Serranos Golf Course (Low Density) RHNA sites. The SCCIC maintains records of previously documented confidential archaeological resources and technical studies. This information includes specifics as to the nature and location of sensitive archaeological sites, which is not to be disclosed to the public or unauthorized persons and are exempt from the Freedom of Information Act.

In addition to reviewing prior studies and previously recorded cultural resources, SWCA reviewed the California OHP's Built Environment Resources Directory (BERD) which includes listings of the NRHP, CRHR, California Historical Landmarks, and California Points of Historical Interest. SWCA also

examined historical maps and aerial photographs and reviewed the previous City of Chino Hills General Plan (adopted February 24, 2015), and the cultural resources assessment prepared by Cogstone (Gust and Valasik 2011) in support of the 2015 General Plan.

Geographic information has not been digitized for San Bernardino County; therefore, no GIS data were received. Rather, data pertaining to the reports and resources are based on the SCCIC database of text information. These data include categories for previously conducted studies. Data provided by the SCCIC may also include slight errors, particularly where the geographic extent is based on poor resolution in the original sources.

7.1.2 *Results*

7.1.2.1 PREVIOUS CULTURAL RESOURCE STUDIES

Results of the cultural resources records search indicate that 105 previous cultural resource studies have been conducted within the study area between 1973 and 2016. Details of these studies are included in Appendix A, Table A-1. Of the 105, 49 incorporated some fieldwork component, nine included site testing, four summarized the results of construction monitoring, and 35 were desktop-only reports (e.g., literature searches, existing conditions reports). The remaining eight studies cannot be categorized due to insufficient information.

7.1.2.2 PREVIOUSLY RECORDED CULTURAL RESOURCES

The CHRIS records search indicates that 142 cultural resources have been previously recorded within the General Plan study area (Appendix A, Table A-2). A review of the California OHP's BERD identified an additional 11 built environment resources in the study area. The 153 resources include 70 prehistoric archaeological resources, 33 historic-period archaeological resources, 14 multicomponent resources, 34 historic-period built environment resources, and two resources which cannot be categorized due to insufficient information. The 34 previously recorded built environment resources included transmission towers, single-family and commercial properties, and a bridge, among others (details are summarized in Appendix A, Table A-2). Designated or eligible built environment resources are discussed below.

7.1.2.3 PROPERTIES DESIGNATED AT THE FEDERAL, STATE OR LOCAL LEVEL

Federal

No built environment resources in Chino Hills are listed on or have been determined eligible for the NRHP.

State

The Site of the Rancho Chino Adobe is a California Historical Landmark and is identified by a marker at a former fire station at 4040 Eucalyptus Avenue (California OHP 2022a; Gust and Valasik 2011).

The Site of the Battle of Chino, a California Point of Interest, is identified by a marker at the same property, 4040 Eucalyptus Avenue (California OHP 2022a; Gust and Valasik 2011).

Local

There is no local register of historical resources for the city of Chino Hills; therefore, no properties in the city are formally designated as historical resources. However, the General Plan Conservation Element (adopted February 2015) identified five areas in the city that had the potential for historical significance. A summary of findings is provided below:

Boys Republic

Developed in 1909, the Boys Republic facility is considered locally significant as a built environment historical resource and as a potential archaeological district with both prehistoric and Mexican periods of significance. The property is believed to be the probable location of the prehistoric village of Pashiinonga and the former location of Isaac Williams' adobe house and ranch, which was the site of the Battle of Chino. Subsurface remnants of these previous occupations are highly likely to be present.

The Boys Republic property was recommended as a potential historic district with a period of significance of 1909 to 1959 when the facility used agricultural training as the primary method of helping troubled youth and during which most of the buildings on the property were constructed. The property has not been formally designated.

Tres Hermanos Ranch

Partially in Chino Hills and partially in Diamond Bar, the Tres Hermanos Ranch was developed starting around 1910 by well-known businessmen and public figures Harry Chandler, Tom Scott, and William Rowland. An adobe house on the property was built ca. 1914. A multiple-arch dam was built in 1918 to detain water for what is now known as the Arnold Reservoir. The property is potentially significant for associations with important persons in local history, architecture/engineering, and information potential; however, the property has not been formally designated.

Carbon Canyon

The Sleepy Hollow area was developed starting in the 1920s with modest buildings that functioned primarily as weekend getaway cabins. It is believed that few of the original cabins remain; consequently, there is a low probability that Sleepy Hollow would qualify as a historic district. The designation has not been formally applied; however, it was recommended that a marker acknowledge the local importance of the distinctive neighborhood.

Los Serranos Neighborhood

The Los Serranos neighborhood was formally evaluated for potential historical significance. It was found that only 5 percent of the homes predate 1945, while over 50 percent were built after 1970. The neighborhood was not found to be a significant example of suburban residential development, or have an association with important events, persons, developers, or designers. In addition to not qualifying as a historic district, none of the individual homes recorded – which were the best preserved – were found eligible for federal or state designation. However, it was noted that an archaeological district could be considered for the vicinity of the original clubhouse, which was previously the Bridger/Gird adobe residence.

Laband

The local importance of equestrian properties in the development of the city is recognized through an Equestrian Overlay Zone that recognizes the English Road area in the village of Laband as a unique

equestrian area. Establishment of a conservation area has been suggested to recognize the local importance of horse properties in the development of the city. The designation has not been formally applied.

7.2 Native American Consultation

Of the 16 Native American groups and individuals identified in response to the SLF search, two had previously requested AB 52 consultation for all projects with the city: the Gabrieleño Band of Mission Indians – Kizh Nation and the Soboba Band of Luiseño Indians. On May 16, 2022, the City mailed letters to the two Tribes. Pursuant to the requirements of AB 52, each letter included a description of the City's efforts to update the General Plan (project description) and notified each contact that requests for formal consultation were required to be sent within 30 days. On May 25, 2022, the Gabrieleño Band of Mission Indians – Kizh Nation responded, acknowledging the project's intent. The letter stated that they are not pursuing AB 52 consultation for the General Plan Update but requested consultation status for all future projects. To date, no additional requests for consultation have been received in response to the AB 52 notification letters.

On September 13, 2022, the City mailed letters to all 15 interested Native American groups and individuals included on the county-wide Tribal Consultation List. Pursuant to the requirements of SB 18, each letter included a description of the City's efforts to update the General Plan (project description) and notified each contact that requests for formal consultation were required to be sent within 90 days. On September 19, 2022, the Gabrieleño Band of Mission Indians – Kizh Nation responded, acknowledging the project's intent. The letter stated that they are not pursuing SB 18 consultation for the General Plan Update but requested consultation status for all future projects. To date, no additional requests for consultation have been received in response to the SB 18 notification letters.

7.3 Impact Assessment

The proposed General Plan Update itself will not result in significant adverse impacts to any known cultural resources. However, any future development or changes in existing land use within the city or site-specific development of Canyon Estates (Low Density) and Los Serranos Golf Course (Low Density) has the potential to result in impacts to cultural resources as surface-level and subsurface archaeological sites and deposits can be present and affected.

Historic built environment resources can be directly affected by demolition activities or extensive remodeling, and indirectly affected by noise, vibration, and changes to setting and viewshed. As such, any development or change in existing land use within the city and the two RHNA sites analyzed at a program-specific level will require a site-specific analysis.

7.3.1 *Significance Thresholds*

7.3.1.1 ARCHAEOLOGICAL RESOURCES

Under CEQA, archaeological resources may meet the definition of a historical resource or unique archaeological resource. Any project that may cause a substantial adverse change in the significance of a historical resource would also have a significant effect on the environment. Substantial adverse change to the significance of a historical resource is defined as physical demolition, destruction, alteration, or relocation of the resource or immediate surroundings such that its significance would be materially impaired. CEQA states that when a project would cause damage to a unique archaeological resource, reasonable efforts must be made to preserve the resource in place or leave it in an undisturbed state.

General or specific measures are required to the extent that the resources could be damaged or destroyed by a proposed project. Implementation of the general measures in the following section would mitigate to the greatest extent feasible the potential for future projects to impact archaeological resources.

7.3.1.2 BUILT ENVIRONMENT HISTORICAL RESOURCES

Under CEQA, any project that may cause a substantial adverse change in the significance of a historical resource would also have a significant effect on the environment. Substantial adverse change to the significance of a historical resource is defined as physical demolition, destruction, alteration, or relocation of the resource or immediate surroundings such that its significance would be materially impaired. CEQA states that when a project will cause damage to a historical resource, reasonable efforts must be made to mitigate, avoid, or otherwise lessen the impact, through the adoption of enforceable mitigation measures, and to consider feasible alternatives capable of achieving project objectives while avoiding significant adverse impacts. . Under CEQA, projects that comply with the *Secretary of the Interior's Standards for the Treatments of Historic Properties* are typically considered to be projects that would not cause a significant adverse impact to historical resources.

7.4 Recommended Impact Avoidance and Mitigation Measures

7.4.1 *General Plan Policies*

The following sections summarize the existing General Plan policies that are applicable to the cultural resources. These policies and actions should carry forward to the General Plan Update.

7.4.1.1 ARCHAEOLOGICAL RESOURCES

Implementation of the City's existing General Plan Policy CN-2.1 and Actions CN-2.1.1 through CN-2.1.4 would reduce any potential impacts to less-than-significant levels, pursuant to CEQA. Therefore, the requirements established in the 2015 Chino Hills General Plan would still be applicable to the current General Plan Update SEIR. Implementation of appropriate cultural resource surveys (CN-2.2.1) and Native American consultation (CN-2.1.4) may result in the development of project-specific archaeological and/or tribal cultural resources mitigation measures that will need to be applied. The existing General Plan (City of Chino Hills 2015a) policy and actions are listed below for reference.

Policy CN-2.1: Protect Chino Hills' archaeological resources

Action CN-2.1.1: Require appropriate archaeological surveys as part of the environmental review process where archaeological resources may be present.

Action CN-2.1.2: Require on-site inspections by a qualified archaeologist during grading activities where archaeological resources may be present.

Action CN-2.1.3: Where archaeological resources are found during development activities, require identified archaeological materials to be preserved, restored, cataloged, and/or transmitted to the appropriate repository or as otherwise directed by a qualified professional archaeologist.

Action CN-2.1.4: Consult with local Native American tribes as required to avoid impacts on archaeological resources.

7.4.1.2 BUILT ENVIRONMENT RESOURCES

Future development or improvements related to changes in land use could potentially cause significant adverse impacts to historical resources. The General Plan study area contains properties that are 50 years or older, and it is possible that future development in the General Plan area will result in the identification of additional historical resources. As the 8-year cycle for the Housing element spans 2021 through 2029, properties that were developed before 1984 will meet the age criterion for assessment to determine if they qualify as historical resources pursuant to CEQA. Therefore, adoption of the General Plan could result in significant adverse impacts and material impairment to historical resources, and mitigation is required.

The 2015 Chino Hills General Plan contains a policy and actions to protect the City's potential historical resources. This includes required measures for changes in land use or other actions on properties that may qualify as historical resources. The measures include requiring historic resource surveys by a qualified historic resource consultant and incorporation of any recommendations as part of development approvals for any change in land use or other actions on the Boys Republic property and Tres Hermanos property. Also, prior to grading on the site of the original Los Serranos Country Club clubhouse, an archaeological survey is required and any recommendations are required to be incorporated into development approvals. Lastly, according to the City's 2015 General Plan, for structures over 45 years old, a review of available City building records is required to make a determination regarding a structure's potential historical significance prior to permitting its demolition or substantial alteration.

The existing General Plan (City of Chino Hills 2015a) policy and actions are listed below for reference.

Policy CN-2.3: Protect Chino Hills' archaeological resources

Action CN-2.3.1: Prior to a change of land use or other action on the Boys Republic property that could disturb a potential historic resource, require a historic resource survey of the property by a qualified historic resource consultant, and consider incorporating any recommendations as requirements into subsequent development approval.

Action CN-2.3.2: Prior to a change of land use or other action on the Tres Hermanos property that could disturb a potential historic resource, require a historic resource survey of the property by a qualified historic resource consultant, and consider incorporating any recommendations as requirements into subsequent development approval.

Action CN-2.3.3: Prior to grading on-site of the original clubhouse of the 1925 Los Serranos Country Club, require an appropriate archaeological survey to determine the presence of artifacts associated with the former Bridger/Gird Adobe site and consider incorporating any recommendations as requirements into subsequent development approval.

Action CN-2.3.4: Consider placement of markers to acknowledge the local importance to Chino Hills' history of the Carbon Canyon and English Road equestrian communities.

Action CN-2.3.5: For structures over 45 years old, review available City building records and make a determination regarding the structure's potential historical significance prior to permitting its demolition or substantial alteration.

7.4.2 *Mitigation Measures*

As noted above, adoption of the General Plan could result in significant adverse impacts and material impairment to historical resources; these mitigation measures are designed to reduce impacts to less than significant. The following mitigation measures should apply to all development projects within the General Plan study area, including the Canyon Estates (Low Density) and Los Serranos Golf Course (Low Density) RHNA sites. These measures should be incorporated as mitigation measures within the CEQA document on the General Plan Update.

Mitigation Measure GP-CR-1. Historic Resources. The following measures shall be required for all development projects within the city limits where construction activities may impact potential or previously identified historical resources.

a. The project proponent shall provide a historical resources assessment performed by an architectural historian or historian who meets the Secretary of the Interior's Professional Qualification Standards for architectural history or history (as defined in 48 CFR 44716) to the City of Chino Hills Planning Division for review and approval. The historical resources assessment shall include a records search at the SCCIC and a survey in accordance with California OHP guidelines to identify any previously unrecorded potential historical resources that may be potentially affected by the proposed project.

b. If a project requires the alteration, rehabilitation, or relocation of a historical resource, the project proponent shall use *the Secretary of the Interior's Standards for the Treatment of Historic Properties* to ensure the historical significance of the resource is not impaired. The application of the standards shall be overseen by an architectural historian or historian meeting the Secretary of the Interior's Professional Qualification Standards. Prior to any construction activities that may affect the historical resource, an analysis, meeting industry standards, shall identify and specify the treatment of character-defining features and construction activities and be provided to the City of Chino Hills Planning Division for review and approval. A project proponent, its construction personnel, and all subcontractors shall comply with the procedures outlined in the resulting analysis.

Additional review may be required should historical resources be identified and should the proposed project not comply with the *Secretary's Standards for the Treatment of Historic Properties*.

8 PROJECT-SPECIFIC ANALYSIS OF THE REGIONAL HOUSING NEEDS ASSESSMENT SITES

As previously discussed, the current General Plan Update consists of an update to the Housing Element and related updates to the Land Use, Safety, and Circulation Elements. As part of the Housing Element update, the City identified 11 sites for future housing development, referred to as the RHNA sites: Site 1 – The Shoppes II, Site 2 – Park Overflow, Site 3 – Los Serranos Golf Club, Site 4 – Western Hills Country Club, Site 5 – Wang (High Density), Site 6 – The Shoppes, Site 7 – The Commons, Site 8 – Canyon Estates (Medium Density), Site 9 – Wang (Medium Density), Site 10 – Canyon Estates (Low Density), and Site 11 – Los Serranos Golf Course (Low Density).

At the request of the City, the two RHNA sites designated for low density residential use (Site 10 - Canyon Estates [Low Density] and Los Serranos Golf Course [Low Density]) were included in the program-level analysis and not addressed herein. The remaining nine RHNA sites are examined at a more detailed, site-specific level. Building on the program-level analysis, the site-specific assessment included review of pertinent local reports, property-specific research, and archaeological and/or built environment field surveys.

8.1 California Historical Resources Information System Records Search

8.1.1 *Methods*

The site-level analysis of the RHNA sites utilized data obtained during the SCCIC records search and additional source information outlined above. The locational information for each resource identified during the General Plan Update record search was compared to each of the RHNA sites to determine if any resources overlapped.

Additional research completed specifically for the RHNA sites that contain properties over 45 years old included property-specific research such as, but not limited to, a review of historical maps, aerial photographs, building permit records, newspaper articles, and other archival documents obtained through various public sources, including the U.S. Geological Survey, Environmental Data Resources, UCSB Library, Calisphere, California State Library, Huntington Library, Newspapers.com, and Ancestry.com.

Four RHNA sites identified by the City are undeveloped (Sites 1, 5, 8, and 9), and three contain properties that are less than 45 years old (Sites 6, 7 and 10). Those properties within the RHNA sites that are presently developed, but are not yet 45 years old, contain buildings and/or structures that were constructed between 1999 and 2014, therefore, will not come of age until 2044 at the earliest.

8.1.2 *Results*

8.1.2.1 ARCHAEOLOGICAL RESOURCES

Results of the cultural resources records search indicate that 105 previous cultural resource studies have been conducted within the study area between 1973 and 2016. Seven of the 105 studies, completed between 1976 and 2011, overlapped one or more of the RHNA sites: one overlapped Site 1 – The Shoppes II, two overlapped Site 6 – The Shoppes, one overlapped Site 4 – Western Hills Country Club, one overlapped Site 7 – The Commons, one overlapped Site 8 – Canyon Estates (Medium Density), and one overlapped all 11 of the RHNA sites. Each previous study is detailed in Appendix A, Table A-1.

The CHRIS records search indicates that 142 cultural resources have been previously recorded within the General Plan study area (Appendix A, Table A-2). None of the 142 resources, however, are located within or intersect any of the 11 RHNA sites. A review of the California OHP's BERD identified an additional 11 built environment resources in the study area. None of the archaeological resources overlap any of the RHNA sites.

8.2 Native American Consultation

The Native American consultation for the site-specific analysis was encompassed by that completed at the program-specific analysis. In summary, two Native American groups had previously requested AB 52 consultation for all projects with the city: the Gabrieleño Band of Mission Indians – Kizh Nation and the Soboba Band of Luiseño Indians. On May 16, 2022, the City mailed letters to the two Tribes. On May 25, 2022, the Gabrieleño Band of Mission Indians – Kizh Nation responded, acknowledging the project's intent. The letter stated that they are not pursuing AB 52 consultation for the General Plan Update but requested consultation status for all future projects. To date, no additional requests for consultation have been received in response to the AB 52 notification letters.

On September 13, 2022, the City mailed letters to all 15 interested Native American groups and individuals included on the county-wide Tribal Consultation List. On September 19, 2022, the Gabrieleño Band of Mission Indians – Kizh Nation responded, acknowledging the project's intent. The letter stated that they are not pursuing SB 18 consultation for the General Plan Update but requested consultation status for all future projects. To date, no additional requests for consultation have been received in response to the SB 18 notification letters.

8.3 Archaeological and Built Environment Field Surveys

8.3.1.1 ARCHAEOLOGICAL RESOURCES

On August 17, 18, and 19, 2022, SWCA archaeologists Olivia Romansik and Jaime Wojak conducted an intensive and reconnaissance archaeological resources survey of seven of the 11 proposed RHNA sites. The archaeological survey included both intensive pedestrian survey consisting of walking over the project site using parallel transects spaced no more than 15 meters apart and reconnaissance survey, which consisted of examining accessible portion or areas of exposed ground surface, such as cut roads and pedestrian trails. Two RHNA sites (The Shoppes and The Commons) are fully developed, so pedestrian survey was not warranted. Additionally, two of the RHNA sites (Canyon Estates [Low Density] and Los Serranos Golf Course [Low Density]) are being analyzed at the program-level, therefore, no archaeological survey was completed at this time.

A Samsung computer tablet paired with a Geode global positioning system (GPS) antenna was used to locate the RHNA sites and maintain transect accuracy. The ground surface was examined for the presence of prehistoric artifacts (e.g., flaked stone tools, tool-making debris, or stone milling tools), ecofacts (e.g., shell, fire-affected rock, or bone), historic-era artifacts (e.g., metal, glass, or ceramics), sediment discoloration that might indicate the presence of a midden, depressions, and other features that might indicate the former presence of structures or buildings (e.g., post holes or foundations) or occupations (e.g., hearths or bedrock milling features).

Ground surface visibility within the seven RHNA sites subject to archaeological survey varied from fair to excellent (approximately 20 to 80 percent) (Figure 18 through Figure 24). No archaeological resources were identified within any of the RHNA sites as a result of the archaeological survey.



Figure 18. Site 1 – The Shoppes II, view south.



Figure 19. Site 2 – Community Park Overflow, view east.



Figure 20. Site 3 – Los Serranos Golf Course, view south.



Figure 21. Site 4 – Western Hills Country Club, view northeast.



Figure 22. Site 5 – Wang (High Density), view east.



Figure 23. Site 8 – Canyon Estates (Medium Density), view southwest.



Figure 24. Site 9 – Wang (Medium Density), view northwest.

8.3.1.2 ARCHAEOLOGICAL RESOURCES SENSITIVITY

The CHRIS records search did not reveal any previously recorded archaeological resources within or overlapping any of the 11 RHNA sites. The SLF results returned by the NAHC indicated that a record of a sacred site was identified within the study area. To date, no sensitive resources have been identified specific to the RHNA sites; however, Native American coordination conducted in support of the 2015 General Plan concluded that the entire city is sensitive for prehistoric resources (Gust and Valasik 2011). Although no archaeological sites have been previously or newly identified within the RHNA sites, the RHNA site areas are located in the vicinity of known Native American villages, and the area was occupied and developed throughout the historic period.

8.3.1.3 BUILT ENVIRONMENT RESOURCES

In the assessment of built environment resources, the threshold of 45 years of age is typically used to comply with CEQA due to the typical length of time a project takes to complete the environmental review process prior to approvals and construction.

Of the 11 RHNA sites, two contain properties over 45 years old: Los Serranos Golf Club (RHNA Site 3 and Site 11) and Western Hills Country Club (RHNA Site 4). These two properties underwent an intensive-level built environment survey, and were recorded and evaluated for potential historic significance using the criteria of the NRHP and CRHR. In summary, neither the Los Serranos Golf Club nor the Western Hills Country Club appear eligible for listing at the federal or state level under the applicable criteria. Summaries of the evaluations are provided in the sections below.

(RHNA Site 2 – Community Park Overflow is adjacent to and north of a property that is over 45 years old: 14566 Peyton Drive, an agricultural property that was developed in 1920. The property was evaluated for potential historic significance in 2005 and assigned California Historical Resource Status Code 6Y meaning it was determined not eligible for the NRHP by consensus through the Section 106 process, but was not evaluated for the CRHR or for local listing (California OHP 2022b). As it is outside the project area, the property was not reevaluated for this report.)

The remaining RHNA sites identified by the City are either undeveloped (Sites 1, 5, 8, and 9) or contain properties that are less than 45 years old (Sites 6, 7 and 10). Those properties within the RHNA sites that are presently developed, but are not yet 45 years old, contain buildings and/or structures that were constructed between 1999 and 2014, therefore, will not come of age until 2044 at the earliest.

On July 5, 2022, SWCA Architectural Historian Susan Zamudio-Gurrola, M.H.P. conducted a built environment survey of the proposed RHNA sites containing built environment resources: the Los Serranos Golf Club and Western Hills Country Club. The field survey consisted of an inspection of all built environment features within the site boundaries. Photographs and notes were collected to document the existing conditions and observations on the properties' construction, materials, alterations, overall integrity, and potential character-defining features.

8.3.1.4 LOS SERRANOS GOLF CLUB

Current Status

Based on a review of records search results, the BERD, and additional background research, the Los Serranos Golf Club is not listed in the NRHP or the CRHR. The property was not identified as a potential cultural resource in the City's 2015 General Plan or the associated cultural resources study. It appears the property has not been previously evaluated for potential historic significance.

Physical Description

The Los Serranos Golf Club is situated on multiple parcels totaling approximately 312 acres. Generally L-shaped, the golf club includes a section oriented north-south parallel to Yorba Avenue, and a section oriented east-west. The facility includes two 18-hole courses—the 6,691-yard north course, and the 7,628-yard south course (Los Serranos Golf Club 2018a, 2018b)—a driving range; putting green; clubhouse; golf cart, starter, maintenance, ancillary, and two snack bar buildings; sand traps; a large water hazard near the southwest end of the property; and numerous paved paths. A paved parking lot is adjacent to and north of the clubhouse, and is enclosed by a low concrete block wall that is painted white. A wooden sign located near the curb announces, "Jack Kramer's Los Serranos Country Club" and displays a man on horseback. The golf course terrain is undulating, and features many mature trees (Figure 25). The surrounding setting includes residential development in all directions, as well as an area of open space to the west.

Clubhouse

The clubhouse was constructed in 1996. Built in a contemporary Mission Revival style, the clubhouse is one story with high ceilings (Figure 26 and Figure 27). It rests on a concrete foundation and has an irregular footprint. A hipped, tiled roof with markedly protruding rafter rails covers the majority of the building, while the center is flat roofed to support mechanical equipment and is edged at the north façade with a stepped, stuccoed parapet. The building exterior is sheathed in smooth stucco. Projecting from the north façade is a porte cochere supported by large, smooth columns and topped by a short tower. The tower is capped by a hipped, tiled roof with protruding rafter tails, and displays arched openings with metal bells suspended from wooden beams. Accessed via the porte cochere, the primary entrance consists

of wooden double doors with glazing and is surrounded by a transom and wide sidelights. The north façade and east elevation display broad blind arches with no or minimal windows, concealing the view to the parking lot. Fenestration is concentrated on the west and south elevations facing the golf course, and consists of large expanses of metal-framed windows.

Starter Building

Located southwest of the clubhouse is a small wood-frame building where the starter (a staff person) directs players to the first tee at the appropriate time. The building has a square footprint and rests on a concrete foundation (Figure 28). It has a hipped, tiled roof with widely overhanging eaves and closed soffits. The lower half of the building exterior is covered with textured stucco, and is topped by metal-framed fixed and sliding windows on all sides. Th entry door on the south elevation appears to be wooden with a single-hung aluminum-framed window. The starter building's construction date was not ascertained but is believed to be ca. 1975.

Snack Bar Buildings

There are two small snack bar buildings on the golf course, one within the north course, and one within the south course. The small buildings have rectangular plans and are clad with smooth river rock. These buildings were not documented in detail. Their construction date was not ascertained but is believed to be ca. 1990.

Maintenance Building

Constructed ca. 1960, the maintenance building is located southwest of the clubhouse, near the southeastern edge of the golf club property. Sited around a maintenance yard, the building has a U-shaped footprint (Figure 29). It is similar in design to the clubhouse, displaying a contemporary Mission Revival style. The building is topped by a gable-on-hip roof clad with red barrel tile. Its exterior is sheathed in textured stucco and displays blind arches with wide engaged pilasters on the north elevation. The elevations facing inward towards the maintenance yard display numerous metal roll-up garage doors. Wide engaged pilasters separate each garage door.

The maintenance building was constructed between 1959 and 1966 with a L-shaped footprint, and the eastern wing was built between 1987 and 1994, making the U-shaped footprint (NETROnline 1938–2020).

Ancillary Building

Constructed ca. 2000, the ancillary building is located north of the parking lot near Yorba Avenue. Although not clearly visible due to fencing and foliage, it has a rectangular footprint and walls composed of light gray textured brick or block (Figure 30). It is topped by a gabled roof clad with red barrel tile. There is a decorative metal vent screen under the gable peak.



Figure 25. Los Serranos Golf Club overview near Hole 8, view facing west.



Figure 26. Los Serranos Golf Club entrance and clubhouse, view from Yorba Avenue, facing west.



Figure 27. Los Serranos Golf Club clubhouse, north elevation, view southeast.



Figure 28. Los Serranos Golf Club starter building, south and east elevations, view southwest.



Figure 29. Los Serranos Golf Club maintenance building, north elevation, view south.



Figure 30. Los Serranos Golf Club ancillary building, east elevation, view west.

Development History

The Los Serranos Country Club was conceived in 1923 by a group of investors headed by Harlow C. Davidson, a Long Beach real estate developer. In December 1923, the group purchased approximately 750 acres of the former Rancho Santa Ana del Chino, a Mexican-period land grant, from the Chino Land and Water Company (*Long Beach Press-Telegram* 1924a; Spitzzeri 2020b).

Rancho Santa Ana del Chino was granted in 1841 to Antonio Maria Lugo, a former soldier under the King of Spain (Barrows 1914; Shumway 2007). Soon thereafter, he turned over management of the rancho to Isaac Williams, who had married Lugo's daughter María de Jesús in 1839. Williams eventually purchased the rancho from Lugo for $10,000 (*Long Beach Press-Telegram* 1924a). After Williams' death in 1856, his daughter Francisca Williams MacDougall hired her brother-in-law Joseph Bridger to manage the ranch, as she lived in Los Angeles. Bridger was married to Francisca's half-sister, Victoria Regina Williams, who was Isaac Williams' daughter with María Antonia Apis. Bridger built an adobe house on a portion of the property called the "Home Ranch" (on which the Los Serranos Golf Club is located today). He managed the ranch from 1865 until his death in 1880 (Spitzzeri 2018a, 2018d, 2020b). The following year, Francisca sold the ranch to the mining tycoon Richard Gird, who moved with his wife Nellie into Bridger's adobe house. Gird raised horses and cattle, many of which grazed in the Chino Hills; expanded agricultural crops; and established the Chino townsite. By the early 1890s, Gird was financially overextended, took out a loan, and assertively sought to sell portions of the ranch. Ultimately, a group of investors (which included Phoebe Apperson Hearst, mother of William Randolph Hearst) formed the Chino Land and Water Company and took over Gird's mortgage. A subsidiary company liquidated the ranch's assets. In late 1923, the company sold a large portion of the ranch to Davidson and the group of investors who developed the Los Serranos Country Club (Spitzzeri 2019a, 2019b, 2020b).

As described in local newspapers at the time, the investors acquired 750 acres that included a 40-acre lake, waterfall, and a 20-acre park area with exotic trees planted in the late 1800s. California redwood trees and a Japanese garden were noted. The planned country club was to include two 18-hole golf courses; a polo field; and facilities for swimming, boating, and other outdoor sports (*Long Beach Press-Telegram* 1924a, 1924c).

The country club was "named after the peaceful Serranos Indians that lived there long before white men with beards and lances trod upon California's garden lands." (*Long Beach Press-Telegram* 1924b). Directing the club's development was W.G. Hamilton, who had been involved in several other country clubs in the Southern California area. John Duncan Dunn was hired to design the golf courses (*Long Beach Press-Telegram* 1924a).

Los Serranos Country Club officially opened April 25, 1925 (*Colton Daily Courier* 1925). The former Bridger/Gird adobe house, described as a "large, aristocratic mansion," was enlarged and remodeled to repurpose it as a clubhouse (*Long Beach Press-Telegram* 1924c; *San Bernardino Daily Sun* 1925) (Figure 31). An announcement of the grand opening stated the "Feature event of the day will be the dedication of the 18-hole championship links" indicating the second planned 18-hole course was not built (*Colton Daily Courier* 1925). The original driving range was located where the parking lot is today (Miranda 2022). Rental cabanas were built south of the clubhouse (Figure 32), although their exact construction date was not determined. The country club property also included present-day Lake Serranos to the north.



Figure 31. The original clubhouse and former Bridger/Gird adobe building (no longer extant) (Source: Spitzerri 2020b; California State Library, n.d).



Figure 32. Clubhouse off the entry drive (near top) and what appear to be the cabanas to the southwest in 1935 (Source: UCSB Library 1935).

Only a year after its opening, in 1926, H.C. Davidson's investment company sold the country club to a syndicate composed of club members described as out-of-towners. The sale included 350 acres of the club property and 350 acres of surrounding land. In this way, members would participate in the club's administration and financial management. Participating memberships were sold to those who desired them. It was also announced at the time that nearby land would be developed as a community of country homes (*Chino Champion* 1926a, 1926b). Members of the club were able to purchase small lots adjacent to the course (City of Chino Hills n.d.). Streets were named after historical figures and places such as Lugo and Gird Avenues and Los Serranos Boulevard. It appears the homes were modest in scale, as they were locally referred as bungalows (*Chino Champion* 1927a, 1937). Early homes built in this area, along with Sleepy Hollow in Carbon Canyon, were some of the earliest in what would later become the City of Chino Hills (City of Chino Hills 2015a). However, the lots adjacent to Los Serranos Golf Course were developed rather slowly. In 1935, only a handful of homes had been built, and in 1946, the area was still very sparsely developed ((Figure 33 and Figure 34). The lots gradually filled in and it was not until about 1980 that the area appeared nearly built out (NETROnline 1938–2020).



Figure 33. Only a handful of homes had been built in the lots adjacent to the Los Serranos Golf Club by 1935 (Source: UCSB Library 1935).



Figure 34. The lots adjacent to the Los Serranos Golf Club were still sparsely developed in 1946 (Source: UCSB Library 1946).

With the ownership change, several improvements were planned, including rearranging Holes 1 and 9 to be closer to the clubhouse, and construction of a swimming pool, a new golf house, and an ornamental gate and lodge at the entrance (*Chino Champion* 1926c). However, it appears some of these improvements were not immediately started, and just 1 year later, a new owner for the country club was announced. O.W. Heinz and associates, based in Los Angeles, acquired the country club by November 1927. It was then that major improvements seemed to get underway. The contract was authorized for a 60 by 125-foot swimming pool (although research to date has not determined its location on the property), an outdoor dance pavilion was constructed, and a 2,000-foot-long swimming beach on the lake was developed. Additionally, a toboggan slide and water wheel were installed at the beach, and water was fed into the arroyos to allow for canoeing and to create water hazards for the golf course (*Chino Champion* 1927b).

The country club changed hands many times through the mid-century, and was referred to by different names, including Rancho Don Lugo Golf Course, and Pomona Valley Country Club. While the details of each transaction and owner were not definitively ascertained, research to date revealed that a syndicate headed by Gordon Bell bought the property in 1946 for $155,000. The syndicate was composed of Mr. and Mrs. Gordon Bell, Mr. and Mrs. Gray Phelps, Mr. and Mrs. John W. Dawson, Kersey Kinsey, and R. Glenn Daugherty. By 1948, the property was sold to either Mel and Connie Rogers or Mel's brother Ken Rogers (depending on the source). Ken, who was a retired Army officer and golfer, was originally from Dallas but moved around extensively during his time in the military. It is not clear if Ken's brother Mel served as manager of the golf club, was a co-owner, or outright owner with Connie (*Chino Champion*

1948a, 1948b; *San Bernardino County Sun* 1953; Spitzzeri 2021). Mel and Connie Rogers experienced legal issues with the California Public Utilities Commission, and in addition, Ken Rogers and realtor Clara Blum Bartlett sued Mel and Connie, resulting in a judgment in late 1948 that gave Ken Rogers and Clara Bartlett control of the club. Subsequently, Bartlett acquired Ken's half-interest and gained full control of the club (*Chino Champion* 1953a; *San Bernardino County Sun* 1953; Spitzzeri 2021).

Not long after the Rogers acquired the club, they sought to sell the property, and in mid-1949, it was announced that a group of African-American investors were seeking to purchase it. Headed by Lemuel Pratt Grant, the group was reported to include boxer Joe Lewis, actor Eddie Anderson, and athlete Woody Strode. Grant owned a brick and tile business and was a pioneer golfer in the African-American community. Opposition quickly rose in the community—an organization was formed called "Los Serranos Business Club," which worked to block the sale. Despite a well-attended event to publicize the club and sign up new members, the property sale fell apart (*San Bernardino County Sun* 1953; Spitzzeri 2021).

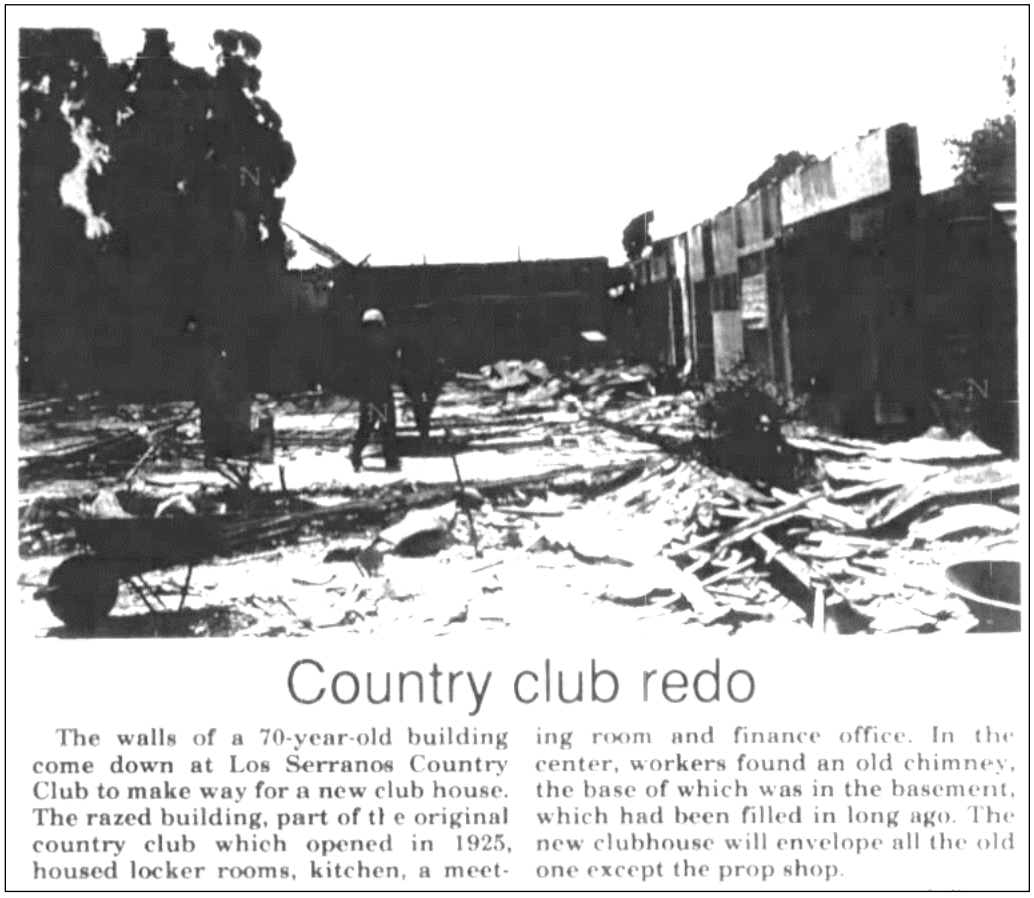
During her tenure, Bartlett completed at least $50,000 in improvements and remodeling to the clubhouse, and had plaques installed on trees that she discovered were not indigenous and were rare to the area. However, problems with the water system and related water shortage resulted in the golf course being maintained in less than ideal conditions (*Chino Champion* 1950, 1953a, 1953c). In June 1953, Bartlett sold the country club—which had been reduced to 320 acres—and its water system to Paul Greening, who owned the adjacent approximately 2,500-acre ranch (referred to as Rolling Ridge or Rolling Hills). Greening was a rancher with a number of other financial interests who had recently relocated to the area from Newport Beach (*Chino Champion* 1953a; *Pomona Progress Bulletin* 1953; *San Bernardino County Sun* 1953). Shortly after the purchase, Greening closed the golf course, but began making improvements to the water system (*Chino Champion* 1953b). He offered the golf course and clubhouse for lease, and indicated that if a lease was not arranged, the course would be converted to agricultural purposes and the clubhouse would be torn down (*Los Angeles Times* 1953a).

By late 1953, a lease was arranged with a group composed of tennis professional Jack Kramer, golf professional Zell Eaton, and Pasadena businessman W.E. Cranston (*Los Angeles Times* 1953b). The men updated the golf course and reopened it for public use in February 1954 with nine holes. A temporary grouping of holes was created to put the course into operation, but they were not meant to be a permanent front or back nine. Additional changes were made to the course with the goal "to make it appeal more to the average golfer" (*Pomona Progress Bulletin* 1954). It was designed to be easier and shorter than the previous course, and several new greens were constructed (*Pomona Progress Bulletin* 1954). The *Los Angeles Times* provided a summary of the state of Los Serranos at the time:

> The course was in horrible condition, almost abandoned…It has been redesigned, eliminating several of the less interesting holes at the southwest end of the course…and building some new holes including an 18th which will be directly in front of the clubhouse. Overall length is considerably shorter than the old course. Nine holes were opened a short time ago…Fairways are pretty rough now but an entirely new watering system…should begin to pay off. We'd say the net result of the changes will be to make it an easier course for high handicappers but just as interesting as the old layout. (Curtis 1954)

By 1961, Jack Kramer became sole owner of the club (Los Serranos Country Club 2021). He developed a second golf course, called the south course, in 1962. It became known as "Jack's Blacks" and held the record for the longest golf course in California until surpassed by Torrey Pines and Martis Camp in the 2000s (Youngman 2020). The maintenance building was constructed around this time with a L-shaped footprint, and the eastern wing was built between 1987 and 1994, creating the building's current U-shaped footprint (NETROnline 1938–2020). Building permit records show that a permit was issued in

1994 that included an addition and remodel of the clubhouse, as well as demolition work (Figure 35). While the building permit does not provide details on the demolition, a local newspaper account indicates the original clubhouse was razed (*Chino Hills Champion* 1994). Los Serranos Golf Club staff also indicates the current clubhouse is all new construction (Miranda 2022). The project included 3,800 square feet of office space, 4,645 square feet of clubhouse space, and 8,100 square feet of kitchen space and patios. The architect for the project was Schneider Architects and Associates, and the contractor was Charles Licha (City of Chino Hills 1994 – 2016).



Country club redo

The walls of a 70-year-old building come down at Los Serranos Country Club to make way for a new club house. The razed building, part of the original country club which opened in 1925, housed locker rooms, kitchen, a meeting room and finance office. In the center, workers found an old chimney, the base of which was in the basement, which had been filled in long ago. The new clubhouse will envelope all the old one except the prop shop.

Figure 35. Demolition of the original clubhouse in a 1994 photograph (Source: *Chino Hills Champion* 1994).

The Greening family (Jay Greening) continues to own the property, and while Jack Kramer died in 2009, the Kramer family continues to own and operate the golf club business, leasing the land from Mr. Greening (Goldstein 2009; Napoles 2018).

The changes and alterations that have taken place at the property over the decades have resulted in a nearly 50 percent reduction of its size, from the original 750 acres to approximately 320. In addition, the property's features have been affected by the substantial changes in the function and amenities provided at the course. Original features that were removed or are no longer part of the property include the lake, beach, and water toboggan; equestrian facilities; rental cabanas; and the original clubhouse. The golf facility has changed from a single 18-hole golf course to two 18-hole golf courses, with the second course developed 37 years after the original. Additionally, the configuration and features of the original north course have been altered, notably the locations of Holes 1, 2, 5, 6, 16, 17, and 18, and the driving range

(Google Earth 2022; Miranda 2022; UCSB Library 1937). New buildings were constructed on the property through ca. 2000.

Golf Course Architect/Designer

John Duncan Dunn, a native of Scotland, came from a well-known golfing family of which his father, uncle, grandfather, mother, and brother were all involved in golf—either as players, professionals, or designers. Dunn established a club-making business with his brother in 1892, and laid out many early golf courses in the Netherlands. In 1895, he took a trip to America, and later returned to join his uncle at the Ardsley-on-Hudson Country Club. Among his various golf-related business endeavors, Dunn opened a shop in Manhattan, and took over his uncle's position as the manager of the BGI Company. Dunn began making a name for himself in golf course design after working on several courses in Florida. In 1902, he moved to California, and served as a golf professional at Los Angeles Country Club. Dunn left for some time to work in France, but returned to the United States, after which he designed courses in Lake Tahoe and at Los Serranos. Dunn also wrote articles and instructional books about the sport (Antique Golf Clubs from Scotland 2021; Mckinnon, n.d.). Dunn designed the original (north course) at Los Serranos; however, the second planned course was not constructed (Golf Club Atlas 2004–2016). Dunn died in 1951 (GolfPass 2022a).

As part of the research undertaken for this study, several sources were consulted to review rankings of golf course architects/designers, including Top 100 lists (Top 100 Golf Courses 2019), and those identifying influential golf course architects/designers. These sources included the American Society of Golf Course Architects Architect's Gallery database (2022), Golf magazine (2020), Golf Digest (2013), Golf Link (2022a, 2022b), and Golfweek (2021). John Duncan Dunn was not identified in any of the sources consulted. A discussion of Dunn's work in another source indicated that, while Dunn appears to have been involved in the creation of more golf courses in California than he has been given credit for, his work may not measure up to some of the other work in Southern California around the same period (Golf Club Atlas 2004–2016).

Courses attributed to a golf course architect/designer are typically categorized by solo designs, collaborations with other designers, new courses, and remodels of existing courses. Table 1 presents known information on John Duncan Dunn's work. Research to date does not indicate that Dunn is considered a master in his field.

Table 1. Known Golf Courses Associated with John Duncan Dunn

Golf Course Name	City	Year	Involvement	Source
Catalina Island Golf Club	Avalon, California	1892	Designer	GolfPass 2022a
Ekwanok Country Club	Manchester, Vermont	1900	Designer	GolfPass 2022a
Essex Country Club	Manchester-by-the-Sea, Massachusetts	1908	Designer	GolfPass 2022a
Indian Hill Country Club	Newington, Connecticut	1899	Designer	GolfPass 2022a
Los Serranos Golf Club North Course	Chino Hills, California	1925	Designer	GolfPass 2022a
Old Brockway Golf Course	Kings Beach, California	1926	Designer	GolfPass 2022a
Quaker Ridge Golf Club	Scarsdale, New York	1915	Designer	GolfPass 2022a
Rio Hondo Golf Club	Downey, California	1924	Designer	GolfPass 2022a
Santa Ana Country Club	Santa Ana, California	1923	Designer	GolfPass 2022a

NRHP and CRHR Evaluation

Criteria A/1 (Events)

The Los Serranos Golf Club (aka Los Serranos Country Club) was originally developed in 1924 as a private country club with expansive recreational facilities, including one 18-hole golf course, facilities for fishing and water sports, a private lake with a beach, rental cabanas, and equestrian facilities. Changing hands many times from its opening in 1925 through the 1950s, the property and its owners appear to have struggled to maintain a successful business. Although the Los Serranos Golf Club property is associated with the development of early recreational facilities in the Chino Hills, the country club was not remarkable as a business, as evidenced by the frequent ownership changes, known maintenance issues, and elimination over the years of amenities such as the rental cabanas and equestrian and water sports. In the course of the various sales of the property, the country club was also reduced in size such that the lake feature is no longer part of the current club property. The club's use changed so that it is now focused only on the sport of golf.

The golf club property is associated with the development of early residential properties in the Chino Hills area on the lots adjacent to the golf course, which were originally purchased by club members. However, the lots were developed very slowly over the course of several decades. The sale of land for the development of homes was announced in 1926, but the neighborhood was less than half built 20 years later in 1946. It was not until about 1980 that the neighborhood appeared to be nearly built out. As stated in the Chino Hills General Plan (adopted February 2015), only 5 percent of the homes in the Los Serranos neighborhood predate 1945, and over 50 percent were built after 1970. Furthermore, the city of Chino Hills did not incorporate until 1991 following a period of extensive growth in the 1970s and 1980s. Therefore, while the country club made lots available for residential development early in the twentieth century, it cannot be said that the country club was a strong catalyst for the growth and establishment of the city of Chino Hills.

Lastly, research to date does not indicate that any events significant in our history have occurred at the property.

Consequently, the Los Serranos Golf Club does not appear eligible for listing in the NRHP under Criterion A or the CRHR under Criterion 1.

Criteria B/2 (Individuals)

Research to date has not demonstrated that the Los Serranos Golf Club is associated with the lives of persons important to local, state, or national history. The golf club property does not appear eligible under NRHP Criterion B or CRHR Criterion 2.

Criteria C/3 (Design/Construction)

The Los Serranos Golf Club does not appear to be eligible under Criteria C/3 as it does not embody the distinctive characteristics of a type, period, region, or method of construction, or represent the work of a master, or possess high artistic values. Due to numerous changes to the property, the club does not have a cohesive design. The extant clubhouse and maintenance building represent a contemporary Spanish Revival style from the buildings' remodeling in the early 1990s. Other buildings on the property such as the ancillary and snack bar buildings do not have a clearly discernible style. As previously discussed, research to date does not indicate that Dunn, the golf course designer, is considered a master in his field. The original north course's configuration and features have been considerably altered as described above—the locations of Holes 1, 2, 5, 6, 16, 17, and 18 and the driving range have been changed, and a second course was built adjacent approximately 37 years after the original course was developed.

Coupled with the changes to the golf course–related buildings, the north course does not retain integrity to convey its original design, construction, materials, workmanship, or feeling.

Criteria D/4 (Information Potential)

The potential to yield information important to prehistory or history is typically applied to archaeological resources and these criteria were not applied to this evaluation of the Los Serranos Golf Club.

In summary, the Los Serranos Golf Club is not considered a historical resource pursuant to CEQA.

8.3.1.5 WESTERN HILLS COUNTRY CLUB

Current Status

Based on a review of records search results, the BERD, and additional background research, the Western Hills Country Club is not listed in the NRHP or the CRHR. The property was not identified as a potential cultural resource in the City's 2015 General Plan or the associated cultural resources study. It appears the property has not been previously evaluated for potential historic significance.

Physical Description

The Western Hills Country Club is situated on multiple parcels totaling approximately 312 acres. Generally L-shaped, the country club includes a section oriented northeast-southwest parallel to Carbon Canyon Road, and a section oriented north-south. The southwestern end of the golf course extends to the west side of Canon Lane. The club includes an 18-hole course that is just over 6,700 yards long (Golf Link 2022a), a driving range, putting green, clubhouse, golf cart and maintenance buildings, a swimming pool, and numerous paved paths. A paved parking lot, adjacent to and south of the clubhouse, is accessed from Fairway Drive where the entrance is marked by four brick pillars with black iron gates, and a post-mounted sign announcing the Western Hills Country Club. The golf course terrain is undulating, and features many mature trees and a small lake northwest of the clubhouse. The surrounding setting includes Eucalyptus Avenue and residential development to the north; Fairway Drive, residential development, and open space to the east; Carbon Canyon Road, Chino Valley Fire Station No. 4, a golf cart shop, and residential development to the south; and residential development to the west.

Clubhouse

The clubhouse was originally built as a stock show and sales barn in 1961, remodeled in 1963 to use as a clubhouse, and partially demolished and remodeled again in 1988. Designed in a contemporary Spanish Revival style, the clubhouse is one story with high ceilings. It rests on a concrete foundation and generally has a rectangular footprint. The southern half of the building is covered by a flat roof edged by a hipped, tiled roof that conceals mechanical equipment. The northern half of the building is covered by a very low-pitched gabled roof which appears to be clad with composite shingles. The building exterior is sheathed in smooth stucco. An arcade with wide square piers spans the southern façade. At the eastern end of the façade, a gabled roof shelters the primary entrance, which consists of steel arched double doors flanked by sidelights. Secondary doors are located on the west and north elevations. Fenestration consists of large steel-framed fixed windows, smaller sliding windows, and possibly awning or fixed windows on the north elevation (Figure 36 and Figure 37).

Golf Cart Building

Constructed in 1990, the golf cart building is located north of the clubhouse near Fairway Drive. It has a rectangular footprint and a flat roof with composite shingles and numerous skylights. A concrete path surrounds the building on all sides.

Pool House/Shower Building

Constructed ca. 1964, this small ancillary building is located north of the pool. It has a rectangular plan and a medium-pitched, side-gabled roof clad with composite shingles. Although not clearly visible due to the pool security fencing, it appears to be sheathed in stucco, and has at least one vinyl-frame sliding window. The south elevation displays a recessed niche with a shower (Figure 38).

Swimming Pool

Constructed ca. 1964, the swimming pool is located east of the clubhouse, near Fairway Drive. It is an irregularly shaped swimming pool surrounded by a concrete path and patio, and grass lawn. The pool facility is enclosed by an iron rail fence (Figure 39).

Restroom Building

The restroom building's construction date is unknown. This small building is located on the west side of Canon Lane, near the western end of the country club. The building has a rectangular footprint and a very low-pitched gabled roof. Wide wooden fascia boards show considerable deterioration. The exterior walls are masonry blocks painted tan. Privacy screening walls shield the doorways to the restroom facilities inside (Figure 40).

Development History

The Western Hills Country Club was opened in March 1963 on the lands of a former cattle ranch. Known as the "Double S Ranch," the property was owned by Shelley Martin Stoody and his wife Corrine Stoody. Mr. Stoody was known for his prized, expensive Hereford cattle (one of which he purchased in 1958 for $55,000); he also was said to have held a quarter interest in a bull valued at $320,000. In 1960, Stoody constructed a show ring and barn in which to display his cattle stock for sale.

His property also included a landing strip, which was subsequently related to his cause of death in June 1961, when he died in a plane crash near his home. Three other passengers were also killed, and several damage suits were filed against Stoody's estate. The court authorized the sale of the ranch, and in 1963, it was purchased for $600,000 by a group of investors from surrounding cities who planned the development of a country club on a portion of the 380-acre property (*Chino Champion* 1961, 1963a, 1963c).



Figure 36. Clubhouse, south façade and east elevation, view looking northwest.



Figure 37. Clubhouse, north elevation, view looking southwest.

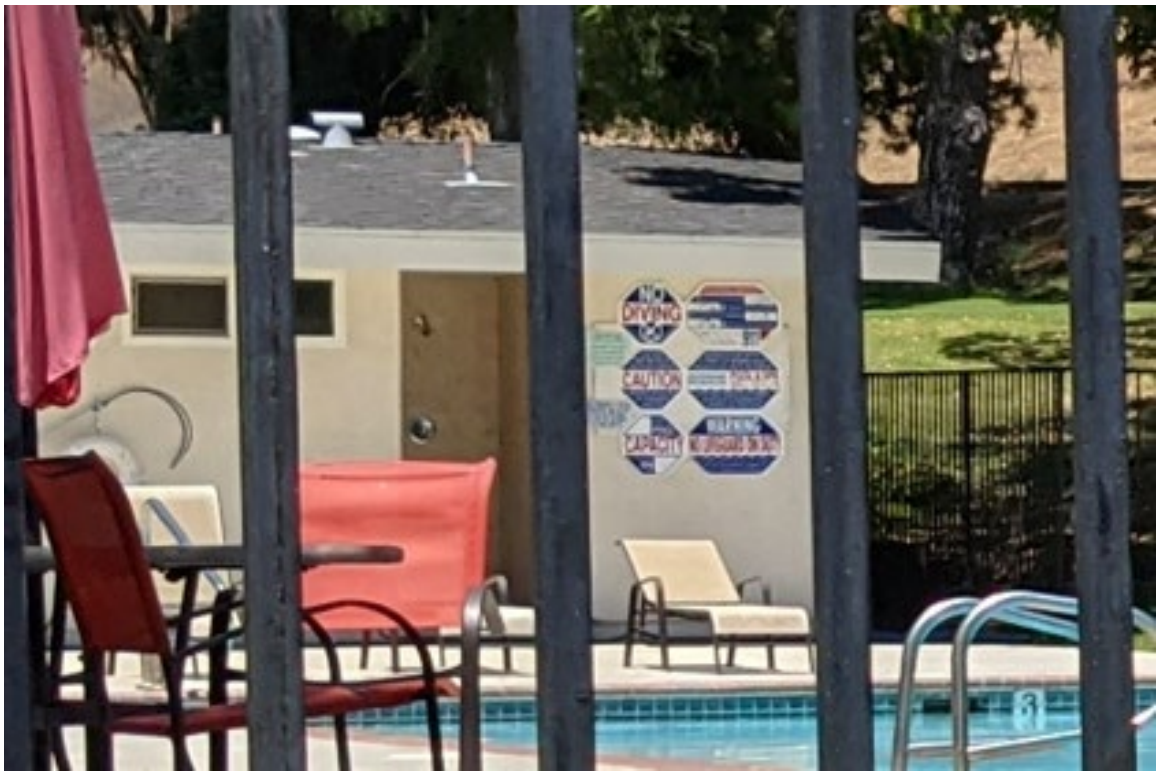


Figure 38. Swimming pool building, view looking north.



Figure 39. Swimming pool, view looking northeast.



Figure 40. Restroom building, west and north elevations, view looking east.

The group of investors included Delmar Pebley, president; William G. Claussen, vice president and acting manager; Dr. G. Barton Heuler, treasurer; and Dr. L. Kenneth Heuler, secretary. Opening in March 1963, the Western Hills Country Club included an 18-hole golf course, a driving range, and a practice green near the clubhouse. Nine holes were sited along the canyon beside Carbon Canyon Road, and nine were sited in the valley running northward from the property entrance. Between the No. 10 and No. 18 fairways was a small lake. Stoody's approximately 14,500-square-foot cattle sale barn was renovated and converted into a clubhouse with a pro shop, control room, bar, kitchen, dining, banquet and locker rooms, and offices. Two hangars on the ranch property were also repurposed. A 40 foot by 40–foot hangar located near the clubhouse was used to store golf carts; a second 40 foot by 60–foot hangar was relocated near Carbon Canyon Road across from the Mountain View tract to store maintenance equipment. The landing strip and several buildings were removed, including a barn and two smaller buildings near the entrance. Additional amenities planned for the property included tennis, badminton, and ping pong courts in support of the family-focused program of the country club (*Chino Champion* 1961, 1963a, 1963b, 1978). It is unknown if these features were built. A swimming pool was constructed east of the clubhouse shortly after the club opened (NETROnline 1938–2020).

It appears the investor group later developed the Western Hills Mobile Homes Estates on the east side of Fairway Drive (*Chino Champion* 1978). A portion of the undeveloped ranch property to the north and west of the country club was sold for construction of a housing tract (Spitzzeri 2014).

Sparse data was available to trace the ownership history of the property over the decades—city building permit records redact owner information for privacy reasons. A general partnership was identified in association with the Western Hills Country Club in 1986, which consisted of T.W. Dutton and George D. Voigt of Upland, Jacob Y. Terner of Beverly Hills, and Robert D. Dutton of Ontario (*Chino Champion* 1986).

Jacob Y. Terner was born in New York in 1934. He married Sandra Wolloch, obtained his M.D. in 1961, and practiced in New York until 1966 when he entered the military, serving until 1968. Afterwards, Terner and his family moved to Los Angeles where he founded a private pathology practice. He also founded and ran several business entities and taught at the University of Southern California School of Medicine (Legacy 2022). Terner's partners, George D. Voigt and T.W. Dutton, were born in 1932 in Upland, California and 1930 in Rancho Cucamonga, California, respectively. Born in 1950, partner Robert D. Dutton was originally from Ontario, California. No consequential information was found on Voigt or either Dutton.

The country club was acquired in March 1987 by Western Hills Golf Associates, who completed improvements to the property and remodeled the clubhouse (*Chino Champion* 1988). The clubhouse was partially demolished by removing the pro shop, restaurant, bar, and banquet room, then enlarged by approximately 1,000 square feet. The kitchen was moved, a larger bar and grill room was created, the locker rooms and banquet room were refurbished, and views to the outdoors were improved. Additionally, as part of the remodel, the building exterior was redesigned to give it a "California Spanish look" (*Chino Champion* 1988).

Further improvements were completed shortly thereafter. A garage building near the clubhouse (likely the former ranch building near the clubhouse that had been repurposed to store golf carts) was demolished in 1989. A new golf cart storage building was constructed by the following year at the same location north of the clubhouse. Other work conducted on the property in the 1990s included walls built at the perimeter of the property, remodeling of the locker area, and installation of a new fuel tank at the maintenance building. Work conducted in the 2000s included repairs to a damaged portion of the north locker room wall, electrical work for the pond and irrigation system, installation of a prefabricated structure to house cell-site equipment, and installation of a sewer line (City of Chino Hills, var.).

In ca. 2001, West Hills Golf Associates, Ltd., coordinated with the City to have Fairway Drive accepted into the city-maintained street system in exchange for waterline easements through the country club property, and a 1.2-acre parcel given to the City for a park at Carbon Canyon Road and Cannon Lane (City of Chino Hills 2018). It appears the property owner has remained the same; the San Bernardino County Assessor lists the present owner as West Hills Golf Associates, Ltd., which was formed in 1987 (Dun & Bradstreet 2022; San Bernardino County Assessor-Recorder-Clerk 2022).

Golf Course Architect/Designer

Harry Rainville, a golf course architect based out of Yorba Linda, designed the country club's 18-hole golf course (*Chino Champion* 1963b). Rainville was born in 1905 in St. Onge, South Dakota. Research conducted for this study did not uncover consequential information on Rainville. He worked on the design of golf courses in various California cities, as well as on several projects with his son David Rainville, who continued practicing golf course architecture into the 2000s (American Society of Golf Course Architects 2022). Harry died in 1982 (GolfPass 2022b).

As part of the research undertaken for this study, several sources were consulted to review rankings of golf course architects/designers, including Top 100 lists, and those identifying influential golf course architects/designers. These sources included the American Society of Golf Course Architects Architect's Gallery database, Golf magazine, Golf Digest, Golf Link, and Golfweek. Harry Rainville was not identified in any of the sources consulted. Courses attributed to a golf course architect/designer are typically categorized by solo designs, collaborations with other designers, new courses, and remodels of existing courses. Table 2 presents known information on Harry Rainville's work. Research to date does not indicate he was associated with any significant golf course designs or considered a master in his field.

Table 2. Known Golf Courses Associated with Harry Rainville

Golf Course Name	City (California)	Year	Involvement	Source
San Diego Country Club	Chula Vista	1921	Appears to have worked with William P. Bell and Ronald Fream. William P. Bell is often credited with this golf course.	Golf Link 2022b; GolfPass 2022b
Candlewood Country Club	Whittier	1953	Designer	GolfPass 2022b
Yorba Linda Country Club	Yorba Linda	1957	Designer	GolfPass 2022b
Rivers Edge Golf Course	Needles	1960	Designer	GolfPass 2022b
Chevy Chase Country Club	Glendale	1960	Remodel after William F. and William P. Bell's original design in 1926.	Golf Course Ranking 2022
El Rancho Verde Country Club	Rialto	1960	Designer	Golf Course Ranking 2022
Rivers Edge Golf Course	Needles	1961	Designer	Golf Course Ranking 2022
Alta Vista Country Club	Placentia	1961	Designer	GolfPass 2022b
Chula Vista Golf Course	Bonita	1961	Designer	GolfPass 2022b
National City Golf Course	National City	1961	Designer	GolfPass 2022b
Fallbrook Golf Club	Fallbrook	1962	Designer	Golf Course Ranking 2022
Ocean Meadows Golf Course	Goleta	1963	Worked on with son David Rainville.	Golf Course Ranking 2022
Panorama Village Golf Course	Hemet	1965	Designer	GolfPass 2022b
Morgan Run Resort and Club	Rancho Santa Fe	1965	Worked on with his son David Rainville.	GolfPass 2022b
Escondido Country Club	Escondido	1965	Worked on with son David Rainville.	Golf Course Ranking 2022
Birch Hills Golf Course	Brea	1972	Worked on with son David Rainville.	Golf Course Ranking 2022
El Prado Golf Courses	Chino	1970, 1976	Worked on with son David Rainville.	Golf Course Ranking 2022
Newport Beach Country Club	Newport Beach	1973	Remodel after William Bell's original design in 1953.	PGA 2015
The Cove course at Indian Wells Country Club	Indian Wells	1995	Collaboration with Ted Robinson to create a second course added in 1995 (original course dated to 1956).	Desert Golf Magazine 2012

NRHP and CRHR Evaluation

Criteria A/1 (Events)

Developed in the early 1960s, Western Hills Country Club was relatively late in the trend of recreational development in the Chino Hills area. Research to date does not indicate that any significant events in national, state or local history have taken place on the property, nor is the property associated with any significant trends or patterns of national, state, regional, or local history. The property is not a significant example of a golf course in the context of golf courses across the state or nation. Therefore, the country club does not appear eligible for listing under NRHP Criterion A or CRHR Criterion 1.

Criteria B/2 (Individuals)

Research to date has not identified any significant people to be directly associated with the Western Hills Country Club. It is recommended not eligible under Criteria B/2.

Criteria C/3 (Design/Construction)

The Western Hills Country Club was developed in 1963 on the lands of a former cattle ranch. While a few of the ranch buildings were repurposed for the country club, the majority of the ranch's buildings and

features were removed and altered. Those former ranch buildings reused at the country club (the clubhouse and golf cart building) were later demolished in the 1980s. The extant clubhouse reflects a contemporary Spanish Revival style from its latest remodel in the 1980s, and other buildings such as the masonry restroom building and pool house building are utilitarian with no clearly discernible style. Research to date on Harry and David Rainville did not indicate that they are considered masters in the field of golf course architecture, and the golf course itself is not representative of a significant or distinctive golf course design. Consequently, the property does not appear eligible for listing under Criteria C/3.

Criteria D/4 (Information Potential)

The potential to yield information important to prehistory or history is typically applied to archaeological resources and is not applied to this evaluation of the Western Hills Country Club.

In summary, the Western Hills Country Club is not considered a historical resource pursuant to CEQA.

8.4 Impact Assessment and Mitigation Measure for RHNA Sites

8.4.1 *Significance Thresholds*

8.4.1.1 ARCHAEOLOGICAL RESOURCES

Under CEQA, archaeological resources may meet the definition of a historical resource or unique archaeological resource. Any project that may cause a substantial adverse change in the significance of a historical resource would also have a significant effect on the environment. Substantial adverse change to the significance of a historical resource is defined as physical demolition, destruction, alteration, or relocation of the resource or immediate surroundings such that its significance would be materially impaired. CEQA states that when a project would cause damage to a unique archaeological resource, reasonable efforts must be made to preserve the resource in place or leave it in an undisturbed state. General or specific measures are required to the extent that the resources could be damaged or destroyed by a proposed project.

8.4.1.2 BUILT ENVIRONMENT HISTORICAL RESOURCES

Under CEQA, any project that may cause a substantial adverse change in the significance of a historical resource would also have a significant effect on the environment. Substantial adverse change to the significance of a historical resource is defined as physical demolition, destruction, alteration, or relocation of the resource or immediate surroundings such that its significance would be materially impaired. CEQA states that when a project will cause damage to a historical resource, reasonable efforts must be made to mitigate, avoid, or otherwise lessen the impact, through the adoption of enforceable mitigation measures, and to consider feasible alternatives capable of achieving project objectives while avoiding significant adverse impacts. Under CEQA, projects that comply with the *Secretary of the Interior's Standards for the Treatments of Historic Properties* are typically considered to be projects that would not cause a significant adverse impact to historical resources. Under CEQA, archaeological resources may meet the definition of a historical resource or unique archaeological resource. Any project that may cause a substantial adverse change in the significance of a historical resource would also have a significant effect on the environment. Substantial adverse change to the significance of a historical resource is defined as physical demolition, destruction, alteration, or relocation of the resource or immediate surroundings such that its significance would be materially impaired. CEQA states that when a project would cause damage

to a historical resource or unique archaeological resource, reasonable efforts must be made to preserve the resource in place or leave it in an undisturbed state.

8.4.2 *Mitigation Measures*

The site-specific analysis concluded that no archaeological resources would be directly impacted by implementation of the development plans for the nine RHNA sites. Any ground disturbance, however, has the potential to expose and/or displace archaeological resources, constituting a potentially significant impact requiring the consideration of mitigation measures. Accordingly, the following avoidance or minimization recommendation is applicable to all nine RHNA sites.

Mitigation Measure RHNA-CUL-1. Requirements to Avoid Impacts to Cultural Resources

a. Prior to the issuance of a demolition permit, the project proponent will retain a qualified archaeologist, defined as an archaeologist who meets the Secretary of the Interior's Professional Qualifications Standards for historical archaeology, along with a Native American Monitor from a local culturally affiliated Tribe to carry out and ensure proper implementation of the regulatory compliance measures for archaeological resources.

b. Prior to the commencement of project activities, an archaeological resources monitoring plan (Monitoring Plan) will be prepared in compliance with PRC Section 5024.1, 14 CCR 15064.5 of the CEQA Guidelines, and PRC Sections 21083.2 and 21084.1. To satisfy these regulations, the Monitoring Plan will include, but not be limited to, monitoring protocol for ground-disturbing activities, a construction worker training program, and discovery and processing protocol for inadvertent discoveries of archaeological resources. The Monitoring Plan will identify the process for contacting Tribal groups in the event of inadvertent discovery of archaeological resources or human remains potentially affiliated with Native Americans.

c. Before the commencement of initial demolition or excavation at the project area, the retained qualified archaeologist or their designee will provide Worker Environmental Awareness Program training to on-site project personnel responsible for supervising demolition and excavation (i.e., foreman or supervisor) and machine operators.

d. The qualified archaeologist will be present during demolition and excavation activities, as to be stipulated in the Monitoring Plan. The qualified archaeologist will have the authority to temporarily halt or redirect construction activities in soils that are likely to contain archaeological resources. In the event that archaeological resources are exposed during construction, work in the immediate vicinity of the find (within 8 m [25 feet]) shall stop until the qualified archaeologist can evaluate the significance of the find. Construction activities may continue in other areas. If the discovery is determined by the qualified archaeologist to constitute a "historical resource" pursuant to CEQA Guidelines in 14 CCR 15064.5(a) or a "unique archaeological resource" pursuant to PRC Section 21083.2(g), the qualified archaeologist will coordinate with the project proponent and lead agency to develop a formal treatment plan that would reduce impacts to the resource(s). The treatment plan established for the resource(s) will be prepared in accordance with CEQA Guidelines in 14 CCR 15064.5(f) for historical resources and PRC Section 21083.2(b) for unique archaeological resources. At the conclusion of monitoring, a technical report will be prepared that summarizes the results and findings. The format and content of the report shall follow the California OHP's Archaeological Resource Management Reports (ARMR): Recommended Contents and Format (California OHP 1990). Any archaeological resources identified will be

documented on appropriate DPR 523 series forms. The final draft of the report will be submitted to the SCCIC.

With the implementation of the measures outlined in Mitigation Measure RHNA-CUL-1, impacts to archaeological resources at the nine RHNA sites analyzed at a site-specific level would be reduced to less than significant levels.

As stated previously, no historical resources would be directly impacted by implementation of the development plans for the nine RHNA sites examined at a site-specific level. Additionally, there are no other properties within the RHNA sites that would come of age during the Housing Element cycle. Those properties within the RHNA sites that are presently developed, but are not yet 45 years old, contain buildings and/or structures that were constructed between 1999 and 2014, therefore, will not come of age until 2044 at the earliest. Therefore, no significant adverse impacts to historical resources would result from project implementation and no further analysis is needed pursuant to CEQA for the RHNA sites.

9 REFERENCES CITED

Altschul, Jeffrey H., John G. Douglass, Richard Ciolek-Torrello, Sarah Van Galder, Benjamin R. Vargas, Kathleen L. Hull, Donn R. Grenda, Jeffrey Homburg, Manuel Palacios-Fest, Steven Shelley, Angela Keller, and David Maxwell
2007 Life at the Nexus of the Wetlands and Coastal Prairie, West Los Angeles. *Proceedings of the Society for California Archaeology* 20:34–42.

American Society of Golf Course Architects
2022 Architect's Gallery. Michigan State University. Available at: https://tic.msu.edu/tgif/limiting?interface=archg. Accessed July 2022.

Antique Golf Clubs from Scotland
2021 John Duncan Dunn. Available at: https://www.antiquegolfscotland.com/antiquegolf/maker.php3?makerid=666. Accessed July 2022.

Ashby, G. E., and J. W. Winterbourne
1966 A Study of Primitive Man in Orange County and Some of Its Coastal Areas. *Pacific Coast Archaeological Society Quarterly* 2(1):5–52.

Bancroft, Hubert Howe
1886 *History of California, Volume III: 1825-1840*. A. L. Bancroft, San Francisco.

Barrows, H.D.
1914 The Lugo Family of California. *Annual Publications, Historical Society of Southern California* IX(1912-1913-1914):34–40. Historical Society of Southern California, Los Angeles. Available at: https://www.google.com/books/edition/The_Historical_Society_of_Southern_Calif/Rsg1AAAAIAAJ?hl=en&gbpv=1. Accessed July 2022.

Bean, Lowell J., and Charles R. Smith
1978 Gabrielino. In *California,* edited by R. F. Heizer, pp. 538–549. Handbook of North American Indians, Vol. 8, W. C. Sturtevant, general editor. Smithsonian Institution Press, Washington, D.C.

Beattie, George William
1942 The Battle of Chino. *The Quarterly: Historical Society of Southern California* 24(4):143–160.

Belden, L. Burr
1960 Padre Founds City in 1810 and Gives Valley Its Name. *The Sun-Telegram* 20 May:S-2. Sand Bernadino, California. Available at: https://www.sbcity.org/about/history/sesquicentennial_1810-1960/s-2_san_bernardino_150_yrs. Accessed June 2022.

Blackburn, Thomas
1963 *Ethnohistoric Descriptions of Gabrielino Material Culture.* Annual Report, Archaeological Survey. University of California, Los Angeles.

Boys Republic
2022 Our History. Available at: https://boysrepublic.org/our-history/. Accessed July 2022.

Byrd, Brian F., and L. Mark Raab
2007 Prehistory of the Southern Bight: Models for a New Millennium. In *California Prehistory*, edited by T. L. Jones and K. A. Klar, pp. 215–228. AltaMira Press, New York.

California Missions Foundation
2022 The California Missions. Available at: https://californiamissionsfoundation.org/the-california-missions/. Accessed September 2022.

California Office of Historic Preservation (OHP)
1990 *Archaeological Resources Management Reports (ARMR): Recommended Contents and Formats*. Available at: http://ohp.parks.ca.gov/pages/1054/files/armr.pdf.

2022a California Historical Resources. Available at: https://ohp.parks.ca.gov/ListedResources/?view=county&criteria=36. Accessed July 2022.

2022b Built Environment Resources Directory. Available at: https://ohp.parks.ca.gov/?page_id=30338. Accessed July 2022.

California State Library
n.d Los Serranos C. Club, the club house # C-1. Photographic print. E.F. Mueller Postcard Collection. Available at: https://csl.primo.exlibrisgroup.com/discovery/fulldisplay?docid=alma990014157230205115&context=L&vid=01CSL_INST:CSL. Accessed July 2022.

California State Parks
2018 Chino Hills State Park. California State Parks, Sacramento, California. Available at: https://www.parks.ca.gov/pages/648/files/ChinoHillsFinalWebLayout2018.pdf. Accessed July 2022.

Cal Poly Pomona University Library
2021 Pomona Valley Historical Collection – Chino & Chino Hills. Available at: https://libguides.library.cpp.edu/c.php?g=771946&p=7979552. Accessed July 2022.

Carson, Mathew, Kristina Akesson, and Russell Shapiro
2022 *Paleontological Resources Technical Report for the Chino Hills General Plan Update, City of Chino Hills, California.* Prepared for EcoTierra Consulting, Inc. and the City of Chino Hills, Westlake Village, California. SWCA Environmental Consultants, Pasadena, California.

Chace, Paul G.
1969 Biological Archaeology of Some Coastal Middens, Orange County, California. *Pacific Coast Archaeological Society Quarterly* 5(2):65–75.

Chino Champion
1926a Los Serranos Club Sold to Syndicate of Members. 10 August. Available at: https://www.newspapers.com/paper/chino-champion/3677/. Accessed July 2022.

1926b Members Now Owners Los Serranos Country Club. 20 August. Available at: https://www.newspapers.com/paper/chino-champion/3677/. Accessed July 2022.

1926c Many Improvements at Los Serranos Country Club. 17 September. Available at: https://www.newspapers.com/paper/chino-champion/3677/. Accessed July 2022.

1927a Will Rebuilt Home. 12 April. Available at: https://www.newspapers.com/paper/chino-champion/3677/. Accessed July 2022.

1927b Plan to Improve at Los Serranos. 8 November. Available at: https://www.newspapers.com/paper/chino-champion/3677/. Accessed July 2022.

1937 Take Home in Club Tract. 21 May. Available at: https://www.newspapers.com/paper/chino-champion/3677/. Accessed July 2022.

1948a Retired Army Officer Purchases Rancho Don Lugo Golf Course. 23 April. Available at: https://www.newspapers.com/paper/chino-champion/3677/. Accessed July 2022.

1948b Los Angeles Engineer and Wife Buys Rancho Don Lugo Club. 25 June. Available at: https://www.newspapers.com/paper/chino-champion/3677/. Accessed July 2022.

1950 Formal Opening of Los Serranos Golf and Country Club This Saturday. 2 June. Available at: https://www.newspapers.com/paper/chino-champion/3677/. Accessed August 2022.

1953a Paul Greening Buys Club from Clara Bartlett. 11 June. Available at: https://www.newspapers.com/paper/chino-champion/3677/. Accessed July 2022.

1953b Los Serranos Notes. 6 August. Available at: https://www.newspapers.com/paper/chino-champion/3677/. Accessed July 2022.

1953c Three Sportsmen to Operate Course at Los Serranos. 22 October. Available at: https://www.newspapers.com/paper/chino-champion/3677/. Accessed July 2022.

1961 3 Die in Plane Crash Here. 29 June. Available at: https://www.newspapers.com/paper/chino-champion/3677/. Accessed July 2022.

1963a Golf Course. 10 January. Available at: https://www.newspapers.com/paper/chino-champion/3677/. Accessed July 2022.

1963b New Western Hills Golf Club at Carbon Canyon Summit is Opened. 21 March. Available at: https://www.newspapers.com/paper/chino-champion/3677/. Accessed July 2022.

1963c Chino Rancher in Fatal Plan Accident Leaves Large Estate. 3 October. Available at: https://www.newspapers.com/paper/chino-champion/3677/. Accessed July 2022.

1978 Fictitious Business Name Statement for Western Hills Mobile Home Estates. 24 March. Available at: https://www.newspapers.com/paper/chino-champion/3677/. Accessed July 2022.

1986 Fictitious Business Name Statement for Western Hills Country Club. 21 November. Available at: https://www.newspapers.com/paper/chino-champion/3677/. Accessed July 2022.

1988 Western Hills sprucing up. 5 February. Available at: https://www.newspapers.com/paper/chino-champion/3677/. Accessed July 2022.

Chino Hills Champion

1994 Country club redo. 25 August. Available at: https://www.newspapers.com/paper/chino-hills-champion/3679/. Accessed July 2022.

City of Chino Hills
1994-2016 Building permits for Los Serranos Golf Course. On file with the City of Chino Hills.

2015a *City of Chino Hills General Plan*. Adopted February 2015. City of Chino Hills, California. Available at: https://www.chinohills.org/124/General-Plan. Accessed July 2022.

2015b *City of Chino Hills Final Program Environmental Impact Report, General Plan Update*. City of Chino Hills, California. February 24.

2018 Letter to City Council regarding: Dedication of Fairway Drive. Regular Meeting Date August 14, 2018. Available at https://agendaquick.chinohills.org:8086/agenda_publish.cfm?id=&mt=ALL&get_month=3&get_year=2022&dsp=agm&seq=780&rev=0&ag=110&ln=4646&nseq=781&nrev=0&pseq=782&prev=0#ReturnTo4646. Accessed July 2022.

2022a Tres Hermanos Conservation Authority. Available at: https://www.chinohills.org/1341/Tres-Hermanos#:~:text=Tres%20Hermanos%20Ranch%20is%202%2C445,the%20City%20of%20Diamond%20Bar. Accessed August 2022.

2022b History. Available at: https://www.chinohills.org/95/History#:~:text=The%20natural%20beauty%20of%20Chino,located%20in%20an%20urban%20setting. Accessed July 2022.

2022c 2021–2029 Planning Period Housing Element. Adopted February 8, 2022. City of Chino Hills, California.

Cleland, James H., Andrew L. York, and Lorraine M. Willey
2007 *Piecing Together the Prehistory of Landing Hill: A Place Remembered.* EDAW Cultural Publications No. 3. EDAW, Inc., San Diego, California.

Cleland, Robert Glass
2005 *The Cattle on a Thousand Hills: Southern California, 1850-80.* 2nd ed. Huntington Library, San Marino, California.

Colton Daily Courier
1925 Los Serranos Country Club Opens Sunday. 22 April. Available at: https://www.newspapers.com/paper/colton-daily-courier/22545/. Accessed July 2022.

County of San Bernardino
2007 The Asistencia. Available at: http://www.sbcounty.gov/museum/calendar/branches/asist.htm. Accessed June 2022.

Curtis, Charles
1954 Covina, Los Serranos Courses Take Shape. *Los Angeles Times* 28 February. Available at: https://www.newspapers.com/paper/the-los-angeles-times/4312/. Accessed July 2022.

Dakin, Susanna Bryant
1978 *A Scotch Paisano in Old Los Angeles: Hugo Reid's Life in California, 1832-1852 Derived from His Correspondence*. Originally published 1939. University of California Press, Berkeley, Los Angeles, and London, United Kingdom.

Desert Golf Magazine
2012 "Time to Evaluate Your Real Estate Assets." Available at https://desertgolfer.com/wp-content/uploads/2022/05/DesertFeb-Mar2012web.pdf. Accessed August 2022.

Dibblee, Thomas W., Jr., and John A. Minch (editor)
2002 Geologic Map of the San Dimas and Ontario 7.5-Minute Quadrangles, Los Angeles and San Bernardino Counties, California. Santa Barbara Museum of Natural History. Available at: https://ngmdb.usgs.gov/mapview/?center=-117.743,33.941&zoom=12. Accessed July 2022.

2010 Geologic Map of the Yorba Linda & Prado Dam 7.5-Minute Quadrangles, Los Angeles, Orange, San Bernardino, and Riverside Counties, California. Santa Barbara Museum of Natural History. Available at: https://ngmdb.usgs.gov/mapview/?center=-117.743,33.941&zoom=12. Accessed July 2022.

Dillon, B.D.
2002 California Paleoindians: Lack of Evidence, or Evidence of Lack. In *Essays in California Archaeology: A Memorial to Franklin Fenenga*, edited by William James Wallace and Francis A. Riddell, pp.110–128. Contributions of the University of California Archaeological Research Facility No. 60. University of California, Berkeley.

Douglass, John G., Richard Ciolek-Torrello, Jeffrey H. Altschul, and Donn R. Grenda
2016 *People in a Changing Land: The Archaeology and History of the Ballona in Los Angeles, California.* Vol. 5, edited by J. A. Homburg, J. G. Douglass, and S. N. Reddy. Technical Series 94. Statistical Research, Inc., Redlands, California.

Drover, Christopher E.
1971 Three Fired-Clay Figurines from 4-Ora-64, Orange County, California. *Pacific Coast Archaeological Society Quarterly* 7(4):73–86.

1975 Early Ceramics from Southern California. *Journal of California Anthropology* 2(1):101–107.

Drover, Christopher E., Henry C. Koerper, and Paul E. Langenwalter II
1983 Early Holocene Adaptation on the Southern California Coast: A Summary Report of Investigations at the Irvine Site (CA-ORA-64), Newport Bay, Orange County, California. *Pacific Coast Archaeological Society Quarterly* 19(2, 3):1–84.

Dun & Bradstreet
2022 "West Hills Golf Associates." Available at https://www.dandb.com/businessdirectory/westhillsgolfassociates-chinohills-ca-19363093.html. Accessed August 2022.

Erlandson, Jon M.
1991 Early Maritime Adaptations on the Northern Channel Islands. In *Hunter-Gatherers of Early Holocene Coastal California*, edited by J. M. Erlandson and R. Colten, pp. 101–112. Perspectives in California Archaeology, Vol. 1. Institute of Archaeology, University of California, Los Angeles.

Glassow, Michael A.
1997 Middle Holocene Cultural Development in the Central Santa Barbara Channel Region. In *Archaeology of the California Coast during the Middle Holocene*, edited by J. M. Erlandson and M. A. Glassow, pp.73–90. Perspectives in California Archaeology, Vol. 4. Institute of Archaeology, University of California, Los Angeles.

Glassow, Michael A., L. Wilcoxon, and J. M. Erlandson
1988 Cultural and Environmental Change During the Early Period of Santa Barbara Channel Prehistory. In *The Archaeology of Prehistoric Coastlines*, edited by G. Bailey and J. Parkington, pp. 64–77. Cambridge University Press, Cambridge, United Kingdom.

Glenn Lukos Associates
2010 *Results of Biological Overview for the City of Chino Hills, San Bernardino County, California*. Glenn Lukos Associates.

Goldstein, Richard
2009 Jack Kramer, 88, Champion, Promoter and Powerful Force in Tennis, Is Dead. *Los Angeles Times* 13 September. Available at: https://www.nytimes.com/2009/09/14/sports/tennis/14kramer.html#:~:text=Jack%20Kramer%2C%20the%20Wimbledon%20and,cancer%2C%20his%20son%20Robert%20said. Accessed July 2022.

Golf
2020 Designers with the most credits in our Top 100 Courses in the U.S. ranking. November 3, 2020. Available at: https://golf.com/travel/top-100-courses-us-architect/. Accessed July 2022.

Golf Club Atlas
2004–2016 Discussion Thread: John Duncan Dunn. Available at: https://www.golfclubatlas.com/forum/index.php/topic,13078.0/nowap.html?PHPSESSID=8f5abb0089ba4ae0682f03514bb13532. Accessed July 2022.

Golf Course Ranking
2022 Harry Rainville. Available at: https://www.golfcourseranking.com/architect-profile/list-of-courses-designed/harry-rainville/271/www.golfcourseranking.com. Accessed August 2022.

Golf Digest
2013 America's 100 Greatest Golf Courses: By Architect. Available at: https://www.golfdigest.com/gallery/top-100-golf-courses-by-architect. Accessed July 2022.

Golf Link
2022a Western Hills Country Club. Available at: https://www.golflink.com/golf-courses/ca/chino-hills/western-hills-golf-country-club. Accessed August 2022.

2022b San Diego Country Club, Chula Vista, California. Available at: https://www.golflink.com/golf-courses/ca/chula-vista/san-diego-country-club. Accessed August 2022.

GolfPass
2022a John Duncan Dunn. Available at: https://www.golfpass.com/travel-advisor/architects/1820-john-duncan-dunn/. Accessed August 2022.

2022b Harry Rainville. Available at: https://www.golfpass.com/travel-advisor/architects/1388-harry-rainville/. Accessed August 2022.

Golfweek
2021 Golfweek's Best 2021: The top architects on the Modern, Classic Courses lists. Available at: https://golfweek.usatoday.com/lists/golf-courses-golfweeks-best-2021-top-architects/. Accessed July 2022.

Google Earth
2022 Aerial imagery of Chino Hills, California and vicinity. Google Earth.

Grenda, Donn R.
1997 *Continuity and Change: 8,500 Years of Lacustrine Adaptation on the Shores of Lake Elsinore*. Statistical Research Technical Series No. 59. Statistical Research, Inc., Tucson, Arizona.

Gust, Sherri, and Molly Valasik
2011 *Paleontological and Cultural Resources of Chino Hills for the General Plan Update, City of Chino Hills, California*. Prepared for Comprehensive Planning Services. Cogstone.

Harrington, John P.
1942 *Culture Element Distributions: XIX, Central California Coast*. Anthropological Records Vol. 7, No. 1. University of California Press, Berkeley.

Heizer, Robert F.
1968 *Village Names in Twelve California Mission Records.* Reports of the University of California Archaeological Survey No. 74. University of California Archaeological Survey.

Hills for Everyone
2022 Achievements. Available at: https://www.hillsforeveryone.org/about-us/achievements/. Accessed July 2022.

Hoover, Mildred Brooke, Hero Eugene Rensch, Ethel Grace Rensch, and William N. Abeloe
2002 *Historic Spots in California*. Stanford University Press, Stanford, California.

Hudson, Dee Travis
1969 The Archaeological Investigations during 1935 and 1937 at ORA-237 and ORA-239, Santiago Canyon, Orange County, California. *Pacific Coast Archaeological Society Quarterly* 5(1):1–68.

1971 Proto-Gabrielino Patterns of Territorial Organization in South Coastal California. *Pacific Coast Archaeology Society Quarterly* 7(2):49–76.

Huntington Library
2022 Map of subdivision of part of Rancho Santa Ana del Chino, San Bernardino Co., California / surveyed by H.B. Martin. Available at https://hdl.huntington.org/digital/collection/p15150coll4/id/5206/rec/1. Accessed July 2022.

Johnson, J. R., T. W. Stafford, Jr., H. O. Ajie, and D. P. Morris
2002 Arlington Springs Revisited. In *Proceedings of the Fifth California Islands Symposium*, edited by D. R. Brown, K. C. Mitchell, and H. W. Chaney, pp. 541–545. Santa Barbara Museum of Natural History, Santa Barbara, California.

Johnston, Bernice E.
1962 *California's Gabrielino Indians.* Frederick Webb Hodge Anniversary Publication Fund 8. Southwest Museum, Los Angeles, California.

Jones, Terry L., Richard T. Fitzgerald, Douglas J. Kennett, Charles Miksicek, John L. Fagan, John Sharp, and Jon M. Erlandson
2002 The Cross Creek Site and Its Implications for New World Colonization. *American Antiquity* 67:213–230.

King, Chester D.
1994 *Native American Placenames in the Santa Monica Mountains National Recreation Area, Agoura Hills*. Topanga Anthropological Consultants, California.

Kirkman, George W.
1937 Kirkman-Harriman Pictorial and Historical Map of Los Angeles County 1860-1937. Call Number 91.7941 L88Ki. Los Angeles Public Library Online Map Collection. Los Angeles Public Library, Los Angeles, California.

Koerper, Henry C., and Christopher E. Drover
1983 Chronology Building for Coastal Orange County: The Case from CA-ORA-119-A. *Pacific Coast Archaeological Society Quarterly* 19(2):1–34.

Koerper, Henry C., Roger D. Mason, and Mark L. Peterson
2002 Complexity, Demography, and Change in Late Holocene Orange County. In *Catalysts to Complexity, Late Holocene Societies of the California Coast*, edited by J. M. Erlandson and T. L. Jones, pp. 63–81. Perspectives in California Archaeology Vol. 6. Costen Institute of Archaeology, University of California, Los Angeles.

Kowta, M.
1969 The Sayles Complex, A Late Milling Stone Assemblage from the Cajon Pass and the Ecological Implications of its Scraper Planes. *University of California Publications in Anthropology* 6:35–69. Berkeley, California.

Kroeber, Alfred L.
1925 *Handbook of the Indians of California*. Bureau of American Ethnology Bulletin 78. Dover Publications, Inc. New York. Originally published 1925, Smithsonian Printing Office, Washington, D.C.

Langenwalter, Paul E., II, and James Brock
1985 *Phase II Archaeological Studies of the Prado Basin and the Lower Santa Ana River.* On file, U.S. Army Corps of Engineers, Los Angeles District.

Lee, Jessica C.
2006 Escaping to a hideaway in a hollow. 16 April. *Los Angeles Times*. Available at: https://www.latimes.com/archives/la-xpm-2006-apr-16-re-guide16-story.html. Accessed July 2022.

Legacy
2020 Jacob Y. Terner, M.D. Obituary. Available at https://www.legacy.com/us/obituaries/latimes/name/jacob-terner-obituary?id=9223507. Accessed August 2022.

Long Beach Press-Telegram

1924a Davison and Associates Buy 750 Acres Near Chino for Country Club Project. 13 January. Available at: https://www.newspapers.com/paper/press-telegram/26586/. Accessed July 2022.

1924b Big Country Club to Use Ground of Chino Home Ranch. 10 February. Available at: https://www.newspapers.com/paper/press-telegram/26586/. Accessed July 2022.

1924c Famous Rancho Landmark Now a Country Club. 17 February. Available at: https://www.newspapers.com/paper/press-telegram/26586/. Accessed July 2022.

1924d Recall History of Early California in Visit to Chino. 11 May. Available at: https://www.newspapers.com/paper/press-telegram/26586/. Accessed July 2022.

Los Angeles Times

1953a Rancher Buys Los Serranos Golf Course. 18 June. Available at: https://www.newspapers.com/paper/the-los-angeles-times/4312/. Accessed July 2022.

1953b Kramer Among Group Operating Chino Golf Links. 17 October. Available at: https://www.newspapers.com/paper/the-los-angeles-times/4312/. Accessed July 2022.

Los Serranos Golf Club

2018a North course. Available at: https://losserranosgolfclub.com/north-course/. Accessed July 2022.

2018b South course. Available at: https://losserranosgolfclub.com/south-course/. Accessed July 2022.

2021 History of Los Serranos. Available at: https://losserranoscountryclub.com/history-of-los-serranos/. Accessed July 2022.

McCawley, William

1996 *The First Angelinos: The Gabrielino Indians of Los Angeles*. Malki-Ballena Press, Banning, California

Mckinnon, Malcolm

n.d. The Dunn Family and their influence on Golf Club Architecture and Golf in America. Springdale Golf Club, Princeton, New Jersey. Available at: https://www.springdalegc.org/Files/Library/DUNNFAMILYII.PDF. Accessed July 2022.

Macko, Michael E.

1998 *The Muddy Canyon Archaeological Project: Results of Phase II Test Excavations and Phase III Data Recovery Excavations at Archaeological Sites within the Crystal Cove Planned Community, Phase IV, Tentative Tract 15447, San Joaquin Hills, Orange County, California*. On file, South Central Coastal Information Center, California State University, Fullerton.

Mason, Roger D., and Mark L. Peterson

1994 *Newport Coast Archaeological Project: Newport Coast Settlement Systems–Analysis and Discussion,* Vol. 1, Part 1 of 2. Keith Companies. Costa Mesa, California.

Meighan, Clement W.
1954 A Late Complex in Southern California Prehistory. *Southwestern Journal of Anthropology* 10(2):215–227.

Merriam, Clinton Hart
1955 *Studies of California Indians*. University of California Press, Berkeley.

Miranda, Michael
2022 LSGC Tournament Director. Personal communication with Susan Zamudio-Gurrola, July 5, 2022.

Mission San Gabriel Arcángel
2022 History. Available at: https://parish.sangabrielmissionchurch.org/apps/pages/index.jsp?uREC_ID=170484&type=d&pREC_ID=1809386. Accessed June 2022.

Moratto, M. J.
1984 *California Archaeology*. Academic Press, New York.

Moriarty, J.R., III
1966 Cultural Phase Divisions Suggested by Typological Change Coordinated with Stratigraphically Controlled Radiocarbon Dating in San Diego. *The Anthropological Journal of Canada* 4(4):20–30.

Napoles, Marianne
2018 Houses pondered for Los Serranos Golf Course. 15 December. Champion Newspapers. Available at: https://www.championnewspapers.com/news/article_af5ea642-ffdd-11e8-86b1-93a275bfc1bf.html. Accessed July 2022.

National Park Service
1995 *How to Apply the National Register Criteria for Evaluation*. National Register Bulletin 15. U.S. Department of the Interior, National Park Service, Cultural Resources.

NETRonline
1938–2020 Aerial imagery depicting Chino Hills, California. Available at: https://historicaerials.com/. Accessed July 2022.

Perez, Cris
1982 *Grants of Land in California Made by Spanish or Mexican Authorities*. Prepared by the Staff of the State Lands Commission. Available at: https://www.slc.ca.gov/wp-content/uploads/2018/11/1982-GrantsSpanishMexican.pdf. Accessed September 2022.

PGA Tour
2015 Champions Tour, 2015 Official Guide. Available at https://pgatourmedia.pgatourhq.com/static-assets/page/header/files/2015_champions.pdf. Accessed July 2022.

Pomona Progress Bulletin
1953 Los Serranos Golf Club Property Sale Reported. 8 June. Available at: https://www.newspapers.com/paper/the-pomona-progress-bulletin/22484/. Accessed July 2022.

1954 Nine Holes Will Open Soon at Los Serranos. 4 February. Available at: https://www.newspapers.com/paper/the-pomona-progress-bulletin/22484/. Accessed July 2022.

Rogers, Malcom J.
1939 Early Lithic Industries of the Lower Basin of the Colorado River and Adjacent Desert Areas. San Diego Museum of Man Papers 3. San Diego Museum of Man, San Diego, California.

1945 An Outline of Yuman Prehistory. *Southwestern Journal of Anthropology* 1(2):167–198.

San Bernardino County Assessor-Recorder-Clerk
2022 Parcel data for San Bernardino County parcel numbers 1031011400000 and 1000051280000.

San Bernardino County Sun
1953 Los Serranos Country Club Sold, Golf Course to Be Closed Down. 12 June. Available at: https://www.newspapers.com/paper/the-san-bernardino-county-sun/1686/. Accessed July 2022.

San Bernardino Daily Sun
1925 Los Serranos Country Club Has Ideal Site for Sports; Old Hospitality Recalled. 21 April. Available at: Newspapers.com. Accessed July 2022.

Sawyer, William A., and James Brock
1999 *Archaeology of Foothill Ranch, El Toro, California*. On file, South Central Coastal Information Center, California State University, Fullerton.

Sawyer, William A., and Henry C. Koerper
2006 The San Joaquin Hills Venus: A Ceramic Figurine from CA-ORA-1405-B. In *Contributions from Orange County Presented in Remembrance of John Peabody Harrington*, edited by H. C. Koerper, pp. 13–34. Coyote Press Archives of California Prehistory No. 53. Coyote Press, Salinas, California.

Sperlings BestPlaces
2022 Climate in Chino Hills, California. Available at: https://www.bestplaces.net/climate/city/california/chino_hills. Accessed July 2022.

Spitzzeri, Paul
2014 Oil Drilling in Carbon Canyon's Chino Hills Portion, Part Two. Carbon Canyon Chronicle, 29 July. Available at: http://carboncanyonchronicle.blogspot.com/2014/07/oil-drilling-in-carbon-canyons-chino_29.html. Accessed July 2022.

2018a Isaac Williams and the Rancho Santa Ana del Chino. Champion Newspapers, 24 March. Available at: https://www.championnewspapers.com/opinion_and_commentary/history_of_the_hills/article_bf925ce6-2eb6-11e8-a0ae-47c7ed4ae2b0.html?mode=jqm. Accessed July 2022.

2018b A Visit to Rancho Santa Ana del Chino, December 1849. Champion Newspapers, 21 July. Available at: https://www.championnewspapers.com/opinion_and_commentary/history_of_the_hills/article_86f7ab3a-8c43-11e8-9285-672ec5aafce0.html. Accessed July 2022.

2018c Jose del Carmen Lugo and the Battle of Chino. Champion Newspapers, 28 April. Available at: https://www.championnewspapers.com/opinion_and_commentary/history_of_the_hills/article_69be3462-4a3a-11e8-a396-9f4b6b617ae4.html. Accessed July 2022.

2018d The Chino Ranch and Joseph Bridger, 1865-1881. Champion Newspapers, 10 November. Available at: https://www.championnewspapers.com/opinion_and_commentary/history_of_the_hills/article_97f82e64-e436-11e8-bed4-7f27e4c2eed5.html. Accessed July 2022.

2019a Boom to Bust at Chino Ranch. Champion Newspapers, 5 January. Available at: https://www.championnewspapers.com/opinion_and_commentary/history_of_the_hills/article_5eeca1f6-103a-11e9-9564-63ad14501082.html. Accessed July 2022.

2019b Chino Land and Water Company. Champion Newspapers, 13 April. Available at: https://www.championnewspapers.com/opinion_and_commentary/history_of_the_hills/article_63ea7d14-5d46-11e9-ac3b-2397f9b95c95.html. Accessed July 2022.

2020a Take Me Home, Country Roads: A History of Carbon Canyon Road, 1910-1930. February 4, 2020. The Homestead Blog, Workman & Temple Family Homestead Museum. Available at: https://homesteadmuseum.blog/2020/02/04/take-me-home-country-roads-a-history-of-carbon-canyon-road-1910-1930/. Accessed July 2022.

2020b The Founding of Los Serranos Country Club, 1924-1925. Champion Newspapers, 11 July. Accessed July 2022. https://www.championnewspapers.com/opinion_and_commentary/history_of_the_hills/article_5fdf692c-c2bd-11ea-9528-5f94d5845e3e.html

2021 Los Serranos Country Club as an African-American haven, 1949. Champion Newspapers, 23 October. Available at: https://www.championnewspapers.com/opinion_and_commentary/history_of_the_hills/article_da1e0162-3350-11ec-b8c5-1f3b31a8467b.html. Accessed July 2022.

Sutton, Mark Q.

1993 On the Subsistence Ecology of the "Late Inland Millingstone Horizon" in Southern California. *Journal of California and Great Basin Anthropology* 15(1):134–140.

Tang, B., M. Hogan and C. Tibbett

2004 Historical Resources Evaluation of the Los Serranos Neighborhood, Chino Hills, San Bernardino County, California. In Gust, Sherri and Molly Valasik. 2011. *Paleontological and Cultural Resources of Chino Hills for the General Plan Update, City of Chino Hills, California*. Prepared for Comprehensive Planning Services. Cogstone.

Top 100 Golf Courses

2019 Top 100 Golf Course Architects. Available at: https://www.top100golfcourses.com/news-item/top-100-golf-course-architects. Accessed July 2022.

True, Delbert L.

1958 An Early Complex in San Diego County, California. *American Antiquity* 23(3): 255–263.

1993 Bedrock Milling Elements as Indicators of Subsistence and Settlement Patterns in Northern San Diego County, California. *Pacific Coast Archaeological Society Quarterly* 29(2):1–26.

University of California, Santa Barbara (UCSB) Library
1928a Aerial photograph. Flight C-300, Frame I-325. Available at https://mil.library.ucsb.edu/ap_indexes/FrameFinder/. Accessed July 2022.

1928b Aerial photograph. Flight C-300, Frame I-267. Available at https://mil.library.ucsb.edu/ap_indexes/FrameFinder/. Accessed July 2022.

1935 Aerial photograph. Flight C-3668, Frame 50. Available at: https://mil.library.ucsb.edu/ap_indexes/FrameFinder/. Accessed July 2022.

1937 Aerial photograph. Flight C-4542, Frame 44. Available at: https://mil.library.ucsb.edu/ap_indexes/FrameFinder/. Accessed July 2022.

1946 Aerial photograph. Flight GS-CP, Frame 8-86. Available at: https://mil.library.ucsb.edu/ap_indexes/FrameFinder/. Accessed July 2022.

U.S. Census Bureau
2022 QuickFacts, Chino Hills city, California. Available at: https://www.census.gov/quickfacts/chinohillscitycalifornia. Accessed July 2022.

Wallace, W. J.
1955 A Suggested Chronology for Southern California Coastal Archaeology. *Southwestern Journal of Anthropology* 11(3):214–230.

1978 Post-Pleistocene Archaeology, 9000 to 2000 B.C. In *California*, edited by R. F. Heizer, pp. 25–36. Handbook of North American Indians Vol. 8, William G. Sturtevant, general editor. Smithsonian Institution, Washington, D.C.

Warren, Claude N.
1968 Cultural Tradition and Ecological Adaptation on the Southern California Coast. In *Archaic Prehistory in the Western United States*, edited by C. Irwin-Williams, pp. 1–14. Eastern New Mexico University Contributions in Anthropology Vol. 1, No. 3. Eastern New Mexico University, Portales.

Warren, Claude N., and D. L. True
1984 The Desert Region. In *California Archaeology*, by Michael J. Moratto, with contributions by D.A. Fredrickson, C. Raven, and C. N. Warren, pp. 339-430. Academic Press, Orlando, Florida.

Watson, Ryan
2021 The Most Influential Course Architects. Golf Link. Available at: https://www.golflink.com/about_35530_most-influential-course-architects.html. Accessed July 2022.

Youngman, Randy
2020 California's Longest Holes and Courses. California Golf & Travel, April. Available at: https://issuu.com/calgolfnews/docs/cagolf_travel_april2020/s/10450537. Accessed July 2022.

APPENDIX A

California Historical Resources Information System Records Search Results

CONFIDENTIAL – NOT FOR PUBLIC RELEASE

Table A-1. Previous Cultural Resource Studies within the Study Area

SCCIC Report Number	Title of Study	Author and Affiliation	Year	Type	Location
SB-00186	Archeologic Values: Carbon Canyon Tracking Station	San Bernardino County Museum Association / San Bernardino County Museum Association	1973	Reconnaissance	Overall study area
SB-00208	Environmental Impact Analysis: (Archaeological Values), Western Hills Mobile Home Estates	San Bernardino County Museum Association / San Bernardino County Museum Association	1974	Reconnaissance	Overall study area
SB-00230	Archaeological Impact Report: Preliminary Report, Surface Survey, Saint Joseph's Hill of Hope	San Bernardino County Museum Association / San Bernardino County Museum Association	1974	Reconnaissance	Overall study area
SB-00246	Archaeological Portion of Environmental Impact Report for Carbon Canyon Specific Plan	San Bernardino County Museum Association / San Bernardino County Museum Association	1975	Reconnaissance	Overall study area
SB-00301*	**Archaeological - Historical Resources Assessment, Tentative Tracts 9282 – 9284**	**Harris, Ruth D. / San Bernardino County Museum Association**	**1976**	**Reconnaissance**	**The Shoppes**
SB-00416	Archaeological - Historical Resources Assessment of Existing Reservoir Site at The Northeast End of Hillside Road and The Existing Water Main at Oakway Lane in The Chino Area	Hearn, Joseph E. / San Bernardino County Museum Association	1976	Reconnaissance	Overall study area
SB-00430	Archaeological - Historical Resources Assessment of Sec. 31, T2S R8W, Chino Area	Hearn, Joseph E. / San Bernardino County Museum Association	1976	Reconnaissance	Overall study area
SB-00484	Environmental Impact Report: Palaeontologic Resources, Tentative Tract 9620, Carbon Canyon, Chino Hills, California	San Bernardino County Museum Association / San Bernardino County Museum Association	1977	Reconnaissance	Overall study area
SB-00505	Archaeological - Historical Resources Assessment of Sec. 17, T2S R8W, Chino Hills	Hearn, Joseph E. / San Bernardino County Museum Association	1977	Reconnaissance	Overall study area
SB-00616	Archaeological - Historical Assessment of Tentative Tract 10313, Chino Area	Hearn, Joseph E. / San Bernardino County Museum Association	1978	Reconnaissance	Overall study area

SCCIC Report Number	Title of Study	Author and Affiliation	Year	Type	Location
SB-00627	Archaeological - Historical Resources Assessment, Tentative Tract 10379, Chino	Hearn, Joseph E. / San Bernardino County Museum Association	1978	Reconnaissance	Overall study area
SB-00943	Environmental Impact Report on The Proposed General Plan Amendments for The Rolling Ridge Estates, County of San Bernardino	Tadlock, Jean and W. Lewis / Leighton and Associates	1978	Reconnaissance	Overall study area
SB-00945	Archaeological Survey Report: Drainage Improvement	Hammond, Stephen R.	1980	Field Survey	Overall study area
SB-00954	Paleontological, Archaeological, And Historical Resources, Chino Hills, County of San Bernardino, California	Mabry, Theo N. And Ronald D. Douglas (Editors) / Archaeological Planning Collaborative	1980	Field Survey	Overall study area
SB-00992	Archaeological Survey Report: The 2,575-Acre Tres Hermanos Ranch in San Bernardino and Los Angeles Counties, California	Van Horn, David M. / Archaeological Associates	1980	Field Survey	Overall study area
SB-01451	Inventory of Features, Cultural Resources, Chino Hills State Park	McGuire, Pamela J. And Nancy Evans / Resource Protection Division	1984	Reconnaissance	Overall study area
SB-01612	Cultural Resources Assessment of The Laband Ranch, Chino Hills, San Bernardino County, California	Brock, James and Richard J. Wall / Archaeological Advisory Group	1986	Reconnaissance	Overall study area
SB-01760	Test Excavations at CA-SBR-5694, Laband Ranch, Chino Hills, San Bernardino County, California	Brock, James / Archaeological Advisory Group	1988	Site Testing	Overall study area
SB-01863	An Intensive Archaeological Survey of The Chino Hills Residential Project Area, Near Sleepy Hollow, San Bernardino County, California	Mckenna, Jeanette A. And Roger G. Hatheway / Hatheway & Mckenna	1989	Reconnaissance	Overall study area
SB-01888	A Cultural Resources Investigation of The Valley Springs Equestrian Estates Property, Carbon Canyon, San Bernardino County, California	Mckenna, Jeanette A. / Hatheway & Mckenna	1989	Reconnaissance	Overall study area
SB-01900	A Cultural Resources Assessment of The Trout Ranch, Chino Hills, San Bernardino County, California	Brock, James and John F. Elliott / Archaeological Advisory Group	1989	Reconnaissance	Overall study area

SCCIC Report Number	Title of Study	Author and Affiliation	Year	Type	Location
SB-01931	Interim Statement on Potential Significance of CA-SBR-5694, Laband Ranch, Chino Hills, San Bernardino County, California	Brock, James / Archaeological Advisory Group	1987	Site Testing	Overall study area
SB-02059	Compendium Of Results of Obsidian Studies for Study Area Sites: Appendix to Prehistoric Sites in The Prado Basin, California: Regional Context and Significance Evaluation	Infotec Research / Infotec	1990	Site Testing	Overall study area
SB-02076	Cultural Resources Survey Report: The Harvest-Greening Property, San Bernardino County, California	Mason, Roger D. And Roger G. Hatheway / Keith Companies	1990	Reconnaissance	Overall study area
SB-02111	Supplemental Archival Study for Tract 14161, Chino Hills, San Bernardino County, California	Elliott, John F. And James Brock / Archaeological Advisory Group	1990	Field Survey	Overall study area
SB-02246	Results Of a Test Program Conducted at Archaeological Site Sbr-5096, San Bernardino County, California	Mason, Roger D. / Keith Companies	1990	Site Testing	Overall study area
SB-02892	Draft EIR for Carbon Creek Ranch and Tt9781 County of San Bernardino	Drover, Christopher / Environmental Impact Profiles	1977	Field Survey	Overall study area
SB-03012	Cultural Resources Survey and Impact Assessment for The Cajon/EPTC Pipeline Project Located in Portions of Los Angeles, San Bernardino, And Orange Counties, CA	Owen, Shelley Marie / EIP Associates	1995	Field Survey	Overall study area
SB-03073	Cultural Resources & Restraints, General Plan Considerations for The City of Chino, Sphere of Influence, Subarea 1, San Bernardino County, CA	Chace, Paul G. / The Keith Companies	1995	Field Survey	Overall study area
SB-03233	Cultural Resources Inventory Testing & Evaluation for The Proposed Edison Pipeline & Terminal Company (EPTC), Tonner Canyon Pipeline Modification Project, San Bernardino County, CA	Mckenna, Jeanette A. And Shelley M. Owen / EIP Associates	1996	Site Testing	Overall study area
SB-03563	Cultural Resource Assessment for PBMS Facility Cm 421-02, County of San Bernardino, CA	Lapin, Phillipe / LSA	2000	Reconnaissance	Overall study area
SB-03569	Cultural Resource Assessment for PBMS Facility La 473-02, City of Chino Hills, County of San Bernardino, CA	Lapin, Phillipe / LSA	2000	Field Survey	Overall study area

SCCIC Report Number	Title of Study	Author and Affiliation	Year	Type	Location
SB-03680	Cultural Resource Survey of the 161 Acre Fairfield Ranch & Results of Archaeological Testing at CA-SBR-4212 and CA-SBR-5245, Chino Hills, San Bernardino County, CA	Strudwick, Ivan / LSA	1999	Monitoring	Overall study area
SB-03681	Archaeological Monitoring Report: Missions at Chino Hills Project	Love, Bruce, Harry Quinn, And Miriam Dahdul / CRM Tech	2002	Field Survey	Overall study area
SB-03682	Archaeological Test Excavation of Site CA-SBR-5097 for the Proposed Leach Field Expansion, Chino Hills State Park	Carver,Larryn / Cal Parks	2002	Site Testing	Overall study area
SB-03683	Excavation Of a Small Archaeological Deposit & Monitoring of Grading on The Higgans Ranch Property for Polygon Communities, Inc, Chino Hills, CA	Maxon, Patrick O. / RMW Paleo	1998	Field Survey	Overall study area
SB-03684	Cultural Resource Assessment: Cingular Wireless Facility #Sb107-01, San Bernardino County, CA	Duke, Curt / LSA	2001	Reconnaissance	Overall study area
SB-03685	Archaeological Test Excavations of a Prehistoric Cultural Deposit at Butterfield Ranch, Tract 14425, Chino Hills, San Bernardino County, CA	Maxon, Patrick O. / RMW Paleo	1997	Field Survey	Overall study area
SB-03691	Final Test Investigation Report for CA-SBR-5096, Caltrans Project Title: Highway 71 Improvement Project	De Barros, Philip / Chambers Group, Inc	1992	Field Survey	Overall study area
SB-03692	Cultural Resource Survey for The Proposed Inland Empire Utilities Agency Water Treatment Plant-Regional Plant #5	Slawson, Dana N. / Albert A. Webb Associates	1998	Field Survey	Overall study area
SB-03693	Supplemental Historic Property Survey Report for Proposed Improvements to SR 71 Between I-10 & SR 91-CA-SBR-4212	Hammond, Stephen R. / Caltrans	1987	Site Testing	Overall study area
SB-03694	Historic Property Survey Report for Proposed Improvements to Sr 71 Between I-10 & SR 91-07/08 La, SBD, Riv-71-Various	Hammond, Stephen R. / Caltrans	1986	Field Survey	Overall study area
SB-03960	A Cultural Resource Assessment for Sb-040, Cox Cellular, 2050 Carbon Canyon, Chino Hills, CA	Drover, Christopher E. / Keith Companies	1998	Reconnaissance	Overall study area

SCCIC Report Number	Title of Study	Author and Affiliation	Year	Type	Location
SB-04385	Cultural Resources Survey of The Proposed Vila Borba Development Property, City of Chino Hills, San Bernardino County, CA	Paige, Peter F. / SWCA	2004	Field Survey	Overall study area
SB-04388	Historic Resources Evaluation of The Los Serranos Neighborhood, City of Chino Hills, San Bernardino County, CA	Tibbet, Casey / CRM Tech	2004	Field Survey	Overall study area
SB-04390	Cultural Resource Assessment for Cingular Wireless Facility Sb 189-02, City of Chino Hills, San Bernardino County, CA	Kyle, Carolyn / Kyle Consulting	2002	Reconnaissance	Overall study area
SB-04391	Archaeological Monitoring for The Crestwood Corporation Project on Eucalyptus Ave Between Maplewood and Chino Hills Parkway, San Bernardino County, CA	Maxon, Patrick / RMW Paleo	2001	Monitoring	Overall study area
SB-04393	Cultural Resource Assessment & Monitoring of Grading for The Chino Hills (Tt 14551-1) Proposed Development, Chino Hills, San Bernardino County, CA	Sikes, Nancy / SWCA	2003	Field Survey	Overall study area
SB-04395	Results of Archaeological Monitoring on the Fairfield Ranch Project Area, Chino Hills, San Bernardino County, CA	LSA Associates, Inc / LSA	2002	Field Survey	Overall study area
SB-04397	Record Search Results for Cingular Wireless Site Sb-191-01 (Village Oaks Reservoir Site) Located At 15527 Live Oak Rd, Chino Hills, San Bernardino County, CA	Bonner, Wayne / Alaris Group	2002	Reconnaissance	Overall study area
SB-04400	Cultural Resource Assessment for Cingular Wireless Facility Cm 329-05, City of Chino Hills, San Bernardino County, CA	Kyle, Carolyn / Kyle Consulting	2002	Reconnaissance	Overall study area
SB-04403	Archaeological Monitoring Report: Cingular Wireless Facility No. Cm 329-05, Chino Hills, San Bernardino County, CA	Duke, Curt / LSA	2003	Field Survey	Overall study area
SB-04409	Field Survey & Records Check of Tentative Tracts 8998 & 8999	Cottrell, Marie G. / Archaeological Research, Inc	1975	Reconnaissance	Overall study area

SCCIC Report Number	Title of Study	Author and Affiliation	Year	Type	Location
SB-04515	Cultural Resource Assessment: Cingular Wireless Facility No. Sb 288-04, Chino Hills, San Bernardino County, CA	Harper, Caprice D. / LSA	2004	Reconnaissance	Overall study area
SB-04516	CA-8515 (Western Hills)	Mckenna, Jeanette A. / Mckenna Et al	2004	Reconnaissance	Overall study area
SB-04517	Cellular Communications Tower Site-Grand 1, 1301 Grand Ave, Chino Hills, CA	O'Connell, Keith / URS	2004	Reconnaissance	Overall study area
SB-04518	Verizon Site: Peyton	Budinger, Fred E. / Tetra Tech, Inc	2002	Reconnaissance	Overall study area
SB-04533	Historic Resources Report: Ca8820B/Juniper, 11650 Sierra Ave, Fontana, San Bernardino County, CA	Gordon, Beth / Rescom Environmental	2004	Reconnaissance	Overall study area
SB-04661	Cultural Resource Records Search and Site Visit Results for Cingular Telecommunications Facility Candidate Es-049-01 (Village Oaks Reservoir), 15532 Live Oaks Road, Chino Hills, San Bernardino County, California	Bonner, Wayne H. And Aislin-Kay, Marnie	2005	Reconnaissance	Overall study area
SB-04662	Archaeological Monitoring Report, Chino Hills Corporate Park, City of Chino Hills, San Bernardino County, California	Carmack, Shannon, Brooks Smith, And Deborah Mclean	2006	Monitoring	Overall study area
SB-04754	Cultural Resource Records Search and Site Visit Results for Cingular Telecommunications Facility Candidate Es-0007-01 (Peyton Drive SCE Tower), South of Lost Trail Drive, Chino Hills, San Bernardino County, California	Bonner, Wayne H.	2005	Reconnaissance	Overall study area
SB-04755	Cultural Resource Records Search Results for Cingular Telecommunications Facility Candidate Es-0016-02 (Abacherli Silo), 17954 Euclid Avenue, Chino Hills, San Bernardino County, California	Bonner, Wayne H.	2005	Field Survey	Overall study area
SB-05189	Cultural Resource Records Search and Site Visit Results for Cingular Telecommunications Facility Candidate 2050 Carbon Canyon Road, Chino Hills, San Bernardino County, California 91709	Bonner, Wayne H., Aislin-Kay, Marnie, And Loupe, Alynne	2005	Field Survey	Overall study area
SB-05416	Unknown	Unknown	Unknown	Unknown	Overall study area

SCCIC Report Number	Title of Study	Author and Affiliation	Year	Type	Location
SB-05703	Records Search Results for The Proposed Nextel Wireless Communications Site (CA-5338B “Jurassic”) Located At 16150 Pomona Rincon Road, Chino Hills, California.	Wlodarski, Robert J.	2005	Field Survey	Overall study area
SB-05709*	**Cultural Resources Assessment: The Shoppes at Chino Hills, San Bernardino County, California.**	**Ewers, Daniel**	**2004**	**Field Survey**	**The Shoppes; The Shoppes II**
SB-06095	Confidential Cultural Resources Specialist Report for The Tehachapi Renewal Transmission Project.	Applied Earthworks / Applied Earthworks	2009	Field Survey	Overall study area
SB-06096	Unknown	Unknown	Unknown	Unknown	Overall study area
SB-06097	Cultural Resources Technical Report: Fire Mitigation, Chino Valley Independent Fire District.	URS Corporation / URS Corporation	2007	Field Survey	Overall study area
SB-06098	Unknown	Unknown	Unknown	Unknown	Overall study area
SB-06219	Unknown	Unknown	Unknown	Unknown	Overall study area
SB-06220*	**Identification And Evaluation of Historic Properties: Recycled Water Reservoirs R-41, R-42 & R-43, City of Chino Hills, San Bernardino County, California**	**Eddy, John J. And Bai "Tom" Tang / CRM Tech**	**2008**	**Field Survey**	**Canyon Estates**
SB-06264	Unknown	Unknown	Unknown	Unknown	Overall study area
SB-06265	Direct Ape Historic Structural Assessment for Cingular Telecommunications Facility Candidate Sv-029-02 (SCE M3-T5 CHP & Grand) Phillips Ranch Road, Chino Hills, San Bernardino County, California.	Bonner, Wayne H. And Kathleen Crawford	2005	Field Survey	Overall study area
SB-06323*	**Unknown**	**Unknown**	**Unknown**	**Unknown**	**Western Hills Country Club**
SB-06424	Unknown	Unknown	Unknown	Unknown	Overall study area

SCCIC Report Number	Title of Study	Author and Affiliation	Year	Type	Location
SB-06425	Addendum To Historical/Archaeological Survey Report: Recycled Water Reservoirs R-41, R-42 And R-43, City of Chino Hills, San Bernardino County, California.	Tang, Bai "Tom" / CRM Tech	2009	Field Survey	Overall study area
SB-06426	Wo 6234-4800; 9-4868 Butterfield 12Kv Deteriorated Pole Replacement Project, Prado Flood Control Basin, Army Corps of Engineers, San Bernardino County, California.	Schmidt, June A. / Compass Rose	2009	Field Survey	Overall study area
SB-06428	DWO 6034-4800; 9-4868- San Bernardino County Deteriorated Pole Replacement Project, Quinto 12Kv, Del Carbon 12Kv And Verde 12Kv Distribution Circuits, San Bernardino County, California.	Schmidt, June	2009	Field Survey	Overall study area
SB-06665	Identification And Evaluation of Historic Properties: 930 Zone Recycled Water Project, Cities of Chino Hills, Chino and Ontario, San Bernardino County, California.	Hogan, Michael, Deirdre Encarnacion, Harry M. Quinn, Daniel Ballester, And Laura Hensley Shaker / CRM Tech	2009	Field Survey	Overall study area
SB-06734	Archaeological Survey Report for Southern California Edison's Pole Replacement Project: Chino Hills, San Bernardino County, California, Wo 6034-4800, 0-4887.	Sander, Jay K. / Chambers Group	2010	Field Survey	Overall study area
SB-06735	Archaeological Survey Report for The Chino-Villa Park (Aka) Chino-Barre 220Kv Transmission Line Lst2 and Lst1 Removal Project, Chino Hills, San Bernardino County, California.	Glentis, Dionisios / Southern California Edison	2010	Field Survey	Overall study area
SB-06787	Historical/Archaeological Resources Survey Report: Chino Groundwater Basin Dry-Year Yield Program Expansion, Los Angeles, Riverside and San Bernardino Counties, California.	Tang, Bai “Tom”, Deirdre Encarnacion, And Daniel Ballester / CRM Tech	2008	Field Survey	Overall study area
SB-06972	Archaeological Literature Review for The Los Serranos Hills Project, San Bernardino County, California.	Gust, Sherri, Sandra Pentney, And Steven Mccormick / Cogston	2004	Reconnaissance	Overall study area
SB-06973	Evaluation Of Archaeological Site Significance for The Vila Borba Project, City of Chino Hills, San Bernardino County, California.	Puckett, Heather, Sherri Gust, And Brian Glenn / Cogstone	2005	Site Testing	Overall study area

SCCIC Report Number	Title of Study	Author and Affiliation	Year	Type	Location
SB-06974	Archaeological Resources Mitigation and Monitoring Report for The Casenave Project, Chino Hills, California.	Gust, Sherri and Veronica Harper / Cogstone	2009	Monitoring	Overall study area
SB-06977	Archaeological Records Search Results, Chino Hills High School.	Mckenna, Jeanette A. / Mckenna et al	2010	Reconnaissance	Overall study area
SB-07083*	**Paleontological And Cultural Resources of Chino Hills for The General Plan Update, City of Chino Hills, California.**	**Gust, Sherri and Molly Valasik / Cogstone**	**2011**	**Reconnaissance**	**All**
SB-07122	Archaeological Survey Report, Tehachapi Renewable Transmission Project Segment 8 Telecommunications Route, Los Angeles and San Bernardino Counties, California.	Panich, Lee and John Holson	2010	Field Survey	Overall study area
SB-07123*	**Supplemental Archaeological Survey Report, 66Kv Transmission Lines Access Roads, Tehachapi Renewable Transmission Project Segments & And 8, Los Angeles and San Bernardino Counties, California.**	**Panich, Lee and John Holson**	**2010**	**Field Survey**	**The Commons**
SB-07180	Cultural Resources Records Search and Site VISJ Results for T-Mobile USA Candidate Ie24628-B (Medical Condo Bldg), 15944 Los Serranos Country Club Drive, Chino Hills, San Bernardino County, California.	Bonner, Wayne H. And Sarah A. Williams / Michael Brandman Associates	2011	Field Survey	Overall study area
SB-07203	Unknown	Unknown	Unknown	Unknown	Overall study area
SB-07318	Archaeological Survey Report for Southern California Edison Company's Replacement of Three Deteriorated Power Pole Structures: Interpace 33Kv/Ceramic 4Kv; Blanco 12Kv; and Del Carbon 12Kv Circuits Riverside and San Bernardino Counties	Schmidt, James / Compass Rose	2012	Field Survey	Overall study area
SB-07441	Phase I Cultural Resources Survey for The Overton Butterfield Ranch Apartments Project, Chino Hills, San Bernardino County, CA	Hannah Haas, Kevin Hunt, And Robert Ramirez / Rincon	2013	Field Survey	Overall study area

SCCIC Report Number	Title of Study	Author and Affiliation	Year	Type	Location
SB-07445	Chino Hills State Park Entrance Road Facilities	Newland, Jim / Ca Dept of Parks & Recreation	2012	Field Survey	Overall study area
SB-07903	City Of Chino Hills Trumark Homes Mixed Use Development Project	Haas, Hannah, Breana Campbell, And Christopher Duran / Rincon Consultants	2015	Field Survey	Overall study area
SB-07904	City Of Chino Hills Indus Light Industrial Building Project	Campbell, Breana and Christopher Duran / Rincon Consultants	2015	Field Survey	Overall study area
SB-07925	Chino Hills Underground, Segment 8 Supplemental Survey For 17 Areas for The Tehachapi Renewable Transmission Project, Los Angeles County, California	Greenberg, Marc / Pacific Legacy	2014	Field Survey	Overall study area
SB-07926	Chino Hills Underground, Segment 8 Supplemental Survey for Vegetation Removal for The Tehachapi Renewable Transmission Project, San Bernardino County, California	Greenberg, Marc / Pacific Legacy	2014	Field Survey	Overall study area
SB-07928	Supplemental Survey for Two Water Stand Tanks in Support of the 500 Kv Underground, Segment 8, SCE Tehachapi Renewable Transmission Project, San Bernardino County, California	Greenberg, Marc / Pacific Legacy	2014	Field Survey	Overall study area
SB-07931	NRHP / CRHRE Legibility Evaluation 14575 Pipeline Avenue, Chino Hills, CA 91709	Tinsley, Wendy L. / Urbana Preservation & Planning	2013	Site Testing	Overall study area
SB-07949	An Archaeological Survey Report for The San Bernadino Unit 2015 Preparedness Exercise, San Bernadino County, California	Velasquez, Stephanie / Cal Fire	2015	Field Survey	Overall study area
SB-07981	TRTP Cultural Report with Negative Findings; Segment 8 Transmission Line Chino Hills (Phase 1)	Panich, Lee / Pacific Legacy, Inc.	2010	Field Survey	Overall study area
SB-08258	Cultural Resources Analysis for The Coptic Orthodox Church Project, City of Chino Hills, San Bernardino County, California	Szromba, Meagan and Christopher A. Duran / Rincon Consultants, Inc.	2016	Field Survey	Overall study area

SCCIC Report Number	Title of Study	Author and Affiliation	Year	Type	Location
SB-08272	Cultural Resources Assessment, Santa Ana River Parkway Project, County of Orange, California	Gibson, Heather, Marc A. Beherec, Patrick Mcginnis, And Mark Roeder / AECOM	2014	Field Survey	Overall study area

* Study overlaps one or more of the RHNA sites.

Table A-2. Previously Recorded Cultural Resources within the Study Area

Primary Number	Trinomial	Age	Type of Resource	Description	Recorded by and Year
P-36-002319	CA-SBR-002319	Prehistoric	Archaeological	Old Casa Colina Hospital Site	1980 (Douglas)
P-36-002374	CA-SBR-002374	Prehistoric	Archaeological	Carbon Creek Ranch #1	1977 (Drover)
P-36-003690	CA-SBR-003690/H	Prehistoric, historic	Multi-component	Aliso Canyon Site	1975 (E. Ritter); 1980 (Douglas); 2008 (LINDER)
P-36-004033	CA-SBR-004033H	Prehistoric, Historic	Multi-component	Soquel Canyon Site; McDermont Ranch	1980 (Douglas)
P-36-004212	CA-SBR-004212	Prehistoric	Archaeological	Los Serranos Site	1980 (Breece); 1999 (I. Strudwick, LSA); 1999 (I. Strudwick, LSA)
P-36-005096	CA-SBR-005096	Prehistoric	Archaeological	Prado Flood Control Basin Site; PA-S-P-01	1980 (Douglas, LSA); 1982 (M. Macko); 2017 (R. Droessler, ICF)
P-36-005097	CA-SBR-005097/H	Prehistoric, historic	Multi-component	Rolling M Ranch	1982 (Macko); 2002 (Carver)
P-36-005245	CA-SBR-005245	Prehistoric	Archaeological	Lusk Site	1983 (Langenwalter / Brock, ECOS); 1999 (I. Strudwick, LSA); 1999 (I. Strudwick, LSA)
P-36-005280	CA-SBR-005280	Prehistoric	Archaeological	CH-7	1984 (Evans / Hood); 1987 (Moran)
P-36-005282	CA-SBR-005282	Prehistoric	Archaeological	CH-9	1984 (Evans / Hood)
P-36-005283	CA-SBR-005283	Prehistoric	Archaeological	FC-5	1983 (Alcorn / Norris)
P-36-005284	CA-SBR-005284	Prehistoric	Archaeological	FC-13	1983 (Alcorn / Dean / Crum)
P-36-005285	CA-SBR-005285	Prehistoric	Archaeological	FC-14	1983 (Alcorn / Dean / Crum)
P-36-005287	CA-SBR-005287	Prehistoric	Archaeological	FC-15	1982 (Alcorn / Dean)
P-36-005689	CA-SBR-005689H	Historic	Built environment	The Adobe	1980 (Van Horn)
P-36-005690	CA-SBR-005690	Prehistoric	Archaeological	None	1980 (Murray / Brock)
P-36-005691	CA-SBR-005691	Prehistoric	Archaeological	None	1980 (Murray / Brock)
P-36-005692	CA-SBR-005692	Prehistoric	Archaeological	None	1980 (Murray / Brock)
P-36-005693	CA-SBR-005693	Prehistoric	Archaeological	None	1980 (Murray / Brock)
P-36-005694	CA-SBR-005694	Prehistoric	Archaeological	None	1986 (Brock)
P-36-006236	CA-SBR-006236	Prehistoric	Archaeological	None	1988 (Jang)
P-36-006239	CA-SBR-006239H	Prehistoric, historic	Multi-component	None	1981 (McKenna et al.)

Primary Number	Trinomial	Age	Type of Resource	Description	Recorded by and Year
P-36-006241	CA-SBR-006241H	Historic	Archaeological	H & M Temp. B	1989 (McKenna et al.)
P-36-006242	CA-SBR-006242H	Historic	Built environment	H & M Temp. C	1989 (McKenna et al.)
P-36-006243	CA-SBR-006243H	Historic	Archaeological	H & M Temp. D	1989 (McKenna et al.)
P-36-006244	CA-SBR-006244H	Historic	Built environment	H & M Temp. E	1989 (McKenna et al.)
P-36-006245	CA-SBR-006245H	Historic	Built environment	H & M Temp. F	1989 (McKenna et al.)
P-36-006246	CA-SBR-006246H	Historic	Built environment	H & M Temp. G	1989 (McKenna et al.)
P-36-006247	CA-SBR-006247H	Historic	Built environment	H & M Temp. I	1989 (McKenna et al.)
P-36-006574	CA-SBR-006574H	Historic	Archaeological	6138-1; Site 1 Hunters Hill	1989 (Solheid); 1991 (ACS)
P-36-006575	CA-SBR-006575H	Historic	Archaeological	6138-2; Hunters Hill - Site 2; P872-83-H	1989 (Solheid); 1991 (ACS)
P-36-006576	CA-SBR-006576H	Historic	Archaeological	Hunters Hill Site 3	1989 (Solheid, Chambers Group); 1991 (ACS)
P-36-006577	CA-SBR-006577H	Historic	Archaeological	6138-4; Hunter's Hill-Site 4	1989 (Farnsworth); 1991 (ACS)
P-36-006578	CA-SBR-006578H	Prehistoric, Historic	Multi-component	6138-5; Site 5	1989 (Farnsworth); 1991 (ACS)
P-36-006817	CA-SBR-006817H	Historic	Archaeological	Pomona-Rincon Road	1991 (J. McKenna, McKenna et al); 2017 (McGinnis, ICF)
P-36-007002	CA-SBR-007002H	Historic	Archaeological	Hunter's Hill - Site 6	1991 (ACS)
P-36-007003	CA-SBR-007003H	Historic	Archaeological	Hunter's Hill - Site 7	1991 (ACS)
P-36-007004	CA-SBR-007004H	Historic	Archaeological	Hunters Hill- Site 8	1991 (ACS)
P-36-007005	CA-SBR-007005H	Historic	Archaeological	Hunter's Hill - Site 9	1991 (ACS)
P-36-007006	CA-SBR-007006H	Historic	Archaeological	Site 10	1991 (ACS)
P-36-007007	CA-SBR-007007H	Historic	Archaeological	Hunter's Hill Site 11	1991 (ACS)
P-36-007009	CA-SBR-007009H	Historic	Archaeological	Hunters Hill Site 13	1991 (ACS)

Primary Number	Trinomial	Age	Type of Resource	Description	Recorded by and Year
P-36-007010	CA-SBR-007010H	Historic	Archaeological	Hunters Hill- Site 14	1991 (Alexandrowicz, ACS)
P-36-007046	CA-SBR-007046H	Prehistoric, Historic	Multi-component	Kramer Farm / Ranch Pumphouse	1991 (Sturm); 1993 (Kuhner / Knell); 1999 (I. Strudwick, LSA)
P-36-007972	CA-SBR-007972	Prehistoric, historic	Multi-component	Borba Ranch; ACS-TK1	1993 (A. Kuhner, Archaeological Consulting Services); 2005 (A. Abeyta, Cogstone)
P-36-007973	CA-SBR-007973H	Historic	Archaeological	ACS-ZKI	1993 (A. Kuhner)
P-36-008124	CA-SBR-008124H	Historic	Archaeological	Arnold Ranch complex	1995 (S.M. Owen)
P-36-008125	CA-SBR-008125H	Historic	Built environment	Multiple arch dam	1995 (S.M. Owen)
P-36-008694	CA-SBR-008694	Prehistoric	Archaeological	Richland; MP-1	1997 (P. Maxon, RMW Paleo Associates)
P-36-009371	CA-SBR-009371	Prehistoric	Archaeological	Polygon	1998 (Mon)
P-36-009398	CA-SBR-009398	Prehistoric	Archaeological	Unknown	1998 (T. Goddard, RMW Paleo Associates)
P-36-009399	CA-SBR-009399	Prehistoric	Archaeological	Polygon 4	1998 (Maxon, RMW Paleo)
P-36-009564	CA-SBR-009564H	Historic	Archaeological		1998 (P. Maxon, RMW Paleo Solutions)
P-36-009895	CA-SBR-009895	Historic	Archaeological	Fairfield Ranch Stand Pipes	1999 (Struckwick and King, LSA Associates, Inc.); 1999 (Struckwick and King, LSA Associates, Inc.)
P-36-009939	CA-SBR-009939	Historic	Archaeological	Fairfield Ranch Historic Trash Scatter	1999 (Strudwick and King, LSA Associates, Inc.)
P-36-010603	CA-SBR-010603	Prehistoric	Archaeological	CRM Tech 729-1	2002 (D. Ballester, CRM Tech)
P-36-010604	CA-SBR-010604H	Historic	Archaeological	CRM Tech 729-2H	2002 (D. Ballester, CRM Tech)
P-36-010714	CA-SBR-010714/H	Prehistoric, historic	Multi-component	CH Temp 1	2002 (Clifford)
P-36-010715	CA-SBR-010715	Prehistoric	Archaeological	CH Temp 2	2002 (Clifford)
P-36-010821	CA-SBR-010821	Prehistoric	Archaeological		2002 (K. Buffington, LSA)
P-36-012237		Prehistoric	Archaeological	LSA-RIL430-ISO-01	2004 (S. Carmack)
P-36-012238		Prehistoric	Archaeological	LSA-RIL430-ISO-02	2004 (S. Carmack, LSA); 2005 (D. Christensen)
P-36-012493	CA-SBR-012278	Prehistoric	Archaeological	McDermott Spring Site	2005 (California Department of Parks & Recreation)

Primary Number	Trinomial	Age	Type of Resource	Description	Recorded by and Year
P-36-012521		Historic	Built environment	Los Serranos neighborhood	2004 (CRM TECH); 2015 (Rincon Consultants)
P-36-012522		Historic	Built environment	Los Serranos neighborhood	2004 (CRM TECH); 2015 (Rincon Consultants)
P-36-012523		Historic	Built environment	Los Serranos neighborhood	2004 (CRM TECH); 2015 (Rincon Consultants)
P-36-012524		Historic	Built environment	Los Serranos neighborhood	2004 (CRM TECH); 2015 (Rincon Consultants)
P-36-012525		Historic	Built environment	Los Serranos neighborhood	2004 (CRM TECH); 2015 (Rincon Consultants)
P-36-012526		Historic	Built environment	Los Serranos neighborhood	2004 (CRM TECH); 2015 (Rincon Consultants)
P-36-012527		Historic	Built environment	Los Serranos neighborhood	2004 (CRM TECH); 2015 (Rincon Consultants)
P-36-012528		Historic	Built environment	Los Serranos neighborhood	2004 (CRM TECH); 2015 (Rincon Consultants)
P-36-013390	CA-SBR-012570H	Historic	Archaeological	PL-SCE Tehachapi-24H	2007 (Blind)
P-36-013627	CA-SBR-012613H	Historic	Built environment	Southern Sierras Powerline	2007 (M. Dice, MBA); 2011 (R. Hoffman, ICS); 2012 (J. Sanka, W. Gilleean, Atkins); 2017 (McGinnis, ICF); 2019 (T.A. Stropes, BFSA)
P-36-015215*		Historic	Undefined	Chino Station; Battle of Chino; Butterfield Stage (Rancho Chino Marker)	1974 (Unknown)
P-36-015220*		Historic	Archaeological	BR 54-100, SR-142 over Carbon Canyon (bridge)	1979 (Unknown)
P-36-019845	CA-SBR-013198H	Historic	Archaeological	AE-1641-1H	2008 (Linder)
P-36-019846	CA-SBR-013199H	Historic	Archaeological	AE-1641-2H	2008 (Price)
P-36-019847	CA-SBR-013200H	Historic	Built environment	AE-1641-3H	2008 (Linder)
P-36-020465		Historic	Built environment	Caballero Farm	2004 (J. Marvin, LSA)
P-36-020466		Historic	Built environment	Aguilera Farm	2004 (J. Marvin, LSA)
P-36-020467		Prehistoric	Archaeological		2004 (J. and J. Kline, LSA)
P-36-021486		Undefined	Archaeological	AE-Topock-144H	2009 (Applied Earthworks)
P-36-021494		Prehistoric	Archaeological	PL-SCE-SEG8-ISO-02	2010 (M. Greenberg, Pacific Legacy, Inc.)

Primary Number	Trinomial	Age	Type of Resource	Description	Recorded by and Year
P-36-022188	CA-SBR-014131H	Historic	Archaeological	LSA-FCH1001 S-1	2010 (LSA)
P-36-023511	CA-SBR-014839H	Prehistoric, Historic	Multi-component	Site 1	2011 (Warner)
P-36-023512	CA-SBR-014840H	Prehistoric, Historic	Multi-component	Site 2	2011 (Warner)
P-36-023513	CA-SBR-014841H	Prehistoric, Historic	Multi-component	Site 3	2011 (Warner)
P-36-023514	CA-SBR-014842	Prehistoric	Archaeological	Site 4	2011 (Warner)
P-36-023515		Prehistoric	Archaeological	Isolate 1	2011 (Warner)
P-36-023516		Prehistoric	Archaeological	Isolate 2	2011 (Warner)
P-36-023517		Prehistoric	Archaeological	Isolate 3	2011 (Warner)
P-36-025439		Historic	Built environment	Southern California Edison Co (SCE) Chino-Mesa 220 kV Transmission Line	2010 (Wendy L. Tinsley Becker, Urbana Preservation & Planning)
P-36-025441		Historic	Built environment	SCE Edison Co. Chino-Soquel 220 kV Transmission Line	2010 (Becker, Urbana Preservation and Planning)
P-36-028588		Historic	Archaeological	2015DMK0526-I-01	2015 (Cogstone)
P-36-029684		Historic	Built environment	Commercial building, 14575 Pipeline Avenue	2013 (W.L. Tinsley Becker, Urbana Preservation & Planning, LLC)
P-36-031249		Historic	Archaeological	Higgins Brick Co.	2017 (I. Strudwick, LSA Associates)
P-36-031828	CA-SBR-031828/H	Prehistoric, historic	Multi-component	C-0116-001/H	2015 (N.F. Hearth, Duke CRM)
P-36-031829	CA-SBR-031829	Prehistoric	Archaeological	C-0116-002	2016 (R. Mora, Duke CRM)
P-36-032872		Prehistoric	Archaeological	C-0238-ISO-001	2018 (A. DeLeon, Duke CRM)
P-36-033022	CA-SBR-033022/H	Prehistoric, historic	Multi-component	2018_10_23_AR_1	2018 (J. Gust, Cogstone)
P-36-033023		Historic	Built environment	Chino Hills Reservoir No. 1	2018 (M. Wilson, Cogstone)
P-36-033055		Historic	Archaeological	Dan Durkee Ditch	1999 (I. Strudwick, LSA)
P-36-033597		Historic	Archaeological	2019-07-25-TP.001	2019 (T. Perry, Cogstone)
P-36-060003		Prehistoric	Archaeological	CH-5	1984 (Evans)
P-36-060004		Prehistoric	Archaeological	CH-8	1984 (Evans)
P-36-060005		Prehistoric, historic	Multi-component	FC-4	1983 (Alcorn)

Primary Number	Trinomial	Age	Type of Resource	Description	Recorded by and Year
P-36-060006		Prehistoric	Archaeological	CH-6	1984 (Evans)
P-36-060007		Prehistoric	Archaeological	CH-3	1983 (Hood)
P-36-060008		Prehistoric	Archaeological	CH-2	1983 (Evans)
P-36-060009		Prehistoric	Archaeological	CH-4	1984 (Hood)
P-36-060010		Prehistoric	Archaeological	FC 6	1983 (Alcorn, Fullerton College)
P-36-060011		Prehistoric	Archaeological	FC-3	1983 (Alcorn)
P-36-060012		Prehistoric	Archaeological	FC-8	1983 (Alcorn)
P-36-060013		Prehistoric	Archaeological	FC-7	1983 (Alcorn)
P-36-060014		Prehistoric	Archaeological	FC-18	1984 (Alcorn)
P-36-060015		Prehistoric	Archaeological	FC-1	1983 (Alcorn)
P-36-060016		Prehistoric	Archaeological	FC-9	1983 (Alcorn)
P-36-060017		Prehistoric	Archaeological	FC-16	1984 (Alcorn)
P-36-060018		Prehistoric	Archaeological	FC-2	1983 (Alcorn)
P-36-060019		Prehistoric	Archaeological	FC-10	1983 (Alcorn)
P-36-060020		Prehistoric	Archaeological	FC-11	1983 (Alcorn)
P-36-060021		Prehistoric	Archaeological	CH-1	1983 (Hood)
P-36-060022		Prehistoric	Archaeological	FC-17	1984 (Alcorn)
P-36-060023		Prehistoric	Archaeological	FC-12	1983 (Alcorn)
P-36-060024		Prehistoric	Archaeological	Mano fragment	1980 (Douglas)
P-36-060031		Prehistoric	Archaeological		1989 (Del Chario)
P-36-060033		Prehistoric	Archaeological	Field Locality 6-29.2	1984 (Jenson)
P-36-060034		Prehistoric	Archaeological	Soquel Isolate 1	1990 (McManis)
P-36-060035		Prehistoric	Archaeological	Soquel Isolate 2	1990 (McManis)
P-36-060036		Prehistoric	Archaeological	Soquel Isolate 3	1990 (McManis)
P-36-060037		Prehistoric	Archaeological		1991 (J. McKenna, McKenna et al)
P-36-060038		Prehistoric	Archaeological	LR-2	1986 (Brock, Archaeological Advisory Group)
P-36-060039		Prehistoric	Archaeological	LR-3	1986 (Brock, Archaeological Advisory Group)
P-36-060040		Historic	Archaeological	LR-4	1986 (J. Brock, Archaeological Advisory Group)

Primary Number	Trinomial	Age	Type of Resource	Description	Recorded by and Year
P-36-060041		Historic	Archaeological	LR-5	1986 (J. Brock, Archaeological Advisory Group)
P-36-060042		Prehistoric	Archaeological	H & M Isolate No. 1	1989 (McKenna)
P-36-060043		Prehistoric	Archaeological	TCP-1	1995 (Owen, EIP)
P-36-060248		Prehistoric	Archaeological	Polygon 5	1998 (P. Maxon, RMW Paleo Associates)
P-36-064202		Historic	Archaeological	Fairfield Ranch Isolate No. 1	1999 (I. Strudwick and G. King, LSA)
P-36-064230		Prehistoric	Archaeological	Isolate LSA-FR-I-2	1999 (I. Strudwick and G. King, LSA)
P-36-064360		Prehistoric	Archaeological	Chert-in-the-Road	2000
P-36-064533		Prehistoric	Archaeological	Chino Hills Isolate #1	2002
N/A	CA-SBR-002319	Historic	Built environment	Peyton Drive SCE Tower	2005 (Unknown)
N/A	CA-SBR-002374	Historic	Built environment	Rolling M Ranch Historic District	2008 (Unknown)
N/A	CA-SBR-003690/H	Historic	Built environment	Chinto Ave SCE Transmission Tower	2006 (Unknown)
N/A	CA-SBR-004033H	Historic	Built environment	Chino-Ganesha Transmission Tower	2005 (Unknown)
N/A	CA-SBR-004212	Historic	Built environment	Aguilera Farm, 3320 Chino Hills Parkway	2005 (Unknown)
N/A	CA-SBR-005096	Historic	Built environment	4217 Los Serrance Blvd.	2001 (Unknown)
N/A	CA-SBR-005097/H	Historic	Built environment	14660 Lost Trail Drive	2000 (Unknown)
N/A	CA-SBR-005245	Historic	Built environment	Single-family home and barn, 14566 Peyton Drive	2005 (Unknown)
N/A	CA-SBR-005280	Historic	Built environment	14575 Pipeline Avenue	2014 (Unknown)
N/A	CA-SBR-005282	Historic	Built environment	SCE Tower M-3	2003 (Unknown
N/A	CA-SBR-005283	Historic	Built environment	Chino Creek Bridge (Bridge #54-0426)	2003 (Unknown)

* Information for this resource was augmented by the paleontological and cultural resources study prepared for a previous Chino Hills General Plan Update EIR (Gust and Valasik 2011).
Note: N/A = not applicable.

APPENDIX B

Native American Heritage Commission Sacred Lands File Search Results Letter

CONFIDENTIAL – NOT FOR PUBLIC RELEASE

NATIVE AMERICAN HERITAGE COMMISSION

CHAIRPERSON
Laura Miranda
Luiseño

VICE CHAIRPERSON
Reginald Pagaling
Chumash

PARLIAMENTARIAN
Russell Attebery
Karuk

SECRETARY
Sara Dutschke
Miwok

COMMISSIONER
William Mungary
Paiute/White Mountain Apache

COMMISSIONER
Isaac Bojorquez
Ohlone-Costanoan

COMMISSIONER
Buffy McQuillen
Yokayo Pomo, Yuki, Nomlaki

COMMISSIONER
Wayne Nelson
Luiseño

COMMISSIONER
Stanley Rodriguez
Kumeyaay

EXECUTIVE SECRETARY
Raymond C. Hitchcock
Miwok/Nisenan

NAHC HEADQUARTERS
1550 Harbor Boulevard
Suite 100
West Sacramento,
California 95691
(916) 373-3710
nahc@nahc.ca.gov
NAHC.ca.gov

June 13, 2022

Liz Denniston
SWCA Environmental Consultants

Via Email to: liz.denniston@swca.com

Re: City of Chino Hills General Plan Update EIR Project, San Bernardino County

Dear Ms. Denniston:

A record search of the Native American Heritage Commission (NAHC) Sacred Lands File (SLF) was completed for the information submitted for the above referenced project. The results were positive. Please contact the Gabrieleno/Tongva San Gabriel Band of Mission Indians on the attached list for information. Please note that tribes do not always record their sacred sites in the SLF, nor are they required to do so. A SLF search is not a substitute for consultation with tribes that are traditionally and culturally affiliated with a project's geographic area. Other sources of cultural resources should also be contacted for information regarding known and recorded sites, such as the appropriate regional California Historical Research Information System (CHRIS) archaeological Information Center for the presence of recorded archaeological sites.

Attached is a list of Native American tribes who may also have knowledge of cultural resources in the project area. This list should provide a starting place in locating areas of potential adverse impact within the proposed project area. Please contact all of those listed; if they cannot supply information, they may recommend others with specific knowledge. By contacting all those listed, your organization will be better able to respond to claims of failure to consult with the appropriate tribe. If a response has not been received within two weeks of notification, the Commission requests that you follow-up with a telephone call or email to ensure that the project information has been received.

If you receive notification of change of addresses and phone numbers from tribes, please notify the NAHC. With your assistance, we can assure that our lists contain current information.

If you have any questions or need additional information, please contact me at my email address: Andrew.Green@nahc.ca.gov.

Sincerely,

Andrew Green

Andrew Green
Cultural Resources Analyst

Attachment

Native American Heritage Commission
Native American Contact List
San Bernardino County
6/13/2022

Gabrieleno Band of Mission Indians - Kizh Nation
Andrew Salas, Chairperson
P.O. Box 393 — Gabrieleno
Covina, CA, 91723
Phone: (626) 926 - 4131
admin@gabrielenoindians.org

Gabrieleno/Tongva San Gabriel Band of Mission Indians
Anthony Morales, Chairperson
P.O. Box 693 — Gabrieleno
San Gabriel, CA, 91778
Phone: (626) 483 - 3564
Fax: (626) 286-1262
GTTribalcouncil@aol.com

Gabrielino /Tongva Nation
Sandonne Goad, Chairperson
106 1/2 Judge John Aiso St., #231 — Gabrielino
Los Angeles, CA, 90012
Phone: (951) 807 - 0479
sgoad@gabrielino-tongva.com

Gabrielino Tongva Indians of California Tribal Council
Christina Conley, Tribal Consultant and Administrator
P.O. Box 941078 — Gabrielino
Simi Valley, CA, 93094
Phone: (626) 407 - 8761
christina.marsden@alumni.usc.edu

Gabrielino Tongva Indians of California Tribal Council
Robert Dorame, Chairperson
P.O. Box 490 — Gabrielino
Bellflower, CA, 90707
Phone: (562) 761 - 6417
Fax: (562) 761-6417
gtongva@gmail.com

Gabrielino-Tongva Tribe
Charles Alvarez,
23454 Vanowen Street — Gabrielino
West Hills, CA, 91307
Phone: (310) 403 - 6048
roadkingcharles@aol.com

Juaneno Band of Mission Indians Acjachemen Nation - Belardes
Matias Belardes, Chairperson
32161 Avenida Los Amigos — Juaneno
San Juan Capisttrano, CA, 92675
Phone: (949) 293 - 8522
kaamalam@gmail.com

Juaneno Band of Mission Indians Acjachemen Nation - Belardes
Joyce Perry, Tribal Manager
4955 Paseo Segovia — Juaneno
Irvine, CA, 92603
Phone: (949) 293 - 8522
kaamalam@gmail.com

Pala Band of Mission Indians
Shasta Gaughen, Tribal Historic Preservation Officer
PMB 50, 35008 Pala Temecula Rd. — Cupeno, Luiseno
Pala, CA, 92059
Phone: (760) 891 - 3515
Fax: (760) 742-3189
sgaughen@palatribe.com

Pechanga Band of Indians
Mark Macarro, Chairperson
P.O. Box 1477 — Luiseno
Temecula, CA, 92593
Phone: (951) 770 - 6000
Fax: (951) 695-1778
epreston@pechanga-nsn.gov

Pechanga Band of Indians
Paul Macarro, Cultural Resources Coordinator
P.O. Box 1477 — Luiseno
Temecula, CA, 92593
Phone: (951) 770 - 6306
Fax: (951) 506-9491
pmacarro@pechanga-nsn.gov

This list is current only as of the date of this document. Distribution of this list does not relieve any person of statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resource Section 5097.98 of the Public Resources Code.

This list is only applicable for contacting local Native Americans with regard to cultural resources assessment for the proposed City of Chino Hills General Plan Update EIR Project, San Bernardino County.

Rincon Band of Luiseno Indians
Cheryl Madrigal, Tribal Historic Preservation Officer
One Government Center Lane — Luiseno
Valley Center, CA, 92082
Phone: (760) 297 - 2635
crd@rincon-nsn.gov

Rincon Band of Luiseno Indians
Bo Mazzetti, Chairperson
One Government Center Lane — Luiseno
Valley Center, CA, 92082
Phone: (760) 749 - 1051
Fax: (760) 749-5144
bomazzetti@aol.com

Santa Rosa Band of Cahuilla Indians
Lovina Redner, Tribal Chair
P.O. Box 391820 — Cahuilla
Anza, CA, 92539
Phone: (951) 659 - 2700
Fax: (951) 659-2228
lsaul@santarosa-nsn.gov

Soboba Band of Luiseno Indians
Joseph Ontiveros, Cultural Resource Department
P.O. BOX 487 — Cahuilla
San Jacinto, CA, 92581 — Luiseno
Phone: (951) 663 - 5279
Fax: (951) 654-4198
jontiveros@soboba-nsn.gov

Soboba Band of Luiseno Indians
Isaiah Vivanco, Chairperson
P. O. Box 487 — Cahuilla
San Jacinto, CA, 92581 — Luiseno
Phone: (951) 654 - 5544
Fax: (951) 654-4198
ivivanco@soboba-nsn.gov

This list is current only as of the date of this document. Distribution of this list does not relieve any person of statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resource Section 5097.98 of the Public Resources Code.

This list is only applicable for contacting local Native Americans with regard to cultural resources assessment for the proposed City of Chino Hills General Plan Update EIR Project, San Bernardino County.

May 16, 2022

Andrew Salas, Chairman
Gabrieleno Band of Mission Indians – Kizh Nation
PO Box 393
Covina, CA 91723

SUBJECT: ASSEMBLY BILL (AB) 52 CONSULTATION
- **CITYWIDE GENERAL PLAN UPDATE (22GPA01)**

Dear Mr. Salas,

The City of Chino Hills is conducting a CEQA review for the above referenced Project, which includes a comprehensive General Plan Update for the entire City of Chino Hills.
This letter is sent to inform you about the proposed project and to request your consultation pursuant to AB 52.

The proposed project must comply with California Public Resources Code § 21080.3.1 (Assembly Bill [AB] 52 of 2014), which requires local governments to conduct meaningful consultation with California Native American tribes that have requested to be notified by lead agencies of proposed projects in the geographic area with which the tribe is traditionally and culturally affiliated.

Your tribe's input is important to the City's planning process. We request that you advise us as early as possible if you wish to consult on the proposed project. Under AB 52, you have 30 days from the date of receipt of this notice to advise the City if you are interested in further consultation.

Attached is project location information and location maps. If you require any additional information or have any questions, please contact me at:

Michael Hofflinger
Planning Manager
Community Development Department
City of Chino Hills
14000 City Center Drive
Chino Hills, CA 91709
(909) 364-2777
mhofflinger@chinohills.org

Thank you for your assistance.

Sincerely,
COMMUNITY DEVELOPMENT DEPARTMENT

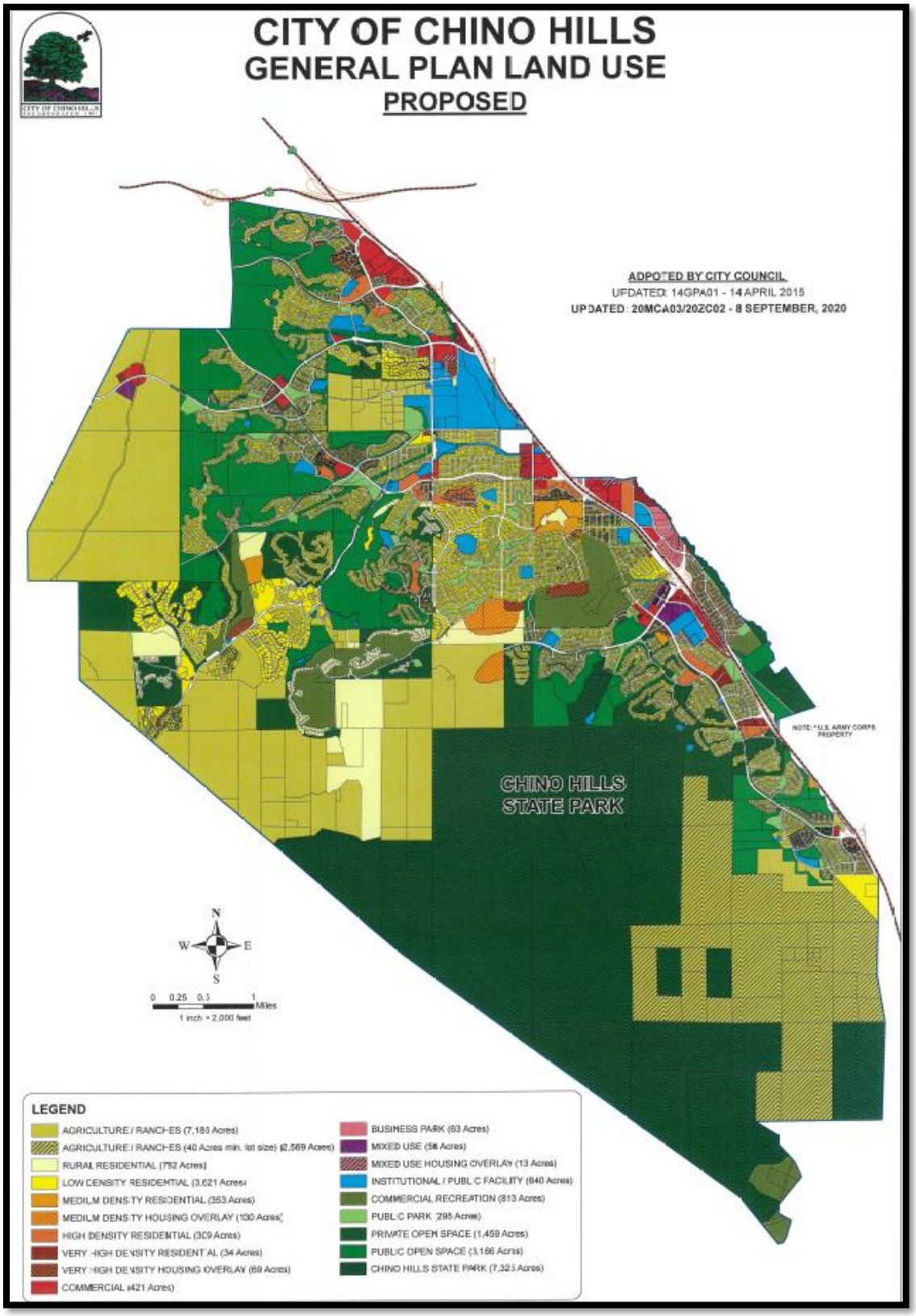
Michael Hofflinger
Planning Manager

Enclosures:
Exhibit 1 City of Chino Hills Regional Location Map
Exhibit 2 City of Chino Hills Proposed General Plan Land Use Map

Exhibit 1


Bakersfield
Santa Barbara
CALIFORNIA
Chino Hills
Los Angeles
San Bernardino
Riverside
Santa Ana
San Diego
MEXICO
Chino Hills, CA
Copyright Sperling's BestPlaces

Exhibit 2


CITY OF CHINO HILLS
GENERAL PLAN LAND USE
PROPOSED
ADOPTED BY CITY COUNCIL
UPDATED: 14GPA01 - 14 APRIL 2015
UPDATED: 20MCA03/20ZC02 - 8 SEPTEMBER, 2020
CHINO HILLS STATE PARK
N
W
E
S
0 0.25 0.5 1 Miles
1 inch = 2,000 feet
LEGEND
AGRICULTURE / RANCHES (7,183 Acres)
AGRICULTURE / RANCHES (40 Acres min. lot size) (2,569 Acres)
RURAL RESIDENTIAL (792 Acres)
LOW DENSITY RESIDENTIAL (3,621 Acres)
MEDIUM DENSITY RESIDENTIAL (353 Acres)
MEDIUM DENSITY HOUSING OVERLAY (100 Acres)
HIGH DENSITY RESIDENTIAL (309 Acres)
VERY HIGH DENSITY RESIDENTIAL (34 Acres)
VERY HIGH DENSITY HOUSING OVERLAY (69 Acres)
COMMERCIAL (421 Acres)
BUSINESS PARK (63 Acres)
MIXED USE (56 Acres)
MIXED USE HOUSING OVERLAY (13 Acres)
INSTITUTIONAL / PUBLIC FACILITY (640 Acres)
COMMERCIAL RECREATION (813 Acres)
PUBLIC PARK (295 Acres)
PRIVATE OPEN SPACE (1,459 Acres)
PUBLIC OPEN SPACE (3,166 Acres)
CHINO HILLS STATE PARK (7,325 Acres)

GABRIELENO BAND OF MISSION INDIANS - KIZH NATION
Historically known as The San Gabriel Band of Mission Indians recognized by the State of California as the aboriginal tribe of the Los Angeles basin

May 25, 2022

Project Name: Citywide General Plan Update (22GPA01), City of Chino hills

Thank you for your letter dated May 16,2022. Regarding the project above. This is to concur that we agree with the General Plan Update. However, our Tribal government would like to request consultation for all future projects within this location.

Andrew Salas, Chairman
Gabrieleno Band of Mission Indians – Kizh Nation

Andrew Salas, Chairman | Nadine Salas, Vice-Chairman | Dr. Christina Swindall Martinez, secretary
Albert Perez, treasurer I | Martha Gonzalez Lemos, treasurer II | Richard Gradias, Chairman of the council of Elders

PO Box 393 Covina, CA 91723 www.gabrielenoindians@yahoo.com gabrielenoindians@yahoo.com

May 16, 2022

Joseph Ontiveros
Cultural Resources Director
Soboba Band of Luiseno Indians
PO Box 487
San Jacinto, CA 92581

SUBJECT: ASSEMBLY BILL (AB) 52 CONSULTATION
- **CITYWIDE GENERAL PLAN UPDATE (22GPA01)**

Dear Mr. Ontiveros,

The City of Chino Hills is conducting a CEQA review for the above referenced Project, which includes a comprehensive General Plan Update for the entire City of Chino Hills.
This letter is sent to inform you about the proposed project and to request your consultation pursuant to AB 52.

The proposed project must comply with California Public Resources Code § 21080.3.1 (Assembly Bill [AB] 52 of 2014), which requires local governments to conduct meaningful consultation with California Native American tribes that have requested to be notified by lead agencies of proposed projects in the geographic area with which the tribe is traditionally and culturally affiliated.

Your tribe's input is important to the City's planning process. We request that you advise us as early as possible if you wish to consult on the proposed project. Under AB 52, you have 30 days from the date of receipt of this notice to advise the City if you are interested in further consultation.

Attached is project location information and location maps. If you require any additional information or have any questions, please contact me at:

Michael Hofflinger
Planning Manager
Community Development Department
City of Chino Hills
14000 City Center Drive
Chino Hills, CA 91709
(909) 364-2777
mhofflinger@chinohills.org

Thank you for your assistance.

Sincerely,
COMMUNITY DEVELOPMENT DEPARTMENT

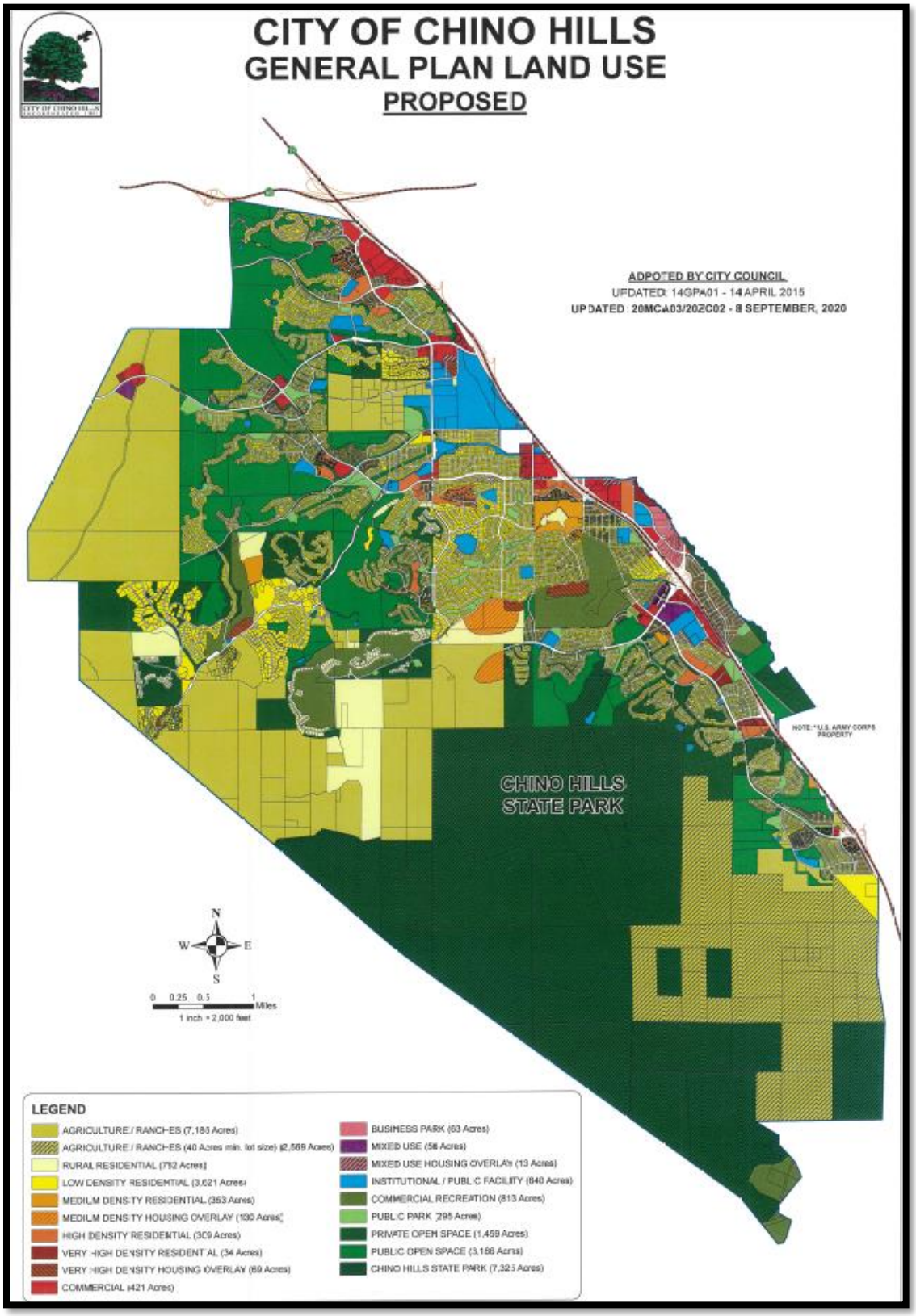
Michael Hofflinger
Planning Manager

Enclosures:
Exhibit 1 City of Chino Hills Regional Location Map
Exhibit 2 City of Chino Hills Proposed General Plan Land Use Map

Exhibit 1


Bakersfield
Santa Barbara
CALIFORNIA
Chino Hills
Los Angeles
San Bernardino
Riverside
Santa Ana
San Diego
MEXICO
Chino Hills, CA
Copyright Sperling's BestPlaces

Exhibit 2


CITY OF CHINO HILLS
GENERAL PLAN LAND USE
PROPOSED
ADOPTED BY CITY COUNCIL
UPDATED: 14GPA01 - 14 APRIL 2015
UPDATED: 20MCA03/20ZC02 - 8 SEPTEMBER, 2020
CHINO HILLS STATE PARK
N
W
E
S
0 0.25 0.5 1 Miles
1 inch = 2,000 feet
LEGEND
AGRICULTURE / RANCHES (7,183 Acres)
AGRICULTURE / RANCHES (40 Acres min. lot size) (2,569 Acres)
RURAL RESIDENTIAL (792 Acres)
LOW DENSITY RESIDENTIAL (3,621 Acres)
MEDIUM DENSITY RESIDENTIAL (353 Acres)
MEDIUM DENSITY HOUSING OVERLAY (100 Acres)
HIGH DENSITY RESIDENTIAL (309 Acres)
VERY HIGH DENSITY RESIDENTIAL (34 Acres)
VERY HIGH DENSITY HOUSING OVERLAY (69 Acres)
COMMERCIAL (421 Acres)
BUSINESS PARK (63 Acres)
MIXED USE (56 Acres)
MIXED USE HOUSING OVERLAY (13 Acres)
INSTITUTIONAL / PUBLIC FACILITY (640 Acres)
COMMERCIAL RECREATION (813 Acres)
PUBLIC PARK (295 Acres)
PRIVATE OPEN SPACE (1,459 Acres)
PUBLIC OPEN SPACE (3,166 Acres)
CHINO HILLS STATE PARK (7,325 Acres)

NATIVE AMERICAN HERITAGE COMMISSION

CHAIRPERSON
Laura Miranda
Luiseño

VICE CHAIRPERSON
Reginald Pagaling
Chumash

PARLIAMENTARIAN
Russell Attebery
Karuk

SECRETARY
Sara Dutschke
Miwok

COMMISSIONER
William Mungary
Paiute/White Mountain Apache

COMMISSIONER
Isaac Bojorquez
Ohlone-Costanoan

COMMISSIONER
Buffy McQuillen
Yokayo Pomo, Yuki, Nomlaki

COMMISSIONER
Wayne Nelson
Luiseño

COMMISSIONER
Stanley Rodriguez
Kumeyaay

EXECUTIVE SECRETARY
Raymond C. Hitchcock
Miwok/Nisenan

NAHC HEADQUARTERS
1550 Harbor Boulevard
Suite 100
West Sacramento,
California 95691
(916) 373-3710
nahc@nahc.ca.gov
NAHC.ca.gov

September 9, 2022

Michael Hofflinger
City of Chino Hills

Via Email to: mhofflinger@chinohills.org

Re: Native American Consultation, Pursuant to Senate Bill 18, Government Code §65352.3 and §65352.4, General Plan Update Project, San Bernardino County

Dear Mr. Hofflinger:

Attached is a consultation list of tribes with traditional lands or cultural places located within the boundaries of the above referenced counties.

Government Code §65352.3 and §65352.4 require local governments to consult with California Native American tribes identified by the Native American Heritage Commission (NAHC) for the purpose of avoiding, protecting, and/or mitigating impacts to cultural places when creating or amending General Plans, Specific Plans and Community Plans.

The law does not preclude initiating consultation with the tribes that are culturally and traditionally affiliated within your jurisdiction. The NAHC believes that this is the best practice to ensure that tribes are consulted commensurate with the intent of the law.

The NAHC also believes that agencies should also include with their notification letters, information regarding any cultural resources assessment that has been completed on the area of potential effect (APE), such as:

1. The results of any record search that may have been conducted at an Information Center of the California Historical Resources Information System (CHRIS), including, but not limited to:

    - A listing of any and all known cultural resources that have already been recorded or are adjacent to the APE, such as known archaeological sites;
    - Copies of any and all cultural resource records and study reports that may have been provided by the Information Center as part of the records search response;
    - Whether the records search indicates a low, moderate or high probability that unrecorded cultural resources are located in the APE; and
    - If a survey is recommended by the Information Center to determine whether previously unrecorded cultural resources are present.

2. The results of any archaeological inventory survey that was conducted, including:

    - Any report that may contain site forms, site significance, and suggested mitigation measures.

All information regarding site locations, Native American human remains, and associated funerary objects should be in a separate confidential addendum, and not be made available for public disclosure in accordance with Government Code §6254.10.

3. The result of the Sacred Lands File (SLF) check conducted through the Native American Heritage Commission. The request form can be found at http://nahc.ca.gov/wp-content/uploads/2015/08/Local-Government-Tribal-Consultation-List-Request-Form-Update.pdf.

4. Any ethnographic studies conducted for any area including all or part of the APE; and

5. Any geotechnical reports regarding all or part of the APE.

Lead agencies should be aware that records maintained by the NAHC and CHRIS are not exhaustive. A tribe may be the only source of information regarding the existence of a tribal cultural resource.

This information will aid tribes in determining whether to request formal consultation. In the event, that they do, having the information beforehand will help to facilitate the consultation process.

If you receive notification of change of addresses and phone numbers from tribes, please notify the NAHC. With your assistance, we are able to assure that our consultation list remains current.

If you have any questions or need additional information, please contact me at my email address: Andrew.Green@nahc.ca.gov.

Sincerely,



Andrew Green
Cultural Resources Analyst

Attachment

Native American Heritage Commission
Tribal Consultation List
San Bernardino County
9/9/2022

Gabrieleno Band of Mission Indians - Kizh Nation
Andrew Salas, Chairperson
P.O. Box 393 Gabrieleno
Covina, CA, 91723
Phone: (626) 926 - 4131
admin@gabrielenoindians.org

Gabrieleno/Tongva San Gabriel Band of Mission Indians
Anthony Morales, Chairperson
P.O. Box 693 Gabrieleno
San Gabriel, CA, 91778
Phone: (626) 483 - 3564
Fax: (626) 286-1262
GTTribalcouncil@aol.com

Gabrielino /Tongva Nation
Sandonne Goad, Chairperson
106 1/2 Judge John Aiso St., #231 Gabrielino
Los Angeles, CA, 90012
Phone: (951) 807 - 0479
sgoad@gabrielino-tongva.com

Gabrielino Tongva Indians of California Tribal Council
Christina Conley, Tribal Consultant and Administrator
P.O. Box 941078 Gabrielino
Simi Valley, CA, 93094
Phone: (626) 407 - 8761
christina.marsden@alumni.usc.edu

Gabrielino Tongva Indians of California Tribal Council
Robert Dorame, Chairperson
P.O. Box 490 Gabrielino
Bellflower, CA, 90707
Phone: (562) 761 - 6417
Fax: (562) 761-6417
gtongva@gmail.com

Gabrielino-Tongva Tribe
Charles Alvarez,
23454 Vanowen Street Gabrielino
West Hills, CA, 91307
Phone: (310) 403 - 6048
roadkingcharles@aol.com

Juaneno Band of Mission Indians Acjachemen Nation - Belardes
Matias Belardes, Chairperson
32161 Avenida Los Amigos Juaneno
San Juan Capisttrano, CA, 92675
Phone: (949) 293 - 8522
kaamalam@gmail.com

Juaneno Band of Mission Indians Acjachemen Nation 84A
Heidi Lucero, Chairperson
31411-A La Matanza Street Juaneno
San Juan Capistrano, CA, 92675
Phone: (562) 879 - 2884
hllucero105@gmail.com

Pala Band of Mission Indians
Shasta Gaughen, Tribal Historic Preservation Officer
PMB 50, 35008 Pala Temecula Rd. Cupeno Luiseno
Pala, CA, 92059
Phone: (760) 891 - 3515
Fax: (760) 742-3189
sgaughen@palatribe.com

Pechanga Band of Indians
Mark Macarro, Chairperson
P.O. Box 1477 Luiseno
Temecula, CA, 92593
Phone: (951) 770 - 6000
Fax: (951) 695-1778
epreston@pechanga-nsn.gov

Rincon Band of Luiseno Indians
Cheryl Madrigal, Tribal Historic Preservation Officer
One Government Center Lane Luiseno
Valley Center, CA, 92082
Phone: (760) 297 - 2635
crd@rincon-nsn.gov

Rincon Band of Luiseno Indians
Bo Mazzetti, Chairperson
One Government Center Lane Luiseno
Valley Center, CA, 92082
Phone: (760) 749 - 1051
Fax: (760) 749-5144
bomazzetti@aol.com

This list is current only as of the date of this document. Distribution of this list does not relieve any person of statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resources Code and Section 6097.98 of the Public Resources Code and section 5097.98 of the Public Resources Code.

This list is only applicable for consultation with Native American tribes under Government Code Sections 65352.3 and 65352.4 et seq for the proposed General Plan Update Project, San Bernardino County.

Santa Rosa Band of Cahuilla Indians
Lovina Redner, Tribal Chair
P.O. Box 391820 Cahuilla
Anza, CA, 92539
Phone: (951) 659 - 2700
Fax: (951) 659-2228
lsaul@santarosa-nsn.gov

Soboba Band of Luiseno Indians
Isaiah Vivanco, Chairperson
P. O. Box 487 Cahuilla
San Jacinto, CA, 92581 Luiseno
Phone: (951) 654 - 5544
Fax: (951) 654-4198
ivivanco@soboba-nsn.gov

Soboba Band of Luiseno Indians
Joseph Ontiveros, Cultural Resource Department
P.O. BOX 487 Cahuilla
San Jacinto, CA, 92581 Luiseno
Phone: (951) 663 - 5279
Fax: (951) 654-4198
jontiveros@soboba-nsn.gov

This list is current only as of the date of this document. Distribution of this list does not relieve any person of statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resources Code and Section 6097.98 of the Public Resources Code and section 5097.98 of the Public Resources Code.

This list is only applicable for consultation with Native American tribes under Government Code Sections 65352.3 and 65352.4 et seq for the proposed General Plan Update Project, San Bernardino County.

City of Chino Hills

14000 City Center Drive
Chino Hills, CA 91709
(909) 364-2600
www.chinohills.org

September 13, 2022

Andrew Salas, Chairperson
Gabrieleno Band of Mission Indians - Kizh Nation
P.O. Box 393
Covina, CA, 91723

SUBJECT: SENATE BILL (SB) 18 CONSULTATION - CITYWIDE GENERAL PLAN UPDATE (22GPA01)

Dear Mr. Salas,

The City of Chino Hills is conducting a CEQA review for the above referenced Project, which includes a comprehensive General Plan Update for the entire City of Chino Hills. This letter is sent to inform you about the proposed project and to request your consultation pursuant to SB 18.

Because the proposed project includes a General Plan Land Use Map change, it must comply with California Public Resources Code § 65352.3 – 65352.4 (Senate Bill 18), which requires local governments to conduct meaningful consultation with California Native American tribes on the contact list maintained by the Native American Heritage Commission prior to the adoption or amendment of a city or county general plan for the purpose of protecting cultural places on lands affected by the proposal.

Your tribe's input is important to the City's planning process. We request that you advise us as early as possible if you wish to consult on the proposed project. Under SB 18, you have 90 days from the date of receipt of this notice to advise the City if you are interested in further consultation.

Attached is project location information and location maps. If you require any additional information or have any questions, please contact me at:

Michael Hofflinger, Planning Manager
Community Development Department
City of Chino Hills
14000 City Center Drive
Chino Hills, CA 91709
(909) 364-2777
mhofflinger@chinohills.org

City Council: Art Bennett ▪ Brian Johsz ▪ Ray Marquez ▪ Cynthia Moran ▪ Peter J. Rogers

Sincerely,
COMMUNITY DEVELOPMENT DEPARTMENT

Michael Hofflinger
Planning Manager

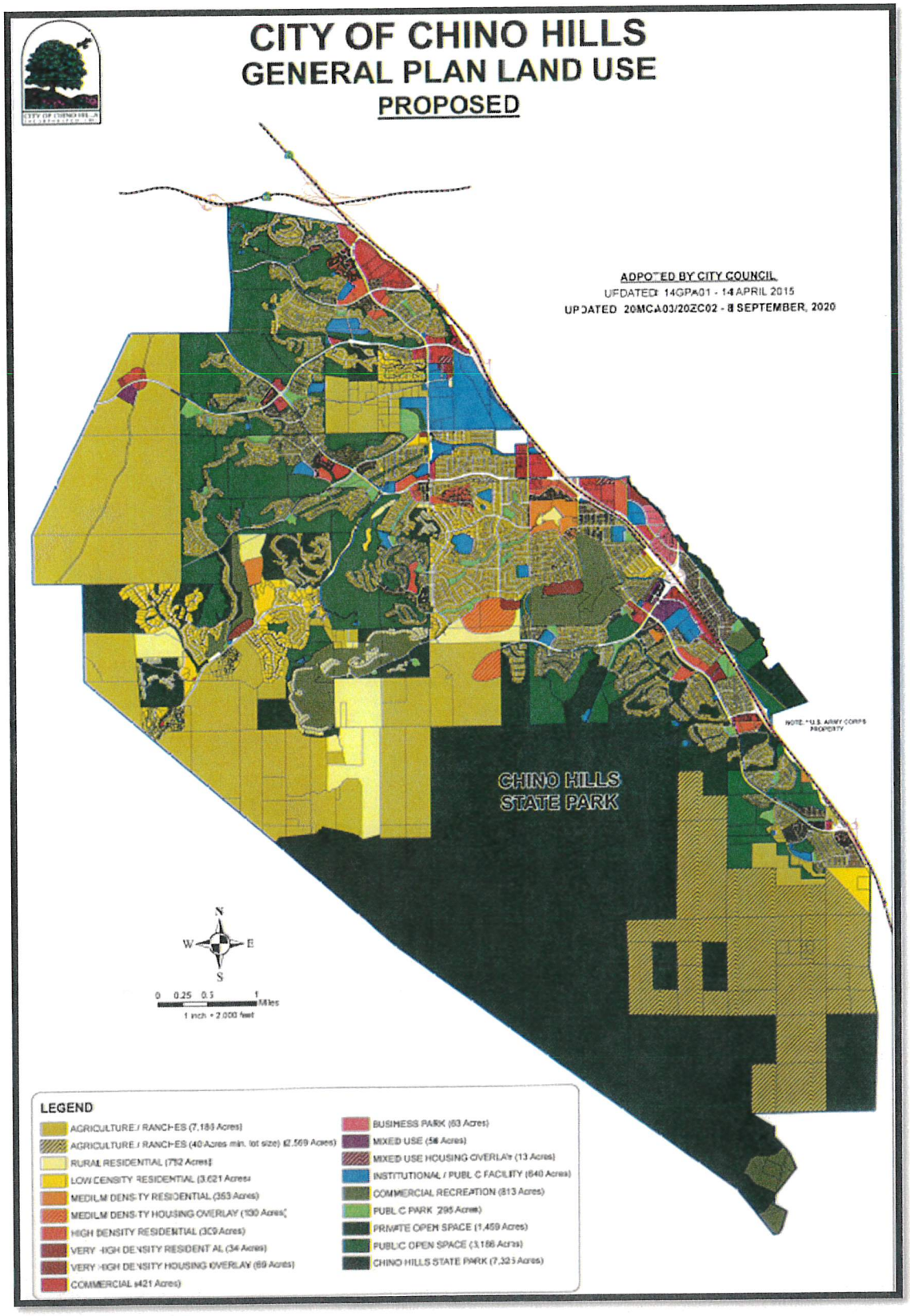
Enclosures:

Exhibit 1	City of Chino Hills Regional Location Map
Exhibit 2	City of Chino Hills Proposed General Plan Land Use Map

Exhibit 1


Bakersfield
Santa Barbara
CALIFORNIA
Chino Hills
Los Angeles
San Bernardino
Riverside
Santa Ana
San Diego
MEXICO
Chino Hills, CA
Copyright Sperling's BestPlaces

Exhibit 2


CITY OF CHINO HILLS
GENERAL PLAN LAND USE
PROPOSED
ADOPTED BY CITY COUNCIL
UPDATED 14GPA01 - 14 APRIL 2015
UPDATED 20MCA03/20ZC02 - 8 SEPTEMBER, 2020
CHINO HILLS STATE PARK
N
W
E
S
0 0.25 0.5 1 Miles
1 inch = 2,000 feet
LEGEND
AGRICULTURE / RANCHES (7,186 Acres)
AGRICULTURE / RANCHES (40 Acres min. lot size) (2,569 Acres)
RURAL RESIDENTIAL (752 Acres)
LOW DENSITY RESIDENTIAL (3,621 Acres)
MEDIUM DENSITY RESIDENTIAL (363 Acres)
MEDIUM DENSITY HOUSING OVERLAY (100 Acres)
HIGH DENSITY RESIDENTIAL (309 Acres)
VERY HIGH DENSITY RESIDENTIAL (34 Acres)
VERY HIGH DENSITY HOUSING OVERLAY (69 Acres)
COMMERCIAL (421 Acres)
BUSINESS PARK (63 Acres)
MIXED USE (58 Acres)
MIXED USE HOUSING OVERLAY (13 Acres)
INSTITUTIONAL / PUBLIC FACILITY (640 Acres)
COMMERCIAL RECREATION (813 Acres)
PUBLIC PARK (295 Acres)
PRIVATE OPEN SPACE (1,459 Acres)
PUBLIC OPEN SPACE (3,186 Acres)
CHINO HILLS STATE PARK (7,325 Acres)

GABRIELENO BAND OF MISSION INDIANS - KIZH NATION
Historically known as The San Gabriel Band of Mission Indians recognized by the State of California as the aboriginal tribe of the Los Angeles basin

September 19,2022

Project Name: Citywide General Plan Update, City of Chino Hills

Thank you for your letter dated September 13,2022. Regarding the project above. This is to concur that we agree with the General Plan. However, our Tribal government would like to request consultation for all future projects within this location.

Andrew Salas, Chairman
Gabrieleno Band of Mission Indians – Kizh Nation

Andrew Salas, Chairman | Nadine Salas, Vice-Chairman | Dr. Christina Swindall Martinez, secretary
Albert Perez, treasurer I | Martha Gonzalez Lemos, treasurer II | Richard Gradias, Chairman of the council of Elders

PO Box 393 Covina, CA 91723 www.gabrielenoindians@yahoo.com gabrielenoindians@yahoo.com

City of Chino Hills

14000 City Center Drive
Chino Hills, CA 91709
(909) 364-2600
www.chinohills.org

September 13, 2022

Sandonne Goad, Chairperson
Gabrielino /Tongva Nation
106 1/2 Judge John Aiso St, #231
Los Angeles, CA, 90012

SUBJECT: SENATE BILL (SB) 18 CONSULTATION - CITYWIDE GENERAL PLAN UPDATE (22GPA01)

Dear Mr. Goad,

The City of Chino Hills is conducting a CEQA review for the above referenced Project, which includes a comprehensive General Plan Update for the entire City of Chino Hills. This letter is sent to inform you about the proposed project and to request your consultation pursuant to SB 18.

Because the proposed project includes a General Plan Land Use Map change, it must comply with California Public Resources Code § 65352.3 – 65352.4 (Senate Bill 18), which requires local governments to conduct meaningful consultation with California Native American tribes on the contact list maintained by the Native American Heritage Commission prior to the adoption or amendment of a city or county general plan for the purpose of protecting cultural places on lands affected by the proposal.

Your tribe's input is important to the City's planning process. We request that you advise us as early as possible if you wish to consult on the proposed project. Under SB 18, you have 90 days from the date of receipt of this notice to advise the City if you are interested in further consultation.

Attached is project location information and location maps. If you require any additional information or have any questions, please contact me at:

Michael Hofflinger, Planning Manager
Community Development Department
City of Chino Hills
14000 City Center Drive
Chino Hills, CA 91709
(909) 364-2777
mhofflinger@chinohills.org

City Council: Art Bennett ▪ Brian Johsz ▪ Ray Marquez ▪ Cynthia Moran ▪ Peter J. Rogers

Sincerely,
COMMUNITY DEVELOPMENT DEPARTMENT



Michael Hofflinger
Planning Manager

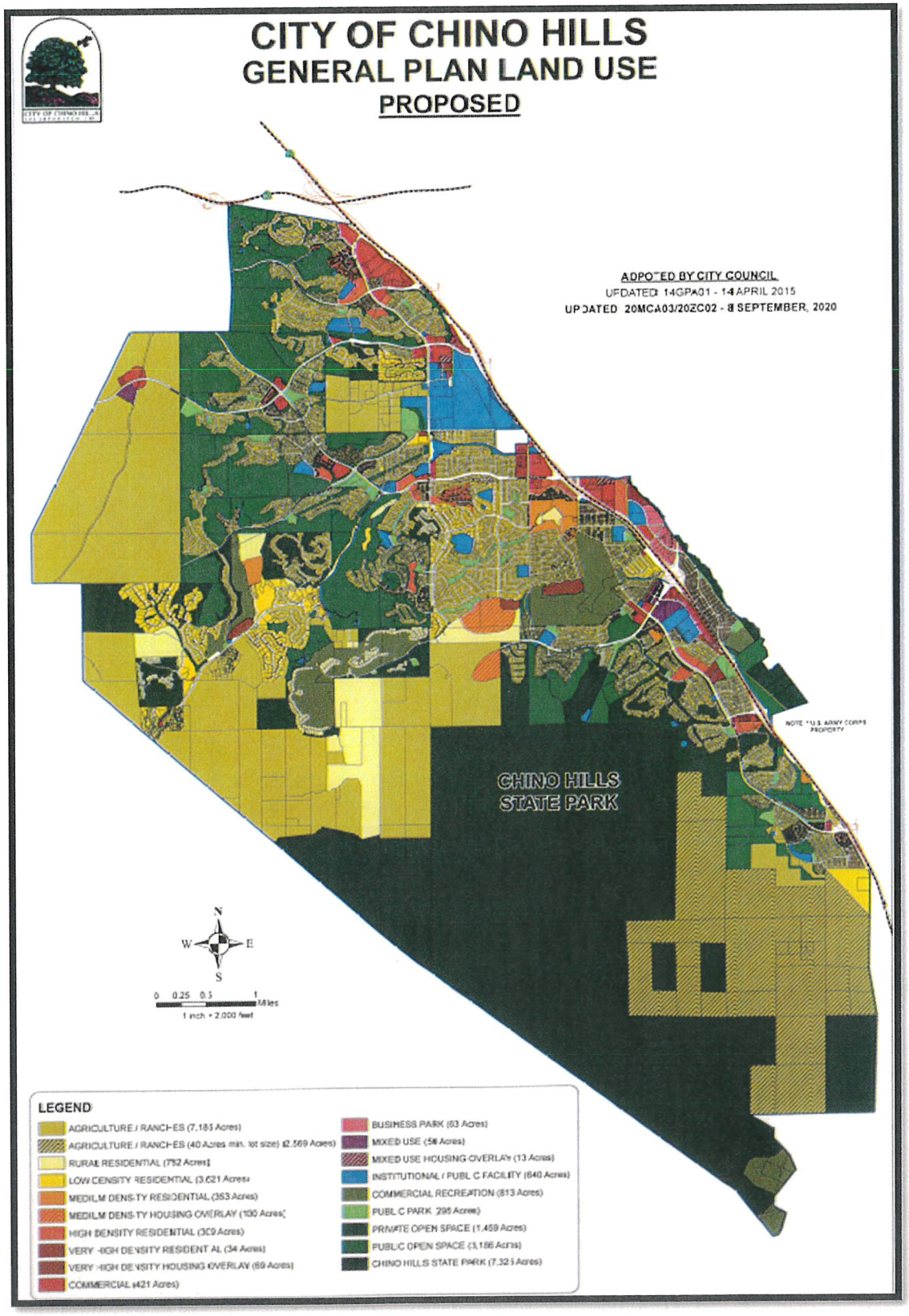
Enclosures:

Exhibit 1	City of Chino Hills Regional Location Map
Exhibit 2	City of Chino Hills Proposed General Plan Land Use Map

Exhibit 1


Bakersfield
Santa Barbara
CALIFORNIA
Chino Hills
Los Angeles
San Bernardino
Riverside
Santa Ana
San Diego
MEXICO
Chino Hills, CA
Copyright Sperling's BestPlaces

Exhibit 2


CITY OF CHINO HILLS
GENERAL PLAN LAND USE
PROPOSED
ADOPTED BY CITY COUNCIL
UPDATED 14GPA01 - 14 APRIL 2015
UPDATED 20MCA03/20ZC02 - 8 SEPTEMBER, 2020
NOTE * U.S. ARMY CORPS PROPERTY
CHINO HILLS STATE PARK
N
W
E
S
0 0.25 0.5 1 Miles
1 inch = 2,000 feet
LEGEND
AGRICULTURE / RANCHES (7,183 Acres)
AGRICULTURE / RANCHES (40 Acres min. lot size) (2,569 Acres)
RURAL RESIDENTIAL (752 Acres)
LOW DENSITY RESIDENTIAL (3,621 Acres)
MEDIUM DENSITY RESIDENTIAL (353 Acres)
MEDIUM DENSITY HOUSING OVERLAY (100 Acres)
HIGH DENSITY RESIDENTIAL (309 Acres)
VERY HIGH DENSITY RESIDENTIAL (34 Acres)
VERY HIGH DENSITY HOUSING OVERLAY (69 Acres)
COMMERCIAL (421 Acres)
BUSINESS PARK (63 Acres)
MIXED USE (58 Acres)
MIXED USE HOUSING OVERLAY (13 Acres)
INSTITUTIONAL / PUBLIC FACILITY (640 Acres)
COMMERCIAL RECREATION (813 Acres)
PUBLIC PARK (295 Acres)
PRIVATE OPEN SPACE (1,459 Acres)
PUBLIC OPEN SPACE (3,186 Acres)
CHINO HILLS STATE PARK (7,325 Acres)

City of Chino Hills

14000 City Center Drive
Chino Hills, CA 91709
(909) 364-2600
www.chinohills.org

September 13, 2022

Christina Conley, Tribal Consultant and Administrator
Gabrielino Tongva Indians of California Tribal Council
P.O. Box 941078
Simi Valley, CA 93094

SUBJECT: SENATE BILL (SB) 18 CONSULTATION - CITYWIDE GENERAL PLAN UPDATE (22GPA01)

Dear Ms. Conley,

The City of Chino Hills is conducting a CEQA review for the above referenced Project, which includes a comprehensive General Plan Update for the entire City of Chino Hills. This letter is sent to inform you about the proposed project and to request your consultation pursuant to SB 18.

Because the proposed project includes a General Plan Land Use Map change, it must comply with California Public Resources Code § 65352.3 – 65352.4 (Senate Bill 18), which requires local governments to conduct meaningful consultation with California Native American tribes on the contact list maintained by the Native American Heritage Commission prior to the adoption or amendment of a city or county general plan for the purpose of protecting cultural places on lands affected by the proposal.

Your tribe's input is important to the City's planning process. We request that you advise us as early as possible if you wish to consult on the proposed project. Under SB 18, you have 90 days from the date of receipt of this notice to advise the City if you are interested in further consultation.

Attached is project location information and location maps. If you require any additional information or have any questions, please contact me at:

Michael Hofflinger, Planning Manager
Community Development Department
City of Chino Hills
14000 City Center Drive
Chino Hills, CA 91709
(909) 364-2777
mhofflinger@chinohills.org

City Council: Art Bennett ▪ Brian Johsz ▪ Ray Marquez ▪ Cynthia Moran ▪ Peter J. Rogers

Sincerely,
COMMUNITY DEVELOPMENT DEPARTMENT

Michael Hofflinger
Planning Manager

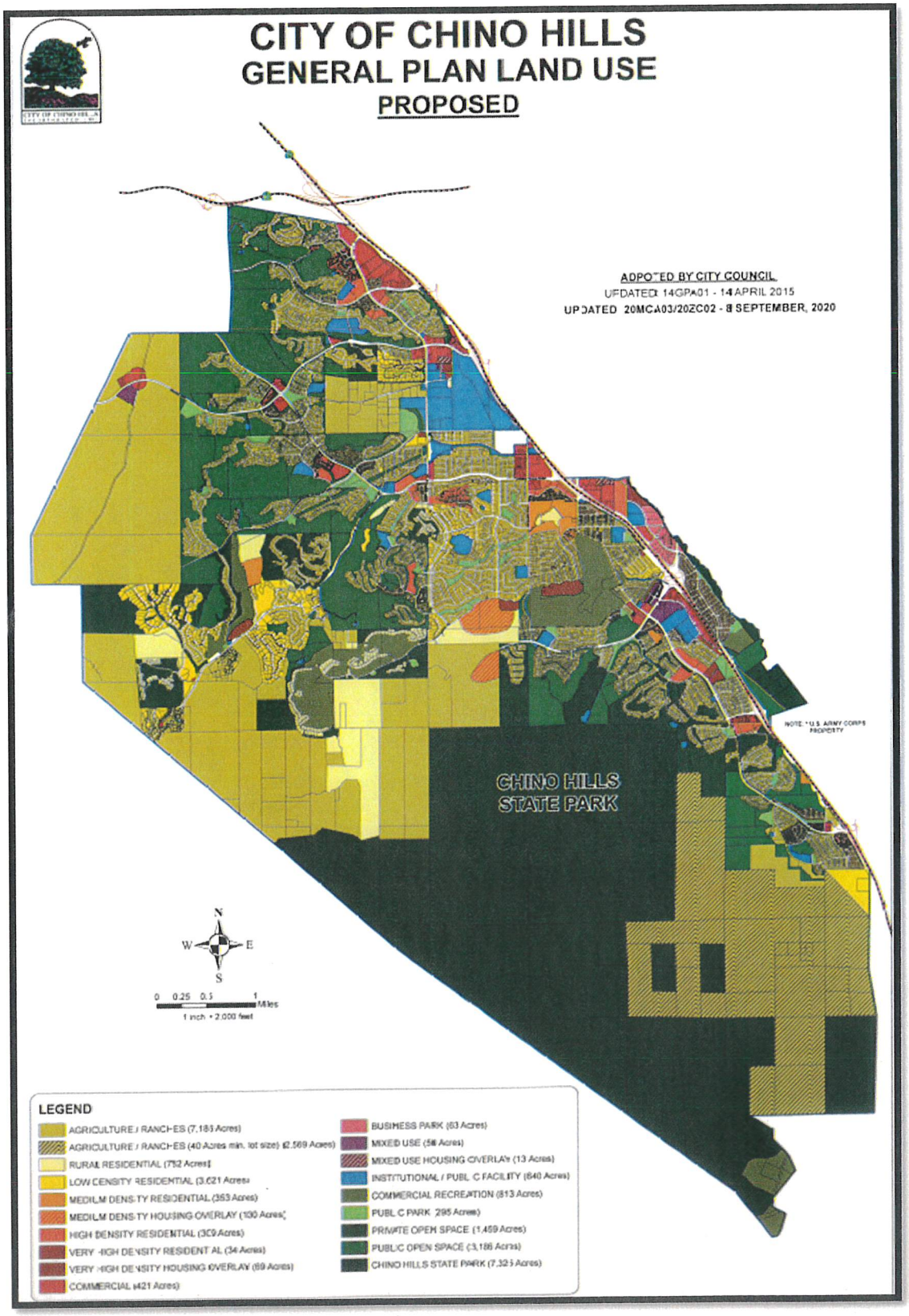
Enclosures:

Exhibit 1	City of Chino Hills Regional Location Map
Exhibit 2	City of Chino Hills Proposed General Plan Land Use Map

Exhibit 1


Bakersfield
Santa Barbara
Chino Hills
Los Angeles
San Bernardino
Riverside
Santa Ana
San Diego
MEXICO
Chino Hills, CA
Copyright Sperling's BestPlaces

Exhibit 2


CITY OF CHINO HILLS
GENERAL PLAN LAND USE
PROPOSED
ADOPTED BY CITY COUNCIL
UPDATED 14GPA01 - 14 APRIL 2015
UPDATED 20MCA03/20ZC02 - 8 SEPTEMBER, 2020
NOTE: *U.S. ARMY CORPS PROPERTY
CHINO HILLS STATE PARK
N
W
E
S
0 0.25 0.5 1 Miles
1 inch = 2,000 feet
LEGEND
AGRICULTURE / RANCHES (7,183 Acres)
AGRICULTURE / RANCHES (40 Acres min. lot size) (2,569 Acres)
RURAL RESIDENTIAL (752 Acres)
LOW DENSITY RESIDENTIAL (3,621 Acres)
MEDIUM DENSITY RESIDENTIAL (353 Acres)
MEDIUM DENSITY HOUSING OVERLAY (100 Acres)
HIGH DENSITY RESIDENTIAL (309 Acres)
VERY HIGH DENSITY RESIDENTIAL (34 Acres)
VERY HIGH DENSITY HOUSING OVERLAY (69 Acres)
COMMERCIAL (421 Acres)
BUSINESS PARK (63 Acres)
MIXED USE (58 Acres)
MIXED USE HOUSING OVERLAY (13 Acres)
INSTITUTIONAL / PUBLIC FACILITY (640 Acres)
COMMERCIAL RECREATION (813 Acres)
PUBLIC PARK (295 Acres)
PRIVATE OPEN SPACE (1,459 Acres)
PUBLIC OPEN SPACE (3,186 Acres)
CHINO HILLS STATE PARK (7,323 Acres)

City of Chino Hills

14000 City Center Drive
Chino Hills, CA 91709
(909) 364-2600
www.chinohills.org

September 13, 2022

Robert Dorame, Chairperson
Gabrielino Tongva Indians of California Tribal Council
P.O. Box 490
Bellflower, CA, 90707

SUBJECT: SENATE BILL (SB) 18 CONSULTATION - CITYWIDE GENERAL PLAN UPDATE (22GPA01)

Dear Mr. Dorame,

The City of Chino Hills is conducting a CEQA review for the above referenced Project, which includes a comprehensive General Plan Update for the entire City of Chino Hills. This letter is sent to inform you about the proposed project and to request your consultation pursuant to SB 18.

Because the proposed project includes a General Plan Land Use Map change, it must comply with California Public Resources Code § 65352.3 – 65352.4 (Senate Bill 18), which requires local governments to conduct meaningful consultation with California Native American tribes on the contact list maintained by the Native American Heritage Commission prior to the adoption or amendment of a city or county general plan for the purpose of protecting cultural places on lands affected by the proposal.

Your tribe's input is important to the City's planning process. We request that you advise us as early as possible if you wish to consult on the proposed project. Under SB 18, you have 90 days from the date of receipt of this notice to advise the City if you are interested in further consultation.

Attached is project location information and location maps. If you require any additional information or have any questions, please contact me at:

Michael Hofflinger, Planning Manager
Community Development Department
City of Chino Hills
14000 City Center Drive
Chino Hills, CA 91709
(909) 364-2777
mhofflinger@chinohills.org

City Council: Art Bennett ▪ Brian Johsz ▪ Ray Marquez ▪ Cynthia Moran ▪ Peter J. Rogers

Sincerely,
COMMUNITY DEVELOPMENT DEPARTMENT



Michael Hofflinger
Planning Manager

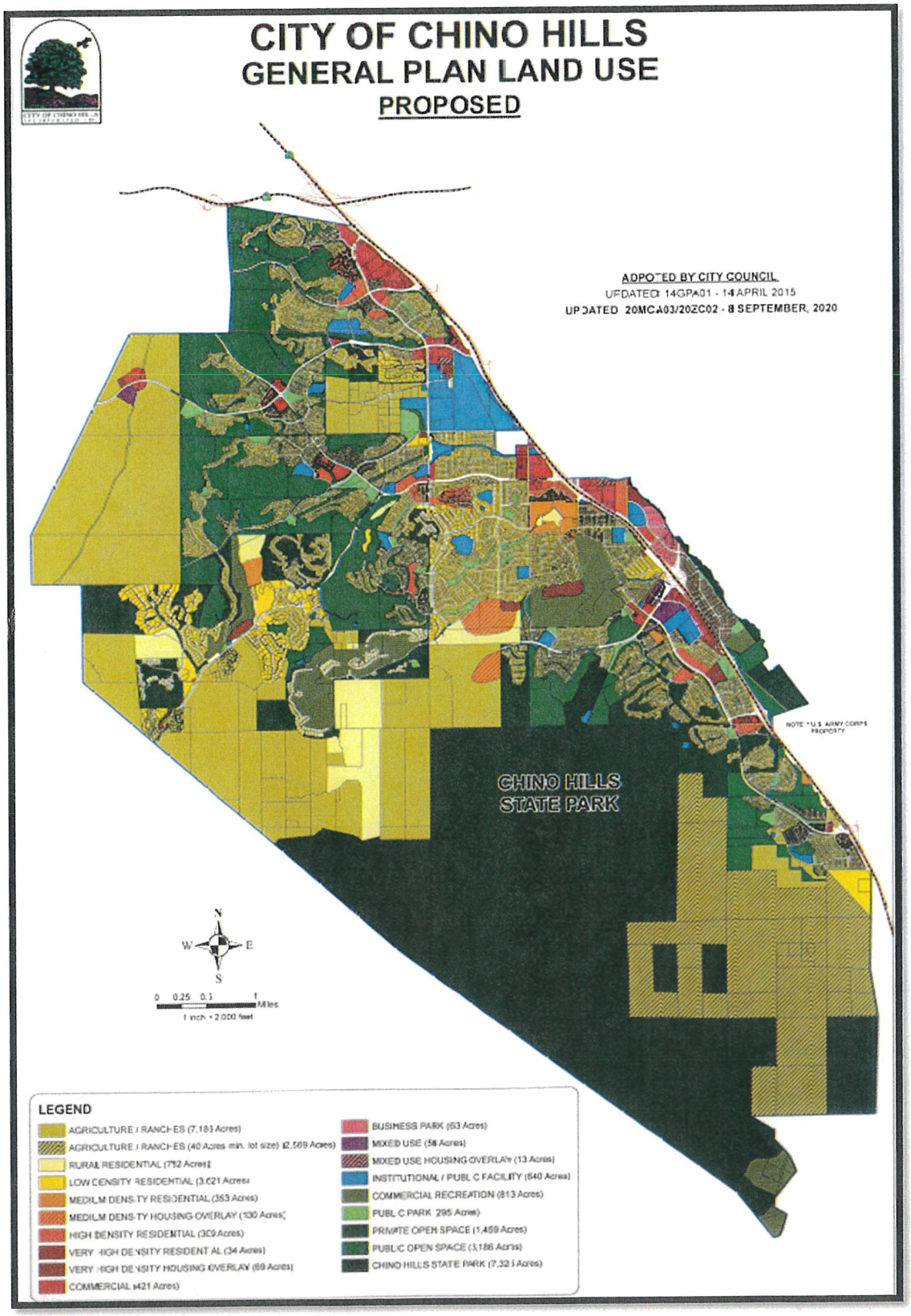
Enclosures:

Exhibit 1	City of Chino Hills Regional Location Map
Exhibit 2	City of Chino Hills Proposed General Plan Land Use Map

Exhibit 1


Bakersfield
Santa Barbara
Chino Hills
Los Angeles
San Bernardino
Riverside
Santa Ana
San Diego
MEXICO
Chino Hills, CA
Copyright Sperling's BestPlaces

Exhibit 2


CITY OF CHINO HILLS
GENERAL PLAN LAND USE
PROPOSED
ADOPTED BY CITY COUNCIL
UPDATED 14GPA01 - 14 APRIL 2015
UPDATED 20MCA03/20ZC02 - 8 SEPTEMBER, 2020
CHINO HILLS STATE PARK
N
W
E
S
0 0.25 0.5 1 Miles
1 inch = 2,000 feet
LEGEND
AGRICULTURE / RANCHES (7,183 Acres)
AGRICULTURE / RANCHES (40 Acres min. lot size) (2,569 Acres)
RURAL RESIDENTIAL (752 Acres)
LOW DENSITY RESIDENTIAL (3,621 Acres)
MEDIUM DENSITY RESIDENTIAL (353 Acres)
MEDIUM DENSITY HOUSING OVERLAY (100 Acres)
HIGH DENSITY RESIDENTIAL (309 Acres)
VERY HIGH DENSITY RESIDENTIAL (34 Acres)
VERY HIGH DENSITY HOUSING OVERLAY (69 Acres)
COMMERCIAL (421 Acres)
BUSINESS PARK (63 Acres)
MIXED USE (58 Acres)
MIXED USE HOUSING OVERLAY (13 Acres)
INSTITUTIONAL / PUBLIC FACILITY (640 Acres)
COMMERCIAL RECREATION (813 Acres)
PUBLIC PARK (295 Acres)
PRIVATE OPEN SPACE (1,459 Acres)
PUBLIC OPEN SPACE (3,186 Acres)
CHINO HILLS STATE PARK (7,325 Acres)

City of Chino Hills

14000 City Center Drive
Chino Hills, CA 91709
(909) 364-2600
www.chinohills.org

September 13, 2022

Charles Alvarez
Gabrielino-Tongva Tribe
23454 Vanowen Street
West Hills, CA, 91307

SUBJECT: SENATE BILL (SB) 18 CONSULTATION - CITYWIDE GENERAL PLAN UPDATE (22GPA01)

Dear Mr. Alvarez,

The City of Chino Hills is conducting a CEQA review for the above referenced Project, which includes a comprehensive General Plan Update for the entire City of Chino Hills. This letter is sent to inform you about the proposed project and to request your consultation pursuant to SB 18.

Because the proposed project includes a General Plan Land Use Map change, it must comply with California Public Resources Code § 65352.3 – 65352.4 (Senate Bill 18), which requires local governments to conduct meaningful consultation with California Native American tribes on the contact list maintained by the Native American Heritage Commission prior to the adoption or amendment of a city or county general plan for the purpose of protecting cultural places on lands affected by the proposal.

Your tribe's input is important to the City's planning process. We request that you advise us as early as possible if you wish to consult on the proposed project. Under SB 18, you have 90 days from the date of receipt of this notice to advise the City if you are interested in further consultation.

Attached is project location information and location maps. If you require any additional information or have any questions, please contact me at:

Michael Hofflinger, Planning Manager
Community Development Department
City of Chino Hills
14000 City Center Drive
Chino Hills, CA 91709
(909) 364-2777
mhofflinger@chinohills.org

City Council: Art Bennett ▪ Brian Johsz ▪ Ray Marquez ▪ Cynthia Moran ▪ Peter J. Rogers

Sincerely,
COMMUNITY DEVELOPMENT DEPARTMENT



Michael Hofflinger
Planning Manager

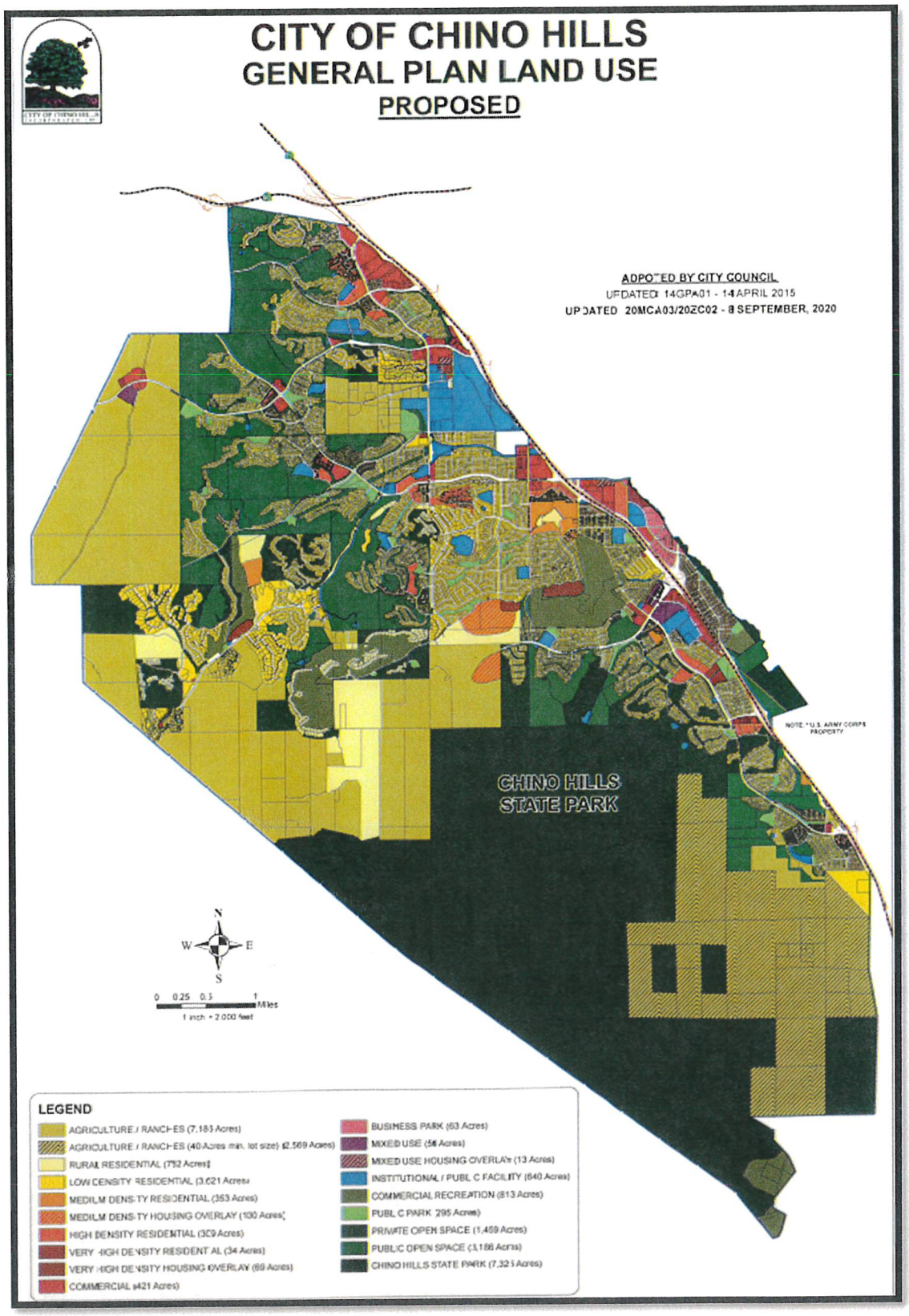
Enclosures:

Exhibit 1	City of Chino Hills Regional Location Map
Exhibit 2	City of Chino Hills Proposed General Plan Land Use Map

Exhibit 1


Bakersfield
Santa Barbara
Chino Hills
Los Angeles
San Bernardino
Riverside
Santa Ana
San Diego
MEXICO
Chino Hills, CA
Copyright Sperling's BestPlaces

Exhibit 2


CITY OF CHINO HILLS
GENERAL PLAN LAND USE
PROPOSED
ADOPTED BY CITY COUNCIL
UPDATED 14GPA01 - 14 APRIL 2015
UPDATED 20MCA03/20ZC02 - 8 SEPTEMBER, 2020
CHINO HILLS STATE PARK
N
W
E
S
0 0.25 0.5 1 Miles
1 inch = 2,000 feet
LEGEND
AGRICULTURE / RANCHES (7,183 Acres)
AGRICULTURE / RANCHES (40 Acres min. lot size) (2,569 Acres)
RURAL RESIDENTIAL (752 Acres)
LOW DENSITY RESIDENTIAL (3,621 Acres)
MEDIUM DENSITY RESIDENTIAL (353 Acres)
MEDIUM DENSITY HOUSING OVERLAY (100 Acres)
HIGH DENSITY RESIDENTIAL (359 Acres)
VERY HIGH DENSITY RESIDENTIAL (34 Acres)
VERY HIGH DENSITY HOUSING OVERLAY (69 Acres)
COMMERCIAL (421 Acres)
BUSINESS PARK (63 Acres)
MIXED USE (58 Acres)
MIXED USE HOUSING OVERLAY (13 Acres)
INSTITUTIONAL / PUBLIC FACILITY (640 Acres)
COMMERCIAL RECREATION (813 Acres)
PUBLIC PARK (295 Acres)
PRIVATE OPEN SPACE (1,459 Acres)
PUBLIC OPEN SPACE (3,186 Acres)
CHINO HILLS STATE PARK (7,325 Acres)

City of Chino Hills

14000 City Center Drive
Chino Hills, CA 91709
(909) 364-2600
www.chinohills.org

September 13, 2022

Matias Belardes, Chairperson
Juaneno Band of Mission Indians Acjachemen Nation
32161 Avenida Los Amigos
San Juan Capistrano, CA 92675

SUBJECT: SENATE BILL (SB) 18 CONSULTATION - CITYWIDE GENERAL PLAN UPDATE (22GPA01)

Dear Mr. Belardes,

The City of Chino Hills is conducting a CEQA review for the above referenced Project, which includes a comprehensive General Plan Update for the entire City of Chino Hills. This letter is sent to inform you about the proposed project and to request your consultation pursuant to SB 18.

Because the proposed project includes a General Plan Land Use Map change, it must comply with California Public Resources Code § 65352.3 – 65352.4 (Senate Bill 18), which requires local governments to conduct meaningful consultation with California Native American tribes on the contact list maintained by the Native American Heritage Commission prior to the adoption or amendment of a city or county general plan for the purpose of protecting cultural places on lands affected by the proposal.

Your tribe's input is important to the City's planning process. We request that you advise us as early as possible if you wish to consult on the proposed project. Under SB 18, you have 90 days from the date of receipt of this notice to advise the City if you are interested in further consultation.

Attached is project location information and location maps. If you require any additional information or have any questions, please contact me at:

Michael Hofflinger, Planning Manager
Community Development Department
City of Chino Hills
14000 City Center Drive
Chino Hills, CA 91709
(909) 364-2777
mhofflinger@chinohills.org

City Council: Art Bennett ▪ Brian Johsz ▪ Ray Marquez ▪ Cynthia Moran ▪ Peter J. Rogers

Sincerely,
COMMUNITY DEVELOPMENT DEPARTMENT

Michael Hofflinger
Planning Manager

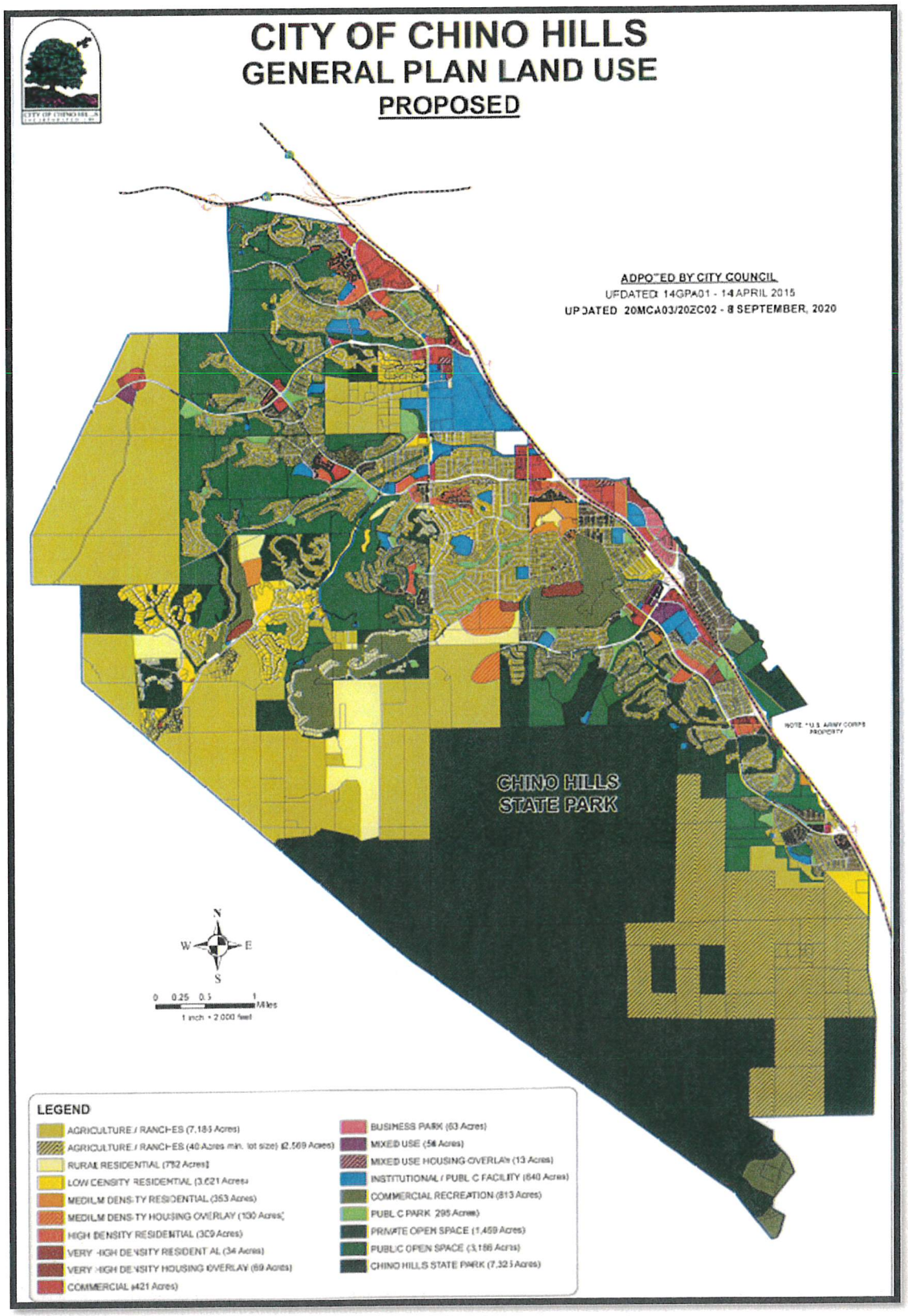
Enclosures:

Exhibit 1	City of Chino Hills Regional Location Map
Exhibit 2	City of Chino Hills Proposed General Plan Land Use Map

Exhibit 1


Bakersfield
Santa Barbara
Chino Hills
Los Angeles
San Bernardino
Riverside
Santa Ana
San Diego
MEXICO
Chino Hills, CA
Copyright Sperling's BestPlaces

Exhibit 2


CITY OF CHINO HILLS
GENERAL PLAN LAND USE
PROPOSED
ADOPTED BY CITY COUNCIL
UPDATED 14GPA01 - 14 APRIL 2015
UPDATED 20MCA03/20ZC02 - 8 SEPTEMBER, 2020
CHINO HILLS STATE PARK
N
W
E
S
0 0.25 0.5 1 Miles
1 inch = 2,000 feet
LEGEND
AGRICULTURE / RANCHES (7,183 Acres)
AGRICULTURE / RANCHES (40 Acres min. lot size) (2,569 Acres)
RURAL RESIDENTIAL (752 Acres)
LOW DENSITY RESIDENTIAL (3,621 Acres)
MEDIUM DENSITY RESIDENTIAL (353 Acres)
MEDIUM DENSITY HOUSING OVERLAY (100 Acres)
HIGH DENSITY RESIDENTIAL (309 Acres)
VERY HIGH DENSITY RESIDENTIAL (34 Acres)
VERY HIGH DENSITY HOUSING OVERLAY (69 Acres)
COMMERCIAL (421 Acres)
BUSINESS PARK (63 Acres)
MIXED USE (58 Acres)
MIXED USE HOUSING OVERLAY (13 Acres)
INSTITUTIONAL / PUBLIC FACILITY (640 Acres)
COMMERCIAL RECREATION (813 Acres)
PUBLIC PARK (295 Acres)
PRIVATE OPEN SPACE (1,459 Acres)
PUBLIC OPEN SPACE (3,186 Acres)
CHINO HILLS STATE PARK (7,323 Acres)

City of Chino Hills

14000 City Center Drive
Chino Hills, CA 91709
(909) 364-2600
www.chinohills.org

September 13, 2022

Heidi Lucero, Chairperson
Juaneno Band of Mission Indians Acjachemen Nation 84A
31411-A La Matanza Street
San Juan Capistrano, CA, 92675

SUBJECT: SENATE BILL (SB) 18 CONSULTATION - CITYWIDE GENERAL PLAN UPDATE (22GPA01)

Dear Ms. Lucero,

The City of Chino Hills is conducting a CEQA review for the above referenced Project, which includes a comprehensive General Plan Update for the entire City of Chino Hills. This letter is sent to inform you about the proposed project and to request your consultation pursuant to SB 18.

Because the proposed project includes a General Plan Land Use Map change, it must comply with California Public Resources Code § 65352.3 – 65352.4 (Senate Bill 18), which requires local governments to conduct meaningful consultation with California Native American tribes on the contact list maintained by the Native American Heritage Commission prior to the adoption or amendment of a city or county general plan for the purpose of protecting cultural places on lands affected by the proposal.

Your tribe's input is important to the City's planning process. We request that you advise us as early as possible if you wish to consult on the proposed project. Under SB 18, you have 90 days from the date of receipt of this notice to advise the City if you are interested in further consultation.

Attached is project location information and location maps. If you require any additional information or have any questions, please contact me at:

Michael Hofflinger, Planning Manager
Community Development Department
City of Chino Hills
14000 City Center Drive
Chino Hills, CA 91709
(909) 364-2777
mhofflinger@chinohills.org

City Council: Art Bennett ▪ Brian Johsz ▪ Ray Marquez ▪ Cynthia Moran ▪ Peter J. Rogers

Sincerely,
COMMUNITY DEVELOPMENT DEPARTMENT



Michael Hofflinger
Planning Manager

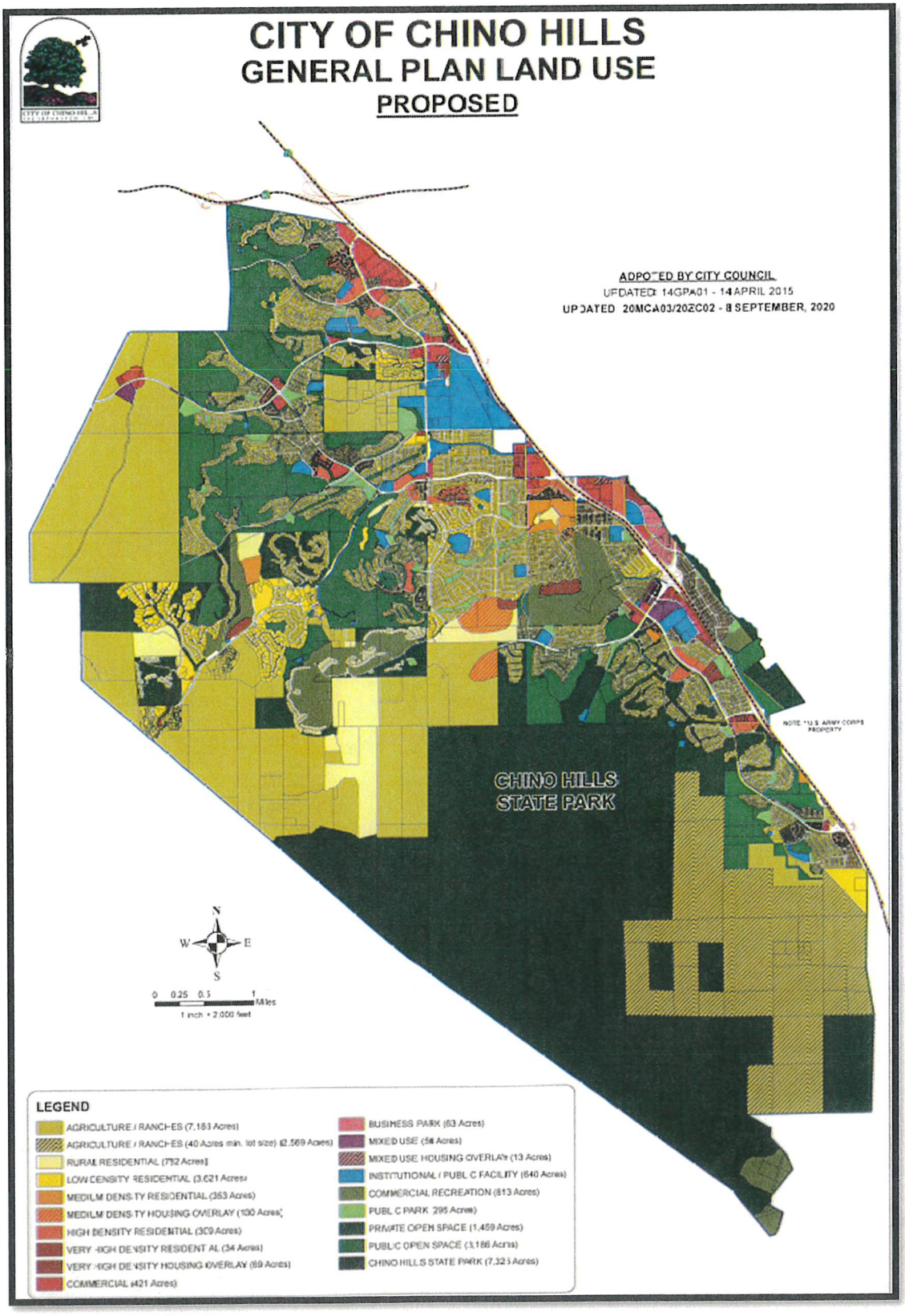
Enclosures:

Exhibit 1	City of Chino Hills Regional Location Map
Exhibit 2	City of Chino Hills Proposed General Plan Land Use Map

Exhibit 1


Bakersfield
Santa Barbara
CALIFORNIA
Chino Hills
Los Angeles
San Bernardino
Riverside
Santa Ana
San Diego
MEXICO
Chino Hills, CA
Copyright Sperling's BestPlaces

Exhibit 2


CITY OF CHINO HILLS
GENERAL PLAN LAND USE
PROPOSED
ADOPTED BY CITY COUNCIL
UPDATED 14GPA01 - 14 APRIL 2015
UPDATED 20MCA03/20ZC02 - 8 SEPTEMBER, 2020
NOTE: *U.S. ARMY CORPS PROPERTY
CHINO HILLS STATE PARK
N
W
E
S
0 0.25 0.5 1 Miles
1 inch = 2,000 feet
LEGEND
AGRICULTURE / RANCHES (7,183 Acres)
AGRICULTURE / RANCHES (40 Acres min. lot size) (2,569 Acres)
RURAL RESIDENTIAL (752 Acres)
LOW DENSITY RESIDENTIAL (3,621 Acres)
MEDIUM DENSITY RESIDENTIAL (353 Acres)
MEDIUM DENSITY HOUSING OVERLAY (100 Acres)
HIGH DENSITY RESIDENTIAL (309 Acres)
VERY HIGH DENSITY RESIDENTIAL (34 Acres)
VERY HIGH DENSITY HOUSING OVERLAY (69 Acres)
COMMERCIAL (421 Acres)
BUSINESS PARK (63 Acres)
MIXED USE (58 Acres)
MIXED USE HOUSING OVERLAY (13 Acres)
INSTITUTIONAL / PUBLIC FACILITY (640 Acres)
COMMERCIAL RECREATION (813 Acres)
PUBLIC PARK (295 Acres)
PRIVATE OPEN SPACE (1,459 Acres)
PUBLIC OPEN SPACE (3,186 Acres)
CHINO HILLS STATE PARK (7,323 Acres)

City of Chino Hills

14000 City Center Drive
Chino Hills, CA 91709
(909) 364-2600
www.chinohills.org

September 13, 2022

Shasta Gaughen, Tribal Historic Preservation Officer
Pala Band of Mission Indians
PMB 50, 35008 Pala Temecula Rd.
Pala, CA 92059

SUBJECT: SENATE BILL (SB) 18 CONSULTATION - CITYWIDE GENERAL PLAN UPDATE (22GPA01)

Dear Ms. Gaughen,

The City of Chino Hills is conducting a CEQA review for the above referenced Project, which includes a comprehensive General Plan Update for the entire City of Chino Hills. This letter is sent to inform you about the proposed project and to request your consultation pursuant to SB 18.

Because the proposed project includes a General Plan Land Use Map change, it must comply with California Public Resources Code § 65352.3 – 65352.4 (Senate Bill 18), which requires local governments to conduct meaningful consultation with California Native American tribes on the contact list maintained by the Native American Heritage Commission prior to the adoption or amendment of a city or county general plan for the purpose of protecting cultural places on lands affected by the proposal.

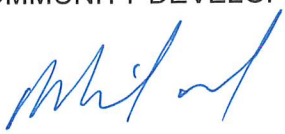
Your tribe's input is important to the City's planning process. We request that you advise us as early as possible if you wish to consult on the proposed project. Under SB 18, you have 90 days from the date of receipt of this notice to advise the City if you are interested in further consultation.

Attached is project location information and location maps. If you require any additional information or have any questions, please contact me at:

Michael Hofflinger, Planning Manager
Community Development Department
City of Chino Hills
14000 City Center Drive
Chino Hills, CA 91709
(909) 364-2777
mhofflinger@chinohills.org

City Council: Art Bennett ▪ Brian Johsz ▪ Ray Marquez ▪ Cynthia Moran ▪ Peter J. Rogers

Sincerely,
COMMUNITY DEVELOPMENT DEPARTMENT



Michael Hofflinger
Planning Manager

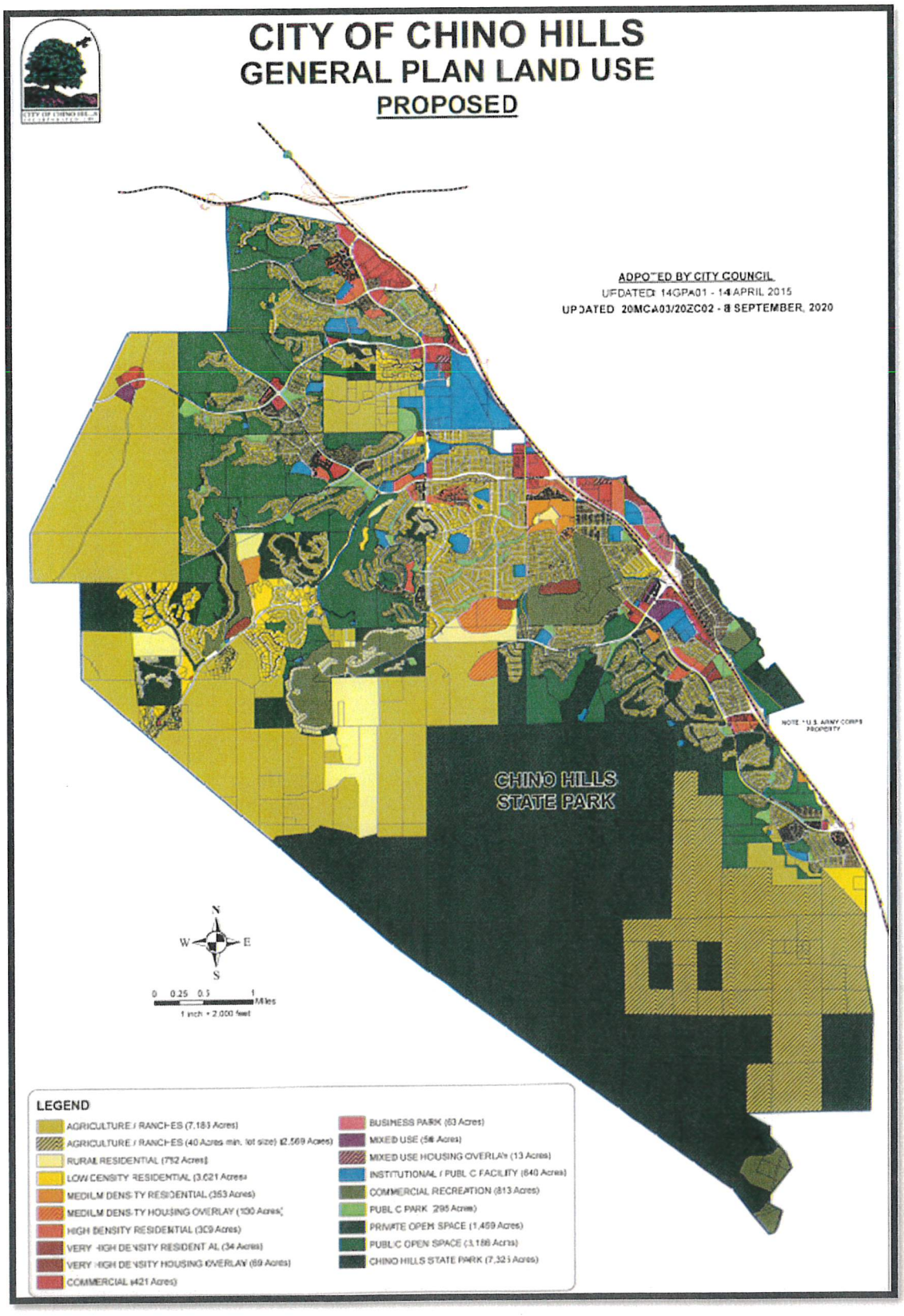
Enclosures:

Exhibit 1	City of Chino Hills Regional Location Map
Exhibit 2	City of Chino Hills Proposed General Plan Land Use Map

Exhibit 1


Bakersfield
Santa Barbara
Chino Hills
Los Angeles
San Bernardino
Riverside
Santa Ana
San Diego
MEXICO
Chino Hills, CA
Copyright Sperling's BestPlaces

Exhibit 2


CITY OF CHINO HILLS
GENERAL PLAN LAND USE
PROPOSED
ADOPTED BY CITY COUNCIL
UPDATED 14GPA01 - 14 APRIL 2015
UPDATED 20MCA03/20ZC02 - 8 SEPTEMBER, 2020
NOTE * U.S. ARMY CORPS PROPERTY
CHINO HILLS STATE PARK
N
W
E
S
0 0.25 0.5 1 Miles
1 inch = 2,000 feet
LEGEND
AGRICULTURE / RANCHES (7,183 Acres)
AGRICULTURE / RANCHES (40 Acres min. lot size) (2,569 Acres)
RURAL RESIDENTIAL (752 Acres)
LOW DENSITY RESIDENTIAL (3,021 Acres)
MEDIUM DENSITY RESIDENTIAL (353 Acres)
MEDIUM DENSITY HOUSING OVERLAY (100 Acres)
HIGH DENSITY RESIDENTIAL (309 Acres)
VERY HIGH DENSITY RESIDENTIAL (34 Acres)
VERY HIGH DENSITY HOUSING OVERLAY (69 Acres)
COMMERCIAL (421 Acres)
BUSINESS PARK (63 Acres)
MIXED USE (58 Acres)
MIXED USE HOUSING OVERLAY (13 Acres)
INSTITUTIONAL / PUBLIC FACILITY (640 Acres)
COMMERCIAL RECREATION (813 Acres)
PUBLIC PARK (295 Acres)
PRIVATE OPEN SPACE (1,459 Acres)
PUBLIC OPEN SPACE (3,186 Acres)
CHINO HILLS STATE PARK (7,323 Acres)

City of Chino Hills

14000 City Center Drive
Chino Hills, CA 91709
(909) 364-2600
www.chinohills.org

September 13, 2022

Cheryl Madrigal, Tribal Historic Preservation Officer
Rincon Band of Luiseno Indians
One Government Center Lane
Valley Center, CA 92082

SUBJECT: SENATE BILL (SB) 18 CONSULTATION - CITYWIDE GENERAL PLAN UPDATE (22GPA01)

Dear Ms. Madrigal,

The City of Chino Hills is conducting a CEQA review for the above referenced Project, which includes a comprehensive General Plan Update for the entire City of Chino Hills. This letter is sent to inform you about the proposed project and to request your consultation pursuant to SB 18.

Because the proposed project includes a General Plan Land Use Map change, it must comply with California Public Resources Code § 65352.3 – 65352.4 (Senate Bill 18), which requires local governments to conduct meaningful consultation with California Native American tribes on the contact list maintained by the Native American Heritage Commission prior to the adoption or amendment of a city or county general plan for the purpose of protecting cultural places on lands affected by the proposal.

Your tribe's input is important to the City's planning process. We request that you advise us as early as possible if you wish to consult on the proposed project. Under SB 18, you have 90 days from the date of receipt of this notice to advise the City if you are interested in further consultation.

Attached is project location information and location maps. If you require any additional information or have any questions, please contact me at:

Michael Hofflinger, Planning Manager
Community Development Department
City of Chino Hills
14000 City Center Drive
Chino Hills, CA 91709
(909) 364-2777
mhofflinger@chinohills.org

City Council: Art Bennett ▪ Brian Johsz ▪ Ray Marquez ▪ Cynthia Moran ▪ Peter J. Rogers

Sincerely,
COMMUNITY DEVELOPMENT DEPARTMENT

Michael Hofflinger
Planning Manager

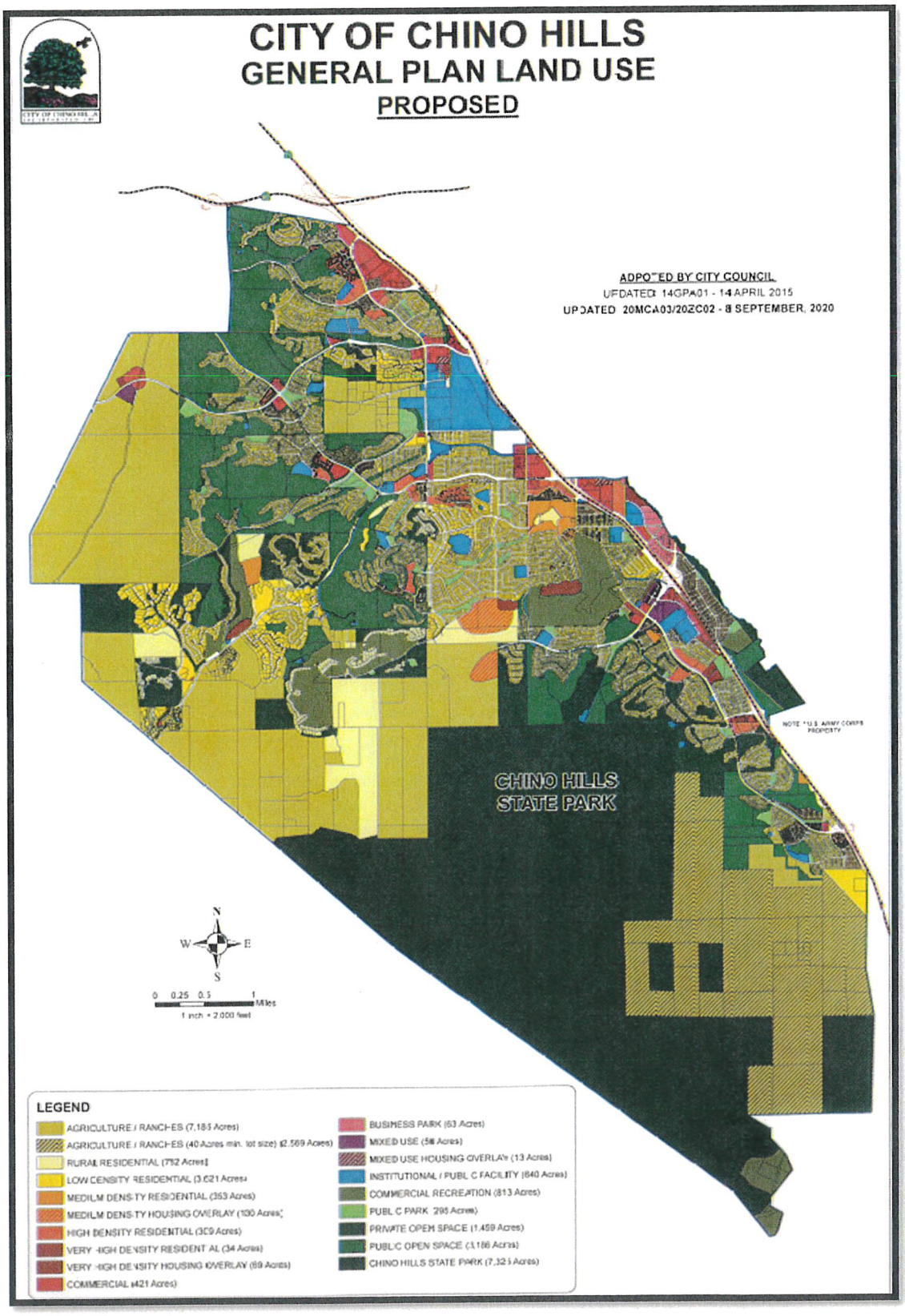
Enclosures:

Exhibit 1	City of Chino Hills Regional Location Map
Exhibit 2	City of Chino Hills Proposed General Plan Land Use Map

Exhibit 1


Bakersfield
Santa Barbara
Chino Hills
Los Angeles
San Bernardino
Riverside
Santa Ana
San Diego
MEXICO
Chino Hills, CA
Copyright Sperling's BestPlaces

Exhibit 2


CITY OF CHINO HILLS
GENERAL PLAN LAND USE
PROPOSED
ADOPTED BY CITY COUNCIL
UPDATED 14GPA01 - 14 APRIL 2015
UPDATED 20MCA03/20ZC02 - 8 SEPTEMBER, 2020
CHINO HILLS STATE PARK
N
W
E
S
0 0.25 0.5 1 Miles
1 inch = 2,000 feet
LEGEND
AGRICULTURE / RANCHES (7,185 Acres)
AGRICULTURE / RANCHES (40 Acres min. lot size) (2,569 Acres)
RURAL RESIDENTIAL (752 Acres)
LOW DENSITY RESIDENTIAL (3,621 Acres)
MEDIUM DENSITY RESIDENTIAL (353 Acres)
MEDIUM DENSITY HOUSING OVERLAY (100 Acres)
HIGH DENSITY RESIDENTIAL (309 Acres)
VERY HIGH DENSITY RESIDENTIAL (34 Acres)
VERY HIGH DENSITY HOUSING OVERLAY (89 Acres)
COMMERCIAL (421 Acres)
BUSINESS PARK (53 Acres)
MIXED USE (58 Acres)
MIXED USE HOUSING OVERLAY (13 Acres)
INSTITUTIONAL / PUBLIC FACILITY (840 Acres)
COMMERCIAL RECREATION (813 Acres)
PUBLIC PARK (295 Acres)
PRIVATE OPEN SPACE (1,459 Acres)
PUBLIC OPEN SPACE (3,186 Acres)
CHINO HILLS STATE PARK (7,325 Acres)

City of Chino Hills

14000 City Center Drive
Chino Hills, CA 91709
(909) 364-2600
www.chinohills.org

September 13, 2022

Bo Mazzetti, Chairperson
Rincon Band of Luiseno Indians
One Government Center Lane
Valley Center, CA 92082

SUBJECT: SENATE BILL (SB) 18 CONSULTATION - CITYWIDE GENERAL PLAN UPDATE (22GPA01)

Dear Mr. Mazzetti,

The City of Chino Hills is conducting a CEQA review for the above referenced Project, which includes a comprehensive General Plan Update for the entire City of Chino Hills. This letter is sent to inform you about the proposed project and to request your consultation pursuant to SB 18.

Because the proposed project includes a General Plan Land Use Map change, it must comply with California Public Resources Code § 65352.3 – 65352.4 (Senate Bill 18), which requires local governments to conduct meaningful consultation with California Native American tribes on the contact list maintained by the Native American Heritage Commission prior to the adoption or amendment of a city or county general plan for the purpose of protecting cultural places on lands affected by the proposal.

Your tribe's input is important to the City's planning process. We request that you advise us as early as possible if you wish to consult on the proposed project. Under SB 18, you have 90 days from the date of receipt of this notice to advise the City if you are interested in further consultation.

Attached is project location information and location maps. If you require any additional information or have any questions, please contact me at:

Michael Hofflinger, Planning Manager
Community Development Department
City of Chino Hills
14000 City Center Drive
Chino Hills, CA 91709
(909) 364-2777
mhofflinger@chinohills.org

City Council: Art Bennett ▪ Brian Johsz ▪ Ray Marquez ▪ Cynthia Moran ▪ Peter J. Rogers

Sincerely,
COMMUNITY DEVELOPMENT DEPARTMENT

Michael Hofflinger
Planning Manager

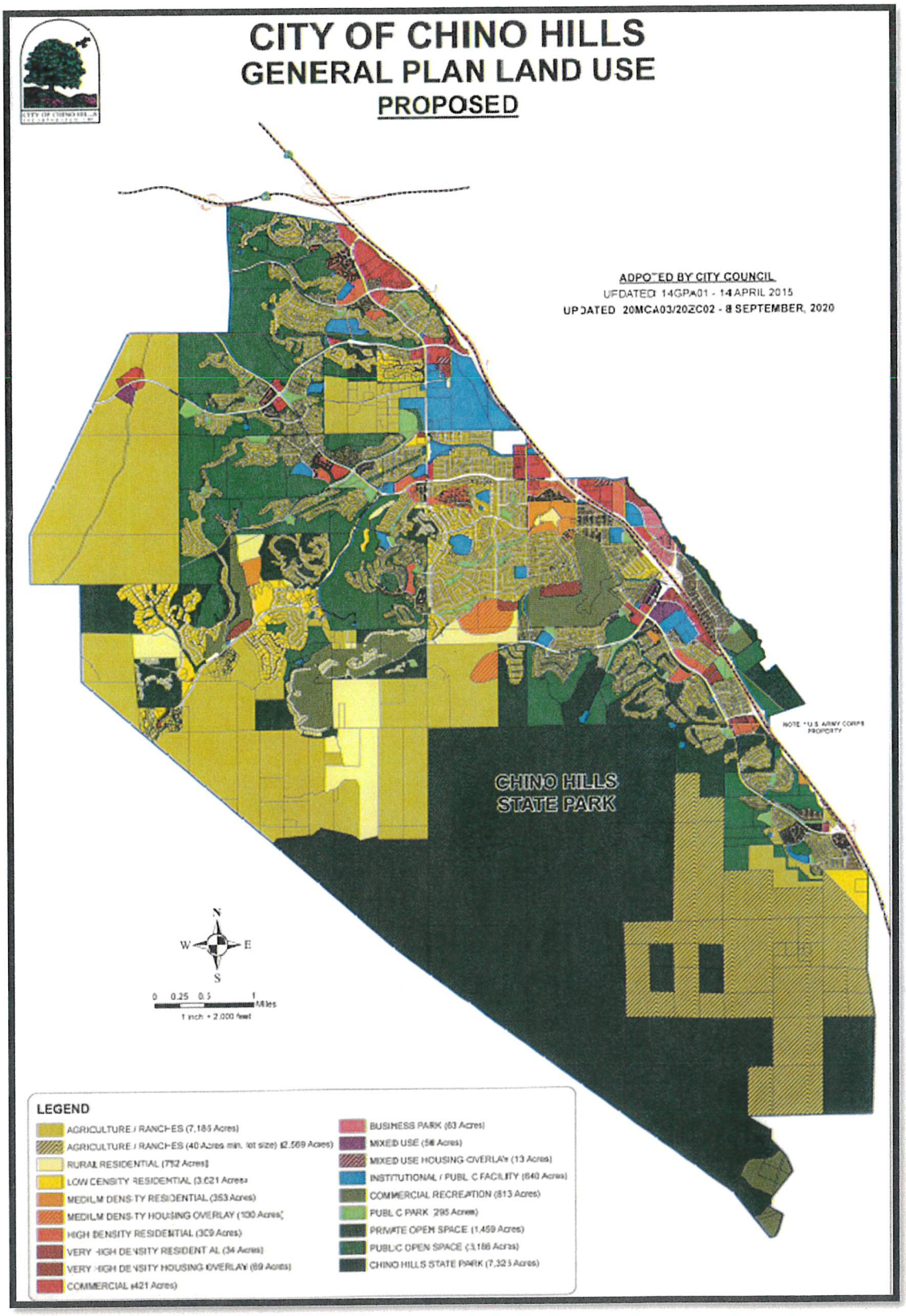
Enclosures:

Exhibit 1	City of Chino Hills Regional Location Map
Exhibit 2	City of Chino Hills Proposed General Plan Land Use Map

Exhibit 1


Bakersfield
Santa Barbara
Chino Hills
Los Angeles
San Bernardino
Riverside
Santa Ana
San Diego
MEXICO
Chino Hills, CA
Copyright Sperling's BestPlaces

Exhibit 2


CITY OF CHINO HILLS
GENERAL PLAN LAND USE
PROPOSED
ADOPTED BY CITY COUNCIL
UPDATED 14GPA01 - 14 APRIL 2015
UPDATED 20MCA03/20ZC02 - 8 SEPTEMBER, 2020
NOTE: *U.S. ARMY CORPS PROPERTY
CHINO HILLS STATE PARK
N
W
E
S
0 0.25 0.5 1 Miles
1 inch = 2,000 feet
LEGEND
AGRICULTURE / RANCHES (7,185 Acres)
AGRICULTURE / RANCHES (40 Acres min. lot size) (2,569 Acres)
RURAL RESIDENTIAL (752 Acres)
LOW DENSITY RESIDENTIAL (3,621 Acres)
MEDIUM DENSITY RESIDENTIAL (353 Acres)
MEDIUM DENSITY HOUSING OVERLAY (100 Acres)
HIGH DENSITY RESIDENTIAL (309 Acres)
VERY HIGH DENSITY RESIDENTIAL (34 Acres)
VERY HIGH DENSITY HOUSING OVERLAY (89 Acres)
COMMERCIAL (421 Acres)
BUSINESS PARK (63 Acres)
MIXED USE (56 Acres)
MIXED USE HOUSING OVERLAY (13 Acres)
INSTITUTIONAL / PUBLIC FACILITY (640 Acres)
COMMERCIAL RECREATION (813 Acres)
PUBLIC PARK (295 Acres)
PRIVATE OPEN SPACE (1,459 Acres)
PUBLIC OPEN SPACE (3,186 Acres)
CHINO HILLS STATE PARK (7,323 Acres)

City of Chino Hills

14000 City Center Drive
Chino Hills, CA 91709
(909) 364-2600
www.chinohills.org

September 13, 2022

Lovina Redner, Tribal Chair
Santa Rosa Band of Cahuilla Indians
P.O. Box 391820
Anza, CA 92539

SUBJECT: SENATE BILL (SB) 18 CONSULTATION - CITYWIDE GENERAL PLAN UPDATE (22GPA01)

Dear Ms. Redner,

The City of Chino Hills is conducting a CEQA review for the above referenced Project, which includes a comprehensive General Plan Update for the entire City of Chino Hills. This letter is sent to inform you about the proposed project and to request your consultation pursuant to SB 18.

Because the proposed project includes a General Plan Land Use Map change, it must comply with California Public Resources Code § 65352.3 – 65352.4 (Senate Bill 18), which requires local governments to conduct meaningful consultation with California Native American tribes on the contact list maintained by the Native American Heritage Commission prior to the adoption or amendment of a city or county general plan for the purpose of protecting cultural places on lands affected by the proposal.

Your tribe's input is important to the City's planning process. We request that you advise us as early as possible if you wish to consult on the proposed project. Under SB 18, you have 90 days from the date of receipt of this notice to advise the City if you are interested in further consultation.

Attached is project location information and location maps. If you require any additional information or have any questions, please contact me at:

Michael Hofflinger, Planning Manager
Community Development Department
City of Chino Hills
14000 City Center Drive
Chino Hills, CA 91709
(909) 364-2777
mhofflinger@chinohills.org

City Council: Art Bennett ▪ Brian Johsz ▪ Ray Marquez ▪ Cynthia Moran ▪ Peter J. Rogers

Sincerely,
COMMUNITY DEVELOPMENT DEPARTMENT



Michael Hofflinger
Planning Manager

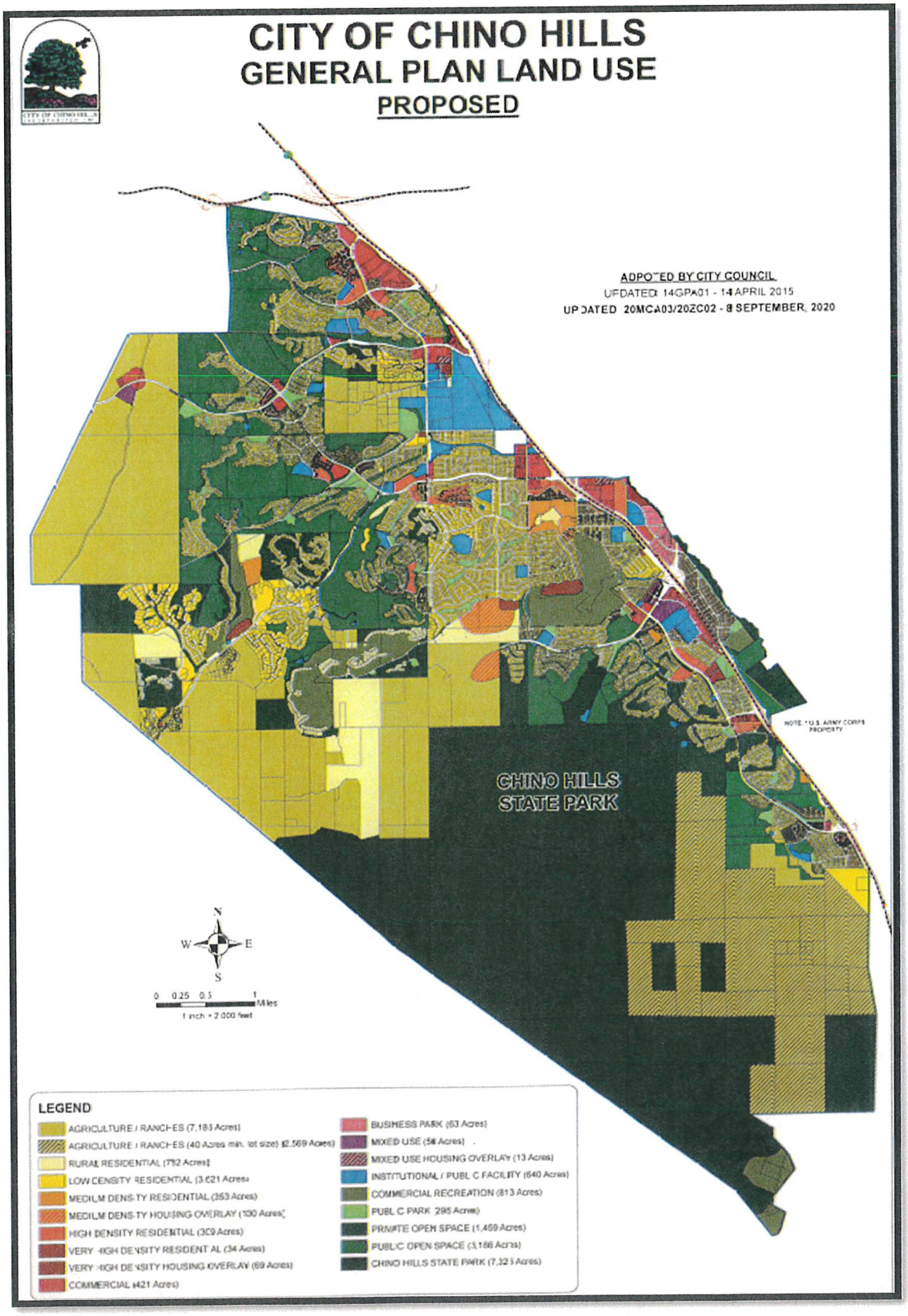
Enclosures:

Exhibit 1	City of Chino Hills Regional Location Map
Exhibit 2	City of Chino Hills Proposed General Plan Land Use Map

Exhibit 1


Bakersfield
Santa Barbara
Chino Hills
Los Angeles
San Bernardino
Riverside
Santa Ana
San Diego
MEXICO
Chino Hills, CA
Copyright Sperling's BestPlaces

Exhibit 2


CITY OF CHINO HILLS
GENERAL PLAN LAND USE
PROPOSED
ADOPTED BY CITY COUNCIL
UPDATED 14GPA01 - 14 APRIL 2015
UPDATED 20MCA03/20ZC02 - 8 SEPTEMBER, 2020
CHINO HILLS STATE PARK
NOTE: * U.S. ARMY CORPS PROPERTY
N
W
E
S
0 0.25 0.5 1 Miles
1 inch = 2,000 feet
LEGEND
AGRICULTURE / RANCHES (7,183 Acres)
AGRICULTURE / RANCHES (40 Acres min. lot size) (2,569 Acres)
RURAL RESIDENTIAL (792 Acres)
LOW DENSITY RESIDENTIAL (3,621 Acres)
MEDIUM DENSITY RESIDENTIAL (353 Acres)
MEDIUM DENSITY HOUSING OVERLAY (100 Acres)
HIGH DENSITY RESIDENTIAL (309 Acres)
VERY HIGH DENSITY RESIDENTIAL (34 Acres)
VERY HIGH DENSITY HOUSING OVERLAY (69 Acres)
COMMERCIAL (421 Acres)
BUSINESS PARK (63 Acres)
MIXED USE (56 Acres)
MIXED USE HOUSING OVERLAY (13 Acres)
INSTITUTIONAL / PUBLIC FACILITY (640 Acres)
COMMERCIAL RECREATION (813 Acres)
PUBLIC PARK (295 Acres)
PRIVATE OPEN SPACE (1,469 Acres)
PUBLIC OPEN SPACE (3,186 Acres)
CHINO HILLS STATE PARK (7,325 Acres)

City of Chino Hills

14000 City Center Drive
Chino Hills, CA 91709
(909) 364-2600
www.chinohills.org

September 13, 2022

Isaiah Vivanco, Chairperson
Soboba Band of Luiseno Indians
P. O. Box 487
San Jacinto, CA, 92581

SUBJECT: SENATE BILL (SB) 18 CONSULTATION - CITYWIDE GENERAL PLAN UPDATE (22GPA01)

Dear Mr. Vivanco,

The City of Chino Hills is conducting a CEQA review for the above referenced Project, which includes a comprehensive General Plan Update for the entire City of Chino Hills. This letter is sent to inform you about the proposed project and to request your consultation pursuant to SB 18.

Because the proposed project includes a General Plan Land Use Map change, it must comply with California Public Resources Code § 65352.3 – 65352.4 (Senate Bill 18), which requires local governments to conduct meaningful consultation with California Native American tribes on the contact list maintained by the Native American Heritage Commission prior to the adoption or amendment of a city or county general plan for the purpose of protecting cultural places on lands affected by the proposal.

Your tribe's input is important to the City's planning process. We request that you advise us as early as possible if you wish to consult on the proposed project. Under SB 18, you have 90 days from the date of receipt of this notice to advise the City if you are interested in further consultation.

Attached is project location information and location maps. If you require any additional information or have any questions, please contact me at:

Michael Hofflinger, Planning Manager
Community Development Department
City of Chino Hills
14000 City Center Drive
Chino Hills, CA 91709
(909) 364-2777
mhofflinger@chinohills.org

City Council: Art Bennett ▪ Brian Johsz ▪ Ray Marquez ▪ Cynthia Moran ▪ Peter J. Rogers

Sincerely,
COMMUNITY DEVELOPMENT DEPARTMENT



Michael Hofflinger
Planning Manager

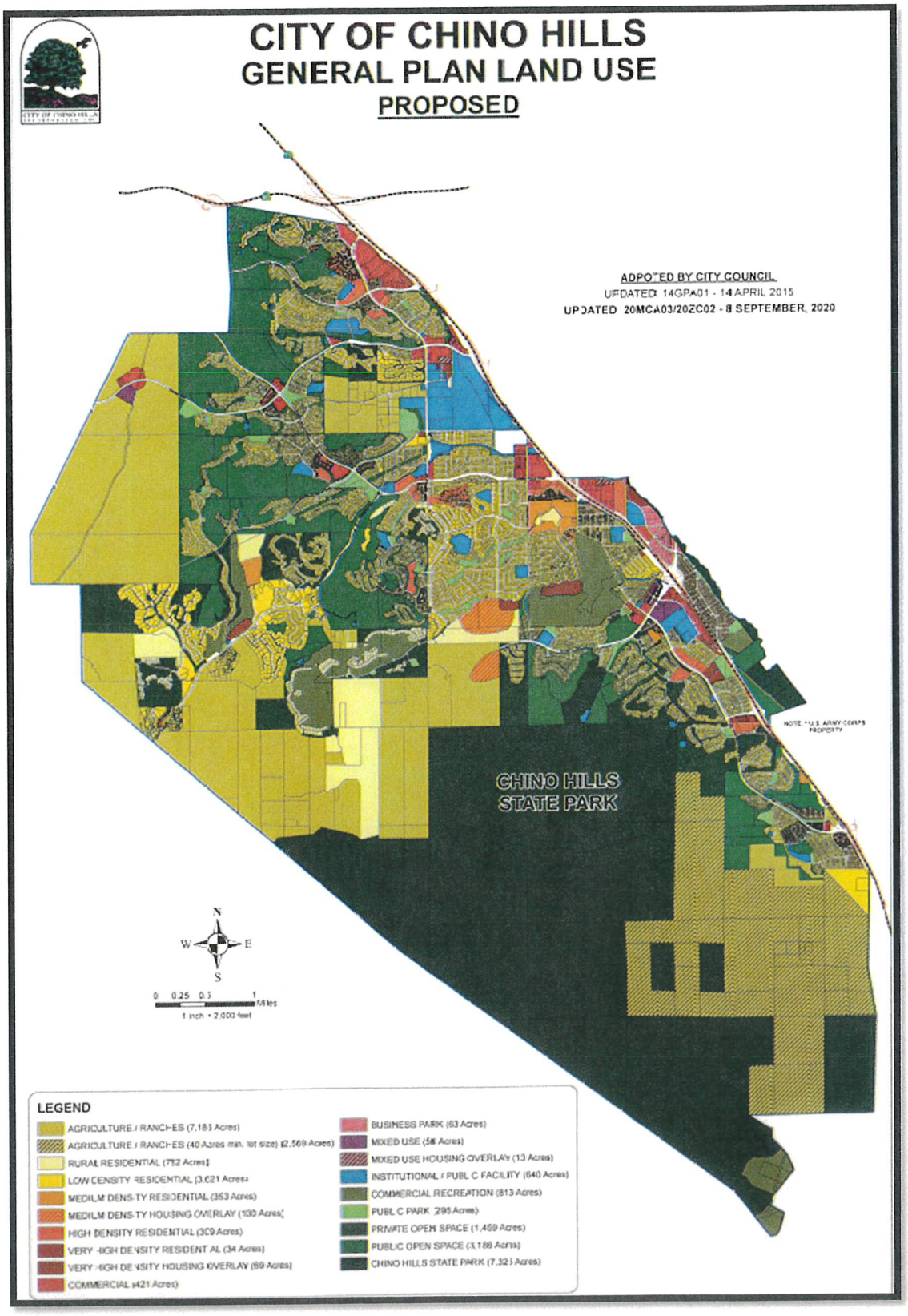
Enclosures:

Exhibit 1	City of Chino Hills Regional Location Map
Exhibit 2	City of Chino Hills Proposed General Plan Land Use Map

Exhibit 1


Bakersfield
Santa Barbara
Chino Hills
Los Angeles
San Bernardino
Riverside
Santa Ana
San Diego
MEXICO
Chino Hills, CA
Copyright Sperling's BestPlaces

Exhibit 2


CITY OF CHINO HILLS
GENERAL PLAN LAND USE
PROPOSED
ADOPTED BY CITY COUNCIL
UPDATED 14GPA01 - 14 APRIL 2015
UPDATED 20MCA03/20ZC02 - 8 SEPTEMBER, 2020
CHINO HILLS STATE PARK
N
W
E
S
0 0.25 0.5 1 Miles
1 inch = 2,000 feet
LEGEND
AGRICULTURE / RANCHES (7,183 Acres)
AGRICULTURE / RANCHES (40 Acres min. lot size) (2,569 Acres)
RURAL RESIDENTIAL (752 Acres)
LOW DENSITY RESIDENTIAL (3,621 Acres)
MEDIUM DENSITY RESIDENTIAL (353 Acres)
MEDIUM DENSITY HOUSING OVERLAY (100 Acres)
HIGH DENSITY RESIDENTIAL (309 Acres)
VERY HIGH DENSITY RESIDENTIAL (34 Acres)
VERY HIGH DENSITY HOUSING OVERLAY (69 Acres)
COMMERCIAL (421 Acres)
BUSINESS PARK (63 Acres)
MIXED USE (58 Acres)
MIXED USE HOUSING OVERLAY (13 Acres)
INSTITUTIONAL / PUBLIC FACILITY (640 Acres)
COMMERCIAL RECREATION (813 Acres)
PUBLIC PARK (295 Acres)
PRIVATE OPEN SPACE (1,459 Acres)
PUBLIC OPEN SPACE (3,186 Acres)
CHINO HILLS STATE PARK (7,323 Acres)

City of Chino Hills

14000 City Center Drive
Chino Hills, CA 91709
(909) 364-2600
www.chinohills.org

September 13, 2022

Joseph Ontiveros
Cultural Resources Director
Soboba Band of Luiseno Indians
PO Box 487
San Jacinto, CA 92581

SUBJECT: SENATE BILL (SB) 18 CONSULTATION - CITYWIDE GENERAL PLAN UPDATE (22GPA01)

Dear Mr. Ontiveros,

The City of Chino Hills is conducting a CEQA review for the above referenced Project, which includes a comprehensive General Plan Update for the entire City of Chino Hills. This letter is sent to inform you about the proposed project and to request your consultation pursuant to SB 18.

Because the proposed project includes a General Plan Land Use Map change, it must comply with California Public Resources Code § 65352.3 – 65352.4 (Senate Bill 18), which requires local governments to conduct meaningful consultation with California Native American tribes on the contact list maintained by the Native American Heritage Commission prior to the adoption or amendment of a city or county general plan for the purpose of protecting cultural places on lands affected by the proposal.

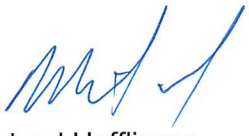
Your tribe's input is important to the City's planning process. We request that you advise us as early as possible if you wish to consult on the proposed project. Under SB 18, you have 90 days from the date of receipt of this notice to advise the City if you are interested in further consultation.

Attached is project location information and location maps. If you require any additional information or have any questions, please contact me at:

Michael Hofflinger, Planning Manager
Community Development Department
City of Chino Hills
14000 City Center Drive
Chino Hills, CA 91709
(909) 364-2777
mhofflinger@chinohills.org

City Council: Art Bennett ▪ Brian Johsz ▪ Ray Marquez ▪ Cynthia Moran ▪ Peter J. Rogers

Sincerely,
COMMUNITY DEVELOPMENT DEPARTMENT



Michael Hofflinger
Planning Manager

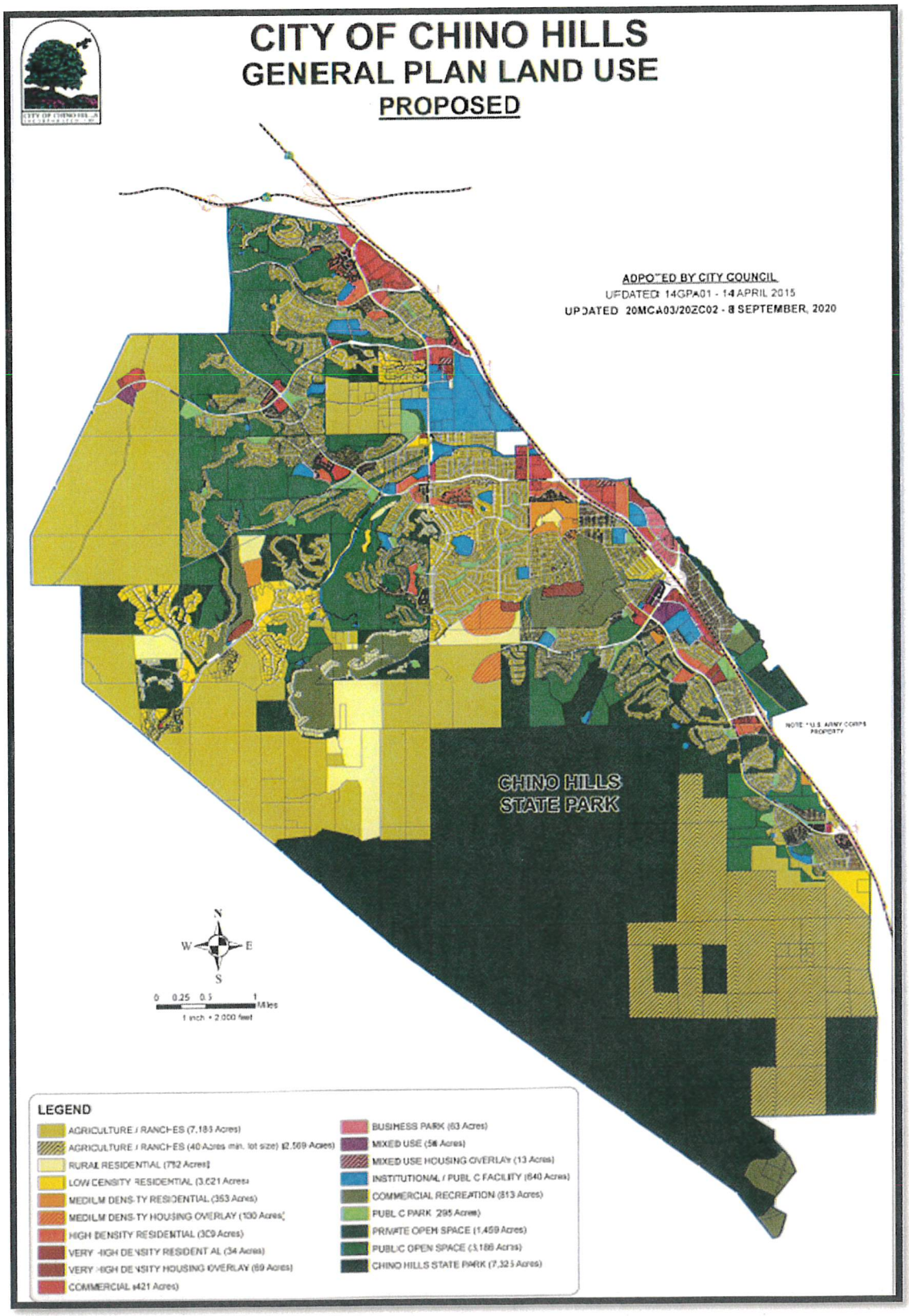
Enclosures:

Exhibit 1	City of Chino Hills Regional Location Map
Exhibit 2	City of Chino Hills Proposed General Plan Land Use Map

Exhibit 1


Bakersfield
Santa Barbara
Chino Hills
Los Angeles
San Bernardino
Riverside
Santa Ana
San Diego
MEXICO
Chino Hills, CA
Copyright Sperling's BestPlaces

Exhibit 2


CITY OF CHINO HILLS
GENERAL PLAN LAND USE
PROPOSED
ADOPTED BY CITY COUNCIL
UPDATED 14GPA01 - 14 APRIL 2015
UPDATED 20MCA03/20ZC02 - 8 SEPTEMBER, 2020
CHINO HILLS STATE PARK
N
W
E
S
0 0.25 0.5 1 Miles
1 inch = 2,000 feet
LEGEND
AGRICULTURE / RANCHES (7,183 Acres)
AGRICULTURE / RANCHES (40 Acres min. lot size) (2,569 Acres)
RURAL RESIDENTIAL (752 Acres)
LOW DENSITY RESIDENTIAL (3,021 Acres)
MEDIUM DENSITY RESIDENTIAL (353 Acres)
MEDIUM DENSITY HOUSING OVERLAY (100 Acres)
HIGH DENSITY RESIDENTIAL (309 Acres)
VERY HIGH DENSITY RESIDENTIAL (34 Acres)
VERY HIGH DENSITY HOUSING OVERLAY (69 Acres)
COMMERCIAL (421 Acres)
BUSINESS PARK (63 Acres)
MIXED USE (58 Acres)
MIXED USE HOUSING OVERLAY (13 Acres)
INSTITUTIONAL / PUBLIC FACILITY (640 Acres)
COMMERCIAL RECREATION (813 Acres)
PUBLIC PARK (295 Acres)
PRIVATE OPEN SPACE (1,459 Acres)
PUBLIC OPEN SPACE (3,188 Acres)
CHINO HILLS STATE PARK (7,325 Acres)

City of Chino Hills

14000 City Center Drive
Chino Hills, CA 91709
(909) 364-2600
www.chinohills.org

September 13, 2022

Anthony Morales, Chairperson
Gabrieleno/Tongva San Gabriel Band of Mission Indians
P.O. Box 693
San Gabriel, CA 91778

SUBJECT: SENATE BILL (SB) 18 CONSULTATION - CITYWIDE GENERAL PLAN UPDATE (22GPA01)

Dear Mr. Morales,

The City of Chino Hills is conducting a CEQA review for the above referenced Project, which includes a comprehensive General Plan Update for the entire City of Chino Hills. This letter is sent to inform you about the proposed project and to request your consultation pursuant to SB 18.

Because the proposed project includes a General Plan Land Use Map change, it must comply with California Public Resources Code § 65352.3 – 65352.4 (Senate Bill 18), which requires local governments to conduct meaningful consultation with California Native American tribes on the contact list maintained by the Native American Heritage Commission prior to the adoption or amendment of a city or county general plan for the purpose of protecting cultural places on lands affected by the proposal.

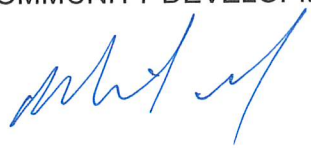
Your tribe's input is important to the City's planning process. We request that you advise us as early as possible if you wish to consult on the proposed project. Under SB 18, you have 90 days from the date of receipt of this notice to advise the City if you are interested in further consultation.

Attached is project location information and location maps. If you require any additional information or have any questions, please contact me at:

Michael Hofflinger, Planning Manager
Community Development Department
City of Chino Hills
14000 City Center Drive
Chino Hills, CA 91709
(909) 364-2777
mhofflinger@chinohills.org

City Council: Art Bennett ▪ Brian Johsz ▪ Ray Marquez ▪ Cynthia Moran ▪ Peter J. Rogers

Sincerely,
COMMUNITY DEVELOPMENT DEPARTMENT



Michael Hofflinger
Planning Manager

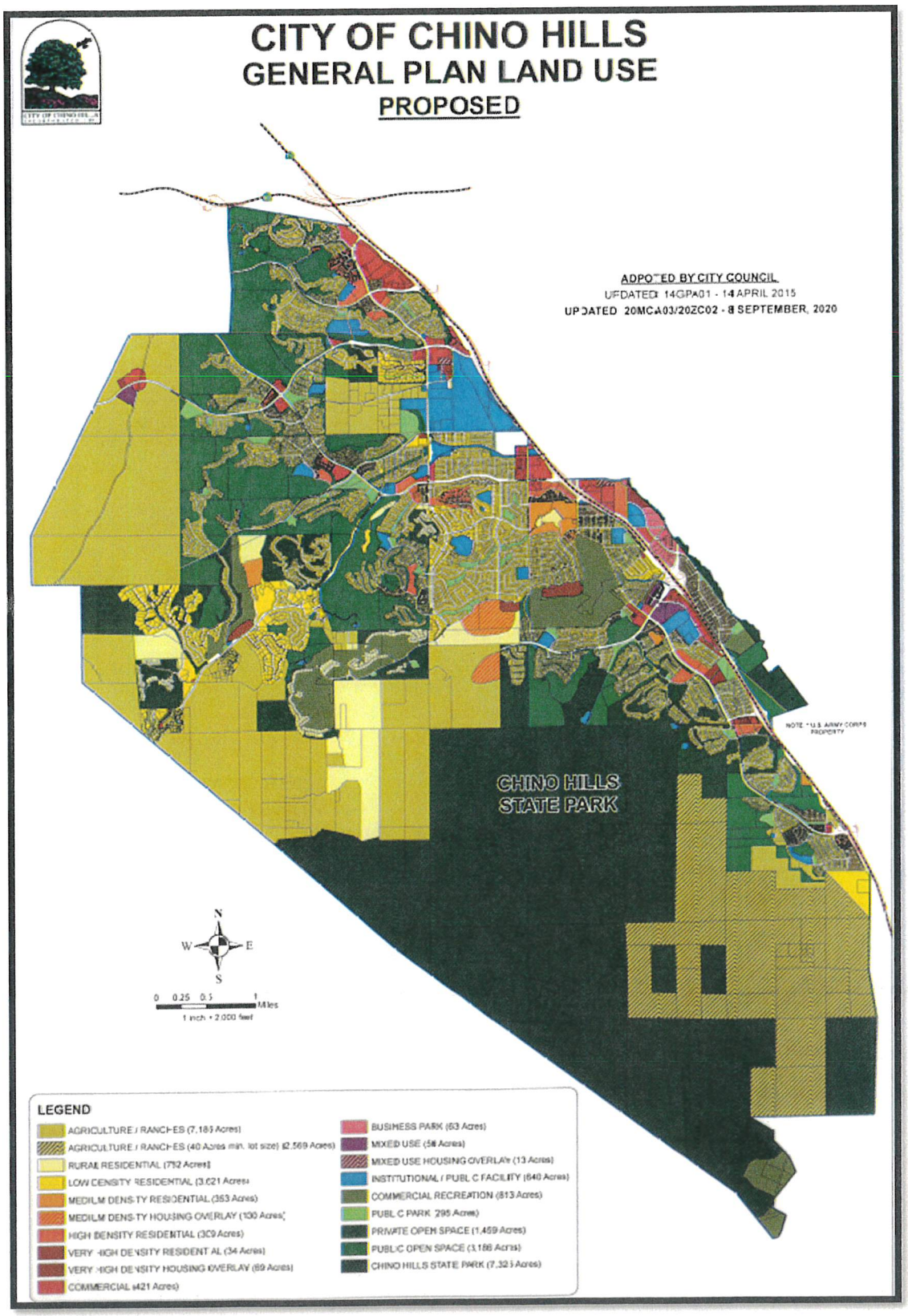
Enclosures:

Exhibit 1	City of Chino Hills Regional Location Map
Exhibit 2	City of Chino Hills Proposed General Plan Land Use Map

Exhibit 1


Bakersfield
Santa Barbara
CALIFORNIA
Chino Hills
Los Angeles
San Bernardino
Riverside
Santa Ana
San Diego
MEXICO
Chino Hills, CA
Copyright Sperling's BestPlaces

Exhibit 2


CITY OF CHINO HILLS
GENERAL PLAN LAND USE
PROPOSED
ADOPTED BY CITY COUNCIL
UPDATED 14GPA01 - 14 APRIL 2015
UPDATED 20MCA03/20ZC02 - 8 SEPTEMBER, 2020
CHINO HILLS STATE PARK
N
W
E
S
0 0.25 0.5 1 Miles
1 inch = 2,000 feet
LEGEND
AGRICULTURE / RANCHES (7,183 Acres)
AGRICULTURE / RANCHES (40 Acres min. lot size) (2,569 Acres)
RURAL RESIDENTIAL (752 Acres)
LOW DENSITY RESIDENTIAL (3,621 Acres)
MEDIUM DENSITY RESIDENTIAL (353 Acres)
MEDIUM DENSITY HOUSING OVERLAY (100 Acres)
HIGH DENSITY RESIDENTIAL (309 Acres)
VERY HIGH DENSITY RESIDENTIAL (34 Acres)
VERY HIGH DENSITY HOUSING OVERLAY (89 Acres)
COMMERCIAL (421 Acres)
BUSINESS PARK (53 Acres)
MIXED USE (58 Acres)
MIXED USE HOUSING OVERLAY (13 Acres)
INSTITUTIONAL / PUBLIC FACILITY (640 Acres)
COMMERCIAL RECREATION (813 Acres)
PUBLIC PARK (295 Acres)
PRIVATE OPEN SPACE (1,459 Acres)
PUBLIC OPEN SPACE (3,186 Acres)
CHINO HILLS STATE PARK (7,323 Acres)

City of Chino Hills

14000 City Center Drive
Chino Hills, CA 91709
(909) 364-2600
www.chinohills.org

September 13, 2022

Mark Macarro, Chairperson
Pechanga Band of Indians
P.O. Box 1477
Temecula, CA 92593

SUBJECT: SENATE BILL (SB) 18 CONSULTATION - CITYWIDE GENERAL PLAN UPDATE (22GPA01)

Dear Mr. Macarro,

The City of Chino Hills is conducting a CEQA review for the above referenced Project, which includes a comprehensive General Plan Update for the entire City of Chino Hills. This letter is sent to inform you about the proposed project and to request your consultation pursuant to SB 18.

Because the proposed project includes a General Plan Land Use Map change, it must comply with California Public Resources Code § 65352.3 – 65352.4 (Senate Bill 18), which requires local governments to conduct meaningful consultation with California Native American tribes on the contact list maintained by the Native American Heritage Commission prior to the adoption or amendment of a city or county general plan for the purpose of protecting cultural places on lands affected by the proposal.

Your tribe's input is important to the City's planning process. We request that you advise us as early as possible if you wish to consult on the proposed project. Under SB 18, you have 90 days from the date of receipt of this notice to advise the City if you are interested in further consultation.

Attached is project location information and location maps. If you require any additional information or have any questions, please contact me at:

Michael Hofflinger, Planning Manager
Community Development Department
City of Chino Hills
14000 City Center Drive
Chino Hills, CA 91709
(909) 364-2777
mhofflinger@chinohills.org

City Council: Art Bennett ▪ Brian Johsz ▪ Ray Marquez ▪ Cynthia Moran ▪ Peter J. Rogers

Sincerely,
COMMUNITY DEVELOPMENT DEPARTMENT

Michael Hofflinger
Planning Manager

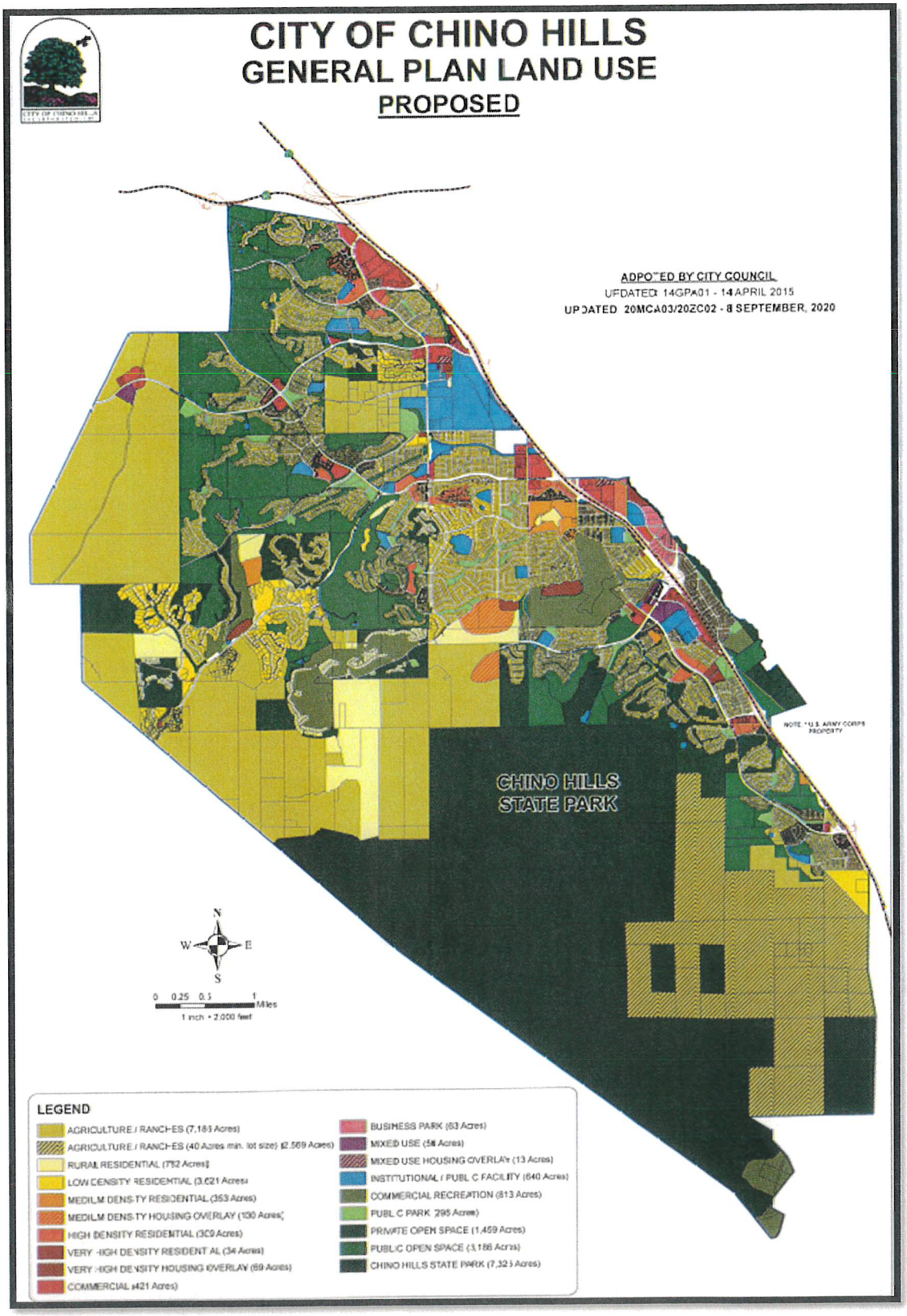
Enclosures:

Exhibit 1	City of Chino Hills Regional Location Map
Exhibit 2	City of Chino Hills Proposed General Plan Land Use Map

Exhibit 1


Bakersfield
Santa Barbara
CALIFORNIA
Chino Hills
Los Angeles
San Bernardino
Riverside
Santa Ana
San Diego
MEXICO
Chino Hills, CA
Copyright Sperling's BestPlaces

Exhibit 2


CITY OF CHINO HILLS
GENERAL PLAN LAND USE
PROPOSED
ADOPTED BY CITY COUNCIL
UPDATED 14GPA01 - 14 APRIL 2015
UPDATED 20MCA03/20ZC02 - 8 SEPTEMBER, 2020
CHINO HILLS STATE PARK
N
W
E
S
0 0.25 0.5 1 Miles
1 inch = 2,000 feet
LEGEND
AGRICULTURE / RANCHES (7,183 Acres)
AGRICULTURE / RANCHES (40 Acres min. lot size) (2,569 Acres)
RURAL RESIDENTIAL (752 Acres)
LOW DENSITY RESIDENTIAL (3,621 Acres)
MEDIUM DENSITY RESIDENTIAL (353 Acres)
MEDIUM DENSITY HOUSING OVERLAY (100 Acres)
HIGH DENSITY RESIDENTIAL (309 Acres)
VERY HIGH DENSITY RESIDENTIAL (34 Acres)
VERY HIGH DENSITY HOUSING OVERLAY (69 Acres)
COMMERCIAL (421 Acres)
BUSINESS PARK (63 Acres)
MIXED USE (58 Acres)
MIXED USE HOUSING OVERLAY (13 Acres)
INSTITUTIONAL / PUBLIC FACILITY (640 Acres)
COMMERCIAL RECREATION (813 Acres)
PUBLIC PARK (295 Acres)
PRIVATE OPEN SPACE (1,459 Acres)
PUBLIC OPEN SPACE (3,186 Acres)
CHINO HILLS STATE PARK (7,323 Acres)

APPENDIX C

California Department of Parks and Recreation Forms

CONFIDENTIAL – NOT FOR PUBLIC RELEASE

State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
PRIMARY RECORD

Primary #
HRI #
Trinomial
NRHP Status Code 6Z

Other Listings
Review Code | Reviewer | Date

 ***Resource Name or #:** Los Serranos Golf Club

P1. Other Identifier: Los Serranos Country Club
***P2. Location:** ☐**Not for Publication** ■ **Unrestricted** ***a. County:** San Bernardino
and (P2b and P2c or P2d. Attach a Location Map as necessary.)
***b. USGS 7.5' Quad:** Prado Dam **Date:** 1967 (1982 edition) **T** 2S; **R** 8W; **¼ of ¼ of Sec** (unsectioned), S.B. **B.M.**
c. Address: 15656 Yorba Ave City: Chino Hills Zip: 91709
d. UTM: Zone mE / mN
e. Other Locational Data: APNs 1028-351-01-0000, 1028-471-01-0000, 1028-351-02-0000, 1028-056-05-0000, 1028-531-60-0000

***P3a. Description:**
The Los Serranos Golf Club is situated on multiple parcels totaling approximately 312 acres. Generally L-shaped, the golf club includes a section oriented north-south parallel to Yorba Avenue, and a section oriented east-west. The facility includes two 18-hole courses: the 6,691-yard north course, and the 7,628-yard south course (Los Serranos Golf Club 2018a, 2018b), driving range, putting green, and clubhouse, golf cart, starter, maintenance, ancillary, and two snack bar buildings, sand traps, a large water hazard near the southwest end of the property, and numerous paved paths. A paved parking lot is adjacent to and north of the clubhouse, and is enclosed by a low concrete block wall that is painted white. A wooden sign located near the curb announces, "Jack Kramer's Los Serranos Country Club" and displays a man on horseback. The golf course terrain is undulating and features many mature trees. The surrounding setting includes residential development in all directions, as well as an area of open space to the west. Continued on page 4.

***P3b. Resource Attributes:** HP39. Other – Golf Course
***P4. Resources Present:** ☐Building ☐Structure ☐Object ■Site ☐District ☐Element of District ☐Other (Isolates, etc.)

P5a. Photo or Drawing



P5b. Description of Photo:
Photo 1. Overview of clubhouse from Yorba Ave, view facing west.

***P6. Date Constructed/Age and Sources:** ■Historic ☐Prehistoric ☐Both
1925

***P7. Owner and Address:**
Greening Family LLC (County of San Bernardino)

***P8. Recorded by:**
Susan Zamudio-Gurrola
SWCA Environmental Consultants
51 W Dayton Street
Pasadena, CA 91105

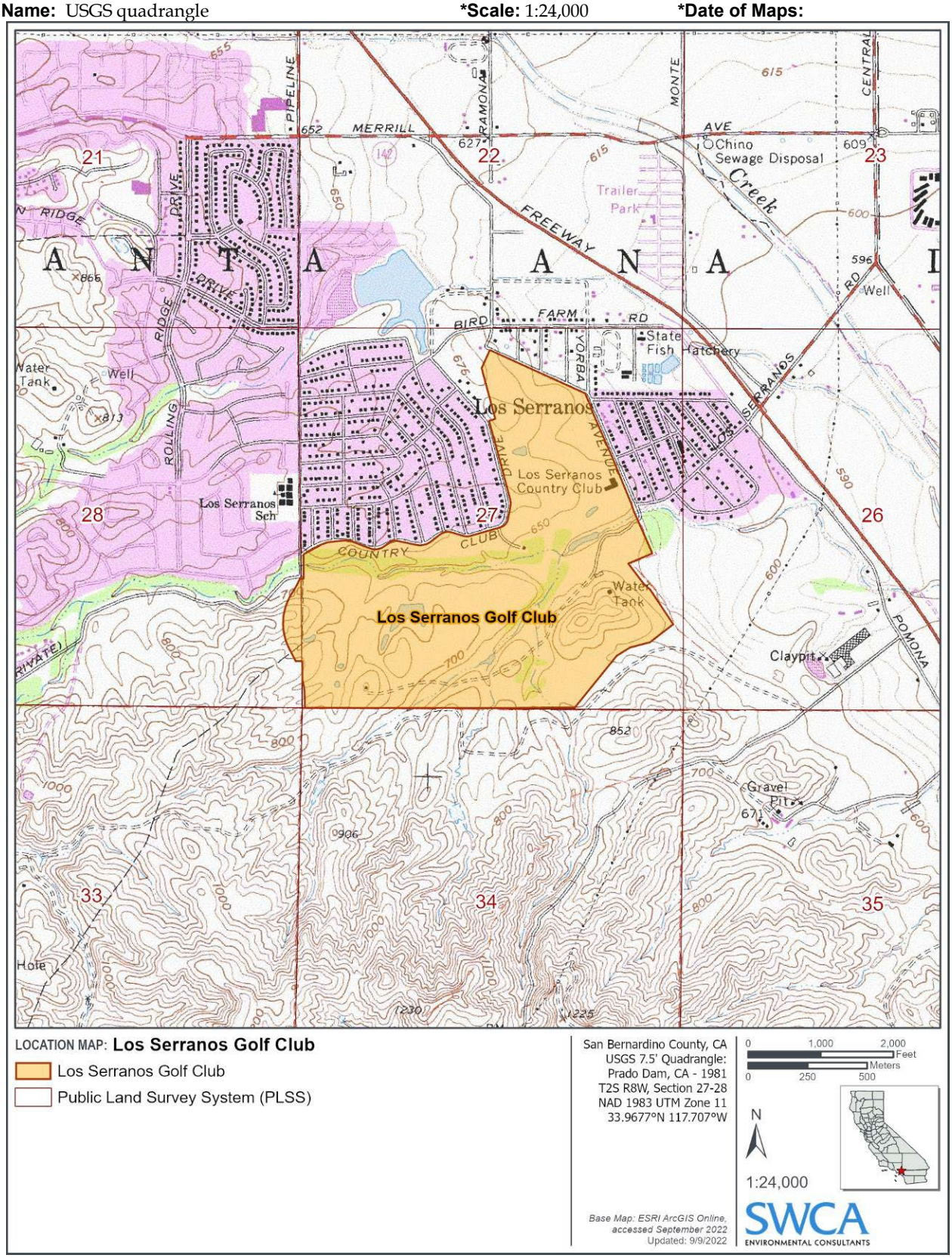
***P9. Date Recorded:** 7/5/2022

***P10. Survey Type:** Intensive

***P11. Report Citation:**
Zamudio-Gurrola, Susan, Denniston, Liz and Debi Howell-Ardila. 2022. Cultural Resources Technical Report for the Chino Hills General Plan Update, City of Chino Hills, California. Prepared for EcoTierra Consulting, Inc. and the City of Chino Hills. SWCA Environmental Consultants, Pasadena, California.

***Attachments:** ☐NONE ■Location Map ☐Sketch Map ■Continuation Sheet ■Building, Structure, and Object Record ☐Archaeological Record ☐District Record ☐Linear Feature Record ☐Milling Station Record ☐Rock Art Record ☐Artifact Record ☐Photograph Record ☐ Other (List):

***Map Name:** USGS quadrangle ***Scale:** 1:24,000 ***Date of Maps:**



B1. Historic Name: Los Serranos Country Club
B2. Common Name:
B3. Original Use: Country club B4. Present Use: Golf club

***B5. Architectural Style:** The clubhouse, maintenance, and starter buildings portray a contemporary Mission Revival style; other buildings such as the two snack bars and ancillary building near Yorba Ave have no discernible style.

***B6. Construction History:** The country club was originally developed between 1924 and 1925. The former Bridger adobe was enlarged and remodeled as the clubhouse. Rental cabanas were developed at the southeast end of the property but were removed in ca. 1950. The country club has been greatly reduced in size and original features were eliminated. The maintenance building was built ca. 1960 and enlarged ca. 1990; the current clubhouse was built in 1996; and ancillary buildings were built between the 1970s and ca. 2000. The north course's original configuration and features have been altered, and a south course was added in 1962 (*Colton Daily Courier* 1925; *Long Beach Telegram* 1924b; *San Bernardino Daily Sun* 1925; Los Serranos Golf Club 1997; NETRonline 1938-2020; Miranda 2022; UCSB Library 1935, 1937; Google Earth 2022).

***B7. Moved?** ■**No** ☐**Yes** ☐**Unknown** **Date:** **Original Location:**

***B8. Related Features:**

B9a. Architect: John Duncan Dunn - original golf course architect b. Builder: Unknown

***B10. Significance: Theme:** Recreation **Area:** Chino Hills, California

Period of Significance: N/A **Property Type:** N/A **Applicable Criteria:** N/A

The Los Serranos Country Club was conceived in 1923 by a group of investors headed by Harlow C. Davidson, a Long Beach real estate developer. In December 1923, the group purchased approximately 750 acres of the former Rancho Santa Ana del Chino, a Mexican-period land grant, from the Chino Land and Water Company (*Long Beach Telegram* 1924a; Spitzzeri 2020).

Rancho Santa Ana del Chino was granted in 1841 to Antonio Maria Lugo, a former soldier under the king of Spain (Barrows 1914; Shumway 2007). Soon thereafter, he turned over management of the rancho to his son-in-law Isaac Williams, who had married María de Jesús Lugo in 1839. Williams eventually purchased the rancho from Lugo for $10,000 (*Long Beach Telegram* 1924d). After Williams' death in 1856, his daughter Francisca Williams MacDougall hired her brother-in-law Joseph Bridger to manage the property as she lived distant from the ranch in Los Angeles. Bridger was married to Francisca's half-sister, Victoria Regina Williams, who was Isaac Williams' daughter with María Antonia Apis. Bridger built an adobe house on a portion of the property called the "Home Ranch" (on which the Los Serranos Golf Club is located today). He managed the ranch from 1865 until his death in 1880 (Spitzzeri 2018a, 2018d, 2020). The following year, Francisca sold the ranch to the mining tycoon Richard Gird, who moved with his wife Nellie into Bridger's adobe. Gird raised horses and cattle, many of which grazed in the Chino Hills, expanded agricultural crops, and established the Chino townsite. By the early 1890s, Gird was financially overextended, took out a loan, and assertively sought to sell portions of the ranch. Ultimately, a group of investors formed the Chino Land and Water Company, and took over Gird's mortgage. A subsidiary company liquidated the ranch's assets. In late 1923, the company sold a large portion of the ranch to Davidson and the group of investors who developed the Los Serranos Country Club (Spitzzeri 2019a, 2019b, 2020).

As described in local newspapers at the time, the investors acquired 750 acres that included a 40-acre lake, waterfall, and a 20-acre park area with exotic trees planted in the late 1800s. California redwood trees and a Japanese garden were noted. The country club was planned to include two 18-hole golf courses, a polo field, swimming, boating, and other outdoor sports (*Long Beach Telegram* 1924a, 1924c). Continued on page 4.



B11. Additional Resource Attributes: (List attributes and codes)

***B12. References:** See continuation sheet, page 9.

B13. Remarks:

***B14. Evaluator:** Susan Zamudio-Gurrola, SWCA.

***Date of Evaluation:** July 14, 2022

(This space reserved for official comments.)

Recorded By: Susan Zamudio-Gurrola ***Date:** July 14, 2022 ■ Continuation ☐Update

P3a. Description, continued:

Clubhouse – The clubhouse was constructed in 1996 (Los Serranos Golf Club 1997). Designed in a contemporary Mission Revival style, the building is one story with high ceilings. It rests on a concrete foundation and has an irregular footprint. A hipped, tiled roof with markedly protruding rafter rails covers the majority of the building, although the center of the roof is flat to support mechanical equipment and is edged at the north façade with a stepped, stuccoed parapet. The building exterior is sheathed in smooth stucco. Projecting from the north façade is a porte cochere supported by large, smooth columns and topped by a short tower. The tower is capped by a hipped, tiled roof with protruding rafter tails, and displays arched openings with metal bells suspended from wooden beams. Accessed via the porte cochere, the primary entrance consists of wooden double doors with glazing and is surrounded by a transom and wide sidelights. The north façade and east elevation display broad blind arches with no or minimal windows, concealing the view to the parking lot. Fenestration is concentrated on the west and south elevations facing the golf course, and consists of large expanses of metal-framed windows (Photos 1 and 2).

Starter Building – The starter building was constructed in circa 1975 (NETRonline 1938-2020). Located southwest of the clubhouse is a small wood-frame building where the starter (a staff person) directs players to the first tee at the appropriate time. The building has a square footprint and rests on a concrete foundation. It has a hipped, tiled roof with widely overhanging eaves and closed soffits. The lower half of the building exterior is covered with textured stucco, and is topped by metal-framed fixed and sliding windows on all sides. Th entry door on the south elevation appears to be wooden with a single-hung aluminum-framed window (Photo 3)

Snack Bar Buildings – The snack bar buildings were constructed in circa 1990 (NETRonline 1938-2020). There are two small snack bar buildings on the golf course, one within the north course, and one within the south course. The small buildings have rectangular plans and are clad with smooth river rock. These buildings were not documented in detail.

Maintenance building – The maintenance building was constructed between 1959 and 1966 southwest of the clubhouse, near the southeastern edge of the golf club property. It originally had an L-shaped footprint (NETRonline 1938-2020). An addition consisting of the eastern wing was built between 1987 and 1994, creating a U-shaped footprint surrounding a maintenance yard (NETRonline 1938-2020). The building displays a contemporary Mission Revival style similar to the clubhouse, indicating it has been remodeled since its original construction. The building is topped by a gable-on-hip roof clad with red barrel tile. Its exterior is sheathed in textured stucco and displays blind arches with wide engaged pilasters on the north elevation. The elevations facing inward towards the maintenance yard display numerous metal roll-up garage doors. Wide engaged pilasters separate each garage door (Photo 4).

Ancillary Building – An ancillary building was constructed in circa 2000 north of the parking lot near Yorba Avenue (NETRonline 1938-2020). Although not clearly visible due to fencing and foliage, it appears to have a rectangular footprint and walls composed of light gray textured brick or block. It is topped by a gabled roof clad with red barrel tile. There is a decorative metal vent screen under the gable peak (Photo 5).

B10. Significance, continued:

Architect/Designer

John Duncan Dunn, a native of Scotland, came from a well-known golfing family of which his father, uncle, grandfather, mother, and brother were all involved in golf – either as players, professionals, or designers. Dunn established a club-making business with his brother in 1892, and laid out many early golf courses in the Netherlands. In 1895, he took a trip to America, and later returned to join his uncle at the Ardsley-on-Hudson Country Club.

Among his various golf-related business endeavors, Dunn opened a shop in Manhattan, and took over his uncle's position as the manager of the BGI Company. Dunn began making a name for himself in golf course design after working on several courses in Florida. In 1902, he moved to California, and served as a golf professional at Los Angeles Country Club. Dunn left for some time to work in France, but returned to the U.S., after which he designed courses in Lake Tahoe and at Los Serranos. Dunn also wrote articles and instructional books about the sport (Mckinnon, n.d.; Antique Golf Clubs from Scotland 2021). Dunn designed the original (north course) at Los Serranos; however, the second planned course was not constructed (GolfClubAtlas 2004-2016). Dunn died in 1951 (Golf Pass 2022).

Continued on page 5.

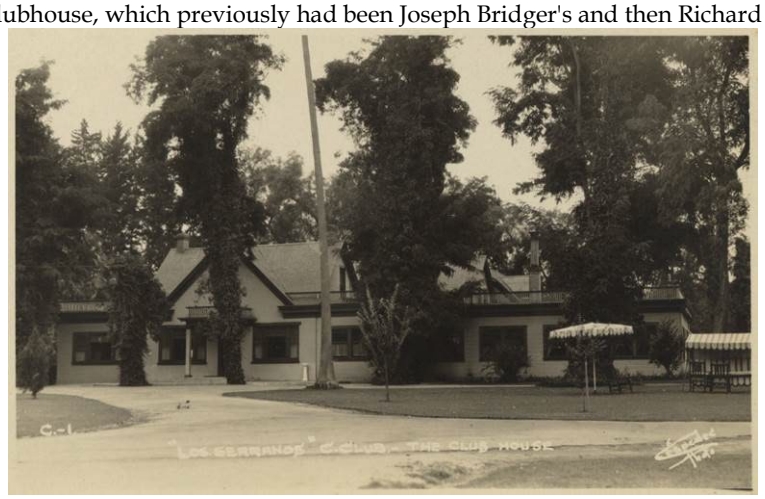
Recorded By: Susan Zamudio-Gurrola ***Date:** July 14, 2022 ■ Continuation ☐Update

B10. Significance, continued:

The country club was "named after the peaceful Serranos Indians that lived there long before white men with beards and lances trod upon California's garden lands." (*Long Beach Press* 1924). Directing the club's development was W.G. Hamilton, who had been involved in several other country clubs in the Southern California area. John Duncan Dunn was hired to design the golf courses (*Long Beach Telegram* 1924a).

Los Serranos Country Club officially opened April 25, 1925 (*Colton Daily Courier* 1925). The former Bridger/Gird adobe, described as a "large, aristocratic mansion," was enlarged and remodeled to repurpose it as a clubhouse (*Long Beach Telegram* 1924c; *San Bernardino Daily Sun* 1925) (Figure 1). An announcement of the grand opening stated the "Feature event of the day will be the dedication of the 18-hole championship links" indicating the second planned 18-hole course was not built (*Colton Daily Courier* 1925). The original driving range was located where the parking lot is today (Miranda 2022). Rental cabanas were built south of the clubhouse, although their exact construction date was not determined (Figure 2). The country club property also included present-day Lake Serranos to the north.

Figure 1. The original clubhouse, which previously had been Joseph Bridger's and then Richard Gird's adobe residence.



Source: Spitzzeri 2020; California State Library

Figure 2. The rectangular clubhouse off the entry drive (top) and group of rental cabanas to the southwest (bottom) in 1935



Source: UCSB Library 1935

Continued on page 6.

Recorded By: Susan Zamudio-Gurrola ***Date:** July 14, 2022 ■ Continuation ☐Update

B10. Significance, continued:

Only a year after its opening, in 1926, H.C. Davidson's investment company sold the country club to a syndicate composed of club members described in the local newspaper as out-of-towners. The sale included 350 acres of the club property and 350 acres of surrounding land. In this way, members would participate in the club's administration and financial management. Participating memberships were sold to those who desired them. It was also announced at the time that nearby land would be developed as a community of country homes (*Chino Champion* 1926a, 1926b). Members of the club were able to purchase small lots adjacent to the course (City of Chino Hills, n.d.). Streets were named after historical figures and places such as Lugo and Gird Avenues and Los Serranos Boulevard. It appears the homes were modest in scale, as they were locally referred as bungalows (*Chino Champion* 1927b, 1937). Early homes built in this area, along with Sleepy Hollow in Carbon Canyon, were some of the earliest in what would later become the City of Chino Hills (City of Chino Hills 2022). However, the lots adjacent to Los Serranos Golf Course were developed rather slowly. In 1938, only a handful of homes had been built, and in 1946, the area was still very sparsely developed. The lots gradually filled in and it was not until about 1980 that the area appeared nearly built out (NETRonline 1938-2020).

Figure 3. A handful of homes had been built adjacent to the club by 1935 (left); lots were still sparsely developed in 1946 (right)



Source: UCSB Library



Source: UCSB Library

With the ownership change, several improvements were planned, including rearranging holes one and nine to be closer to the club house, and construction of a swimming pool, a new golf house, and an ornamental gate and lodge at the entrance (*Chino Champion* 1926c). However, it appears some of these improvements were not immediately started, and just one year later, a new owner for the country club was announced. O.W. Heinz and associates, based in Los Angeles, acquired the country club by November 1927. It was then that major improvements seemed to get underway. The contract was authorized for a 60-foot by 125-foot swimming pool (although research to date has not determined its location on the property), an outdoor dance pavilion was constructed, and a 2,000-foot-long swimming beach on the lake was developed. Additionally, a toboggan slide and water wheel were installed at the beach, and water was fed into the arroyos to allow for canoeing and to create water hazards for the golf course (*Chino Champion* 1927b).

The country club changed hands many times through the mid-century, and was referred to by different names, including Rancho Don Lugo Golf Course, and Pomona Valley Country Club. While the details of each transaction and owner were not definitively ascertained, research to date revealed that a syndicate headed by Gordon Bell bought the property in 1946 for $155,000. The syndicate was composed of Mr. and Mrs. Gordon Bell, Mr. and Mrs. Gray Phelps, Mr. and Mrs. John W. Dawson, Kersey Kinsey, and R. Glenn Daugherty. By 1948, the property was sold to either Mel and Connie Rogers or Mel's brother Ken Rogers (depending on the source). Ken, who was a retired Army officer and golfer, was originally from Dallas but moved around extensively during his time in the military. It is not clear if Ken's brother Mel served as manager of the golf club, was a co-owner, or outright owner with Connie (*Chino Champion* 1948a, 1948b; *San Bernardino County Sun* 1953; Spitzzeri 2021). Mel and Connie Rogers experienced legal issues with the California Public Utilities Commission, and in addition, Ken Rogers and realtor Clara Blum Bartlett sued Mel and Connie, resulting in a judgment in late 1948 that gave Ken Rogers and Clara Bartlett control of the club. Subsequently, Bartlett acquired Ken's half-interest and gained full control of the club (Chino Champion 1953a; San Bernardino County Sun 1953; Spitzzeri 2021). Continued on page 7.

Recorded By: Susan Zamudio-Gurrola ***Date:** July 14, 2022 ■ Continuation ☐Update

B10. Significance, continued:

Not long after the Rogers acquired the club, they sought to sell the property, and in mid-1949, it was announced that a group of African American investors were seeking to purchase it. Headed by Lemuel Pratt Grant, the group was reported to include boxer Joe Lewis, actor Eddie Anderson, and athlete Woody Strode. Grant owned a brick and tile business, and was a pioneer golfer in the African American community. Opposition quickly rose in the community - an organization was formed called "Los Serranos Business Club" which worked to block the sale. Despite a well-attended event to publicize the club and sign up new members, the property sale fell apart.

During her tenure, Bartlett completed improvements to the clubhouse, and had plaques installed on trees that she discovered were not indigenous and were rare to the area. However, problems with the water system and related water shortage resulted in the golf course being maintained in less than ideal conditions (*Chino Champion* 1950, 1953c). In June 1953, Bartlett sold the country club - which had been reduced to 320 acres - and its water system to Paul Greening, who owned the adjacent approximately 2,500-acre ranch (referred to as Rolling Ridge or Rolling Hills). Greening was a rancher with a number of other financial interests who had recently relocated to the area from Newport Beach (*Pomona Progress Bulletin* 1953; *Chino Champion* 1953a; *San Bernardino County Sun* 1953). Shortly after the purchase, Greening closed the golf course, but began making improvements to the water system (*Chino Champion* August 6, 1953). He offered the golf course and clubhouse for lease, and indicated that if a lease was not arranged, the course would be converted to agricultural purposes and the clubhouse would be torn down (*Los Angeles Times* 1953a).

By late 1953, a lease was arranged with a group composed of tennis professional Jack Kramer, golf professional Zell Eaton, and Pasadena businessman W.E. Cranston (*Los Angeles Times* 1953b). The men updated the golf course layout, and reopened it for public use in February 1954 with nine holes. A temporary grouping of holes was created to put the course into operation, but they were not meant to be a permanent front or back nine. Additional changes were made to the course with the goal "to make it appeal more to the average golfer." (*Pomona Progress Bulletin* 1954). It was designed to be easier and shorter than the previous course, and several new greens were constructed (*Pomona Progress Bulletin* 1954). The *Los Angeles Times* provided a summary of the state of Los Serranos at the time, stating:

> "The course was in horrible condition, almost abandoned…It has been redesigned, eliminating several of the less interesting holes at the southwest end of the course…and building some new holes including an 18th which will be directly in front of the clubhouse. Overall length is considerably shorter than the old course. Nine holes were opened a short time ago…Fairways are pretty rough now but an entirely new watering system…should begin to pay off. We'd say the net result of the changes will be to make it an easier course for high handicappers but just as interesting as the old layout." (Curtis 1954).

By 1961, Jack Kramer became sole owner of the club (Los Serranos Country Club 2021). He developed a second golf course, called the south course, in 1962. It became known as “Jack’s Blacks” and held the record for the longest golf course in California until surpassed by Torrey Pines and Martis Camp in the 2000s (Youngman 2020). The maintenance building was constructed around this time with a L-shaped footprint, and the eastern wing was built between 1987 and 1994, creating the building’s current U-shaped footprint (NETRonline 1938-2020). Building permit records for the property show that a permit was issued in 1994 which included an addition and remodel of the clubhouse, as well as demolition work. While the building permit does not provide details on the demolition, local newspaper account indicates the original clubhouse was razed (*Chino Hills Champion* 1994) (Figure 4). Los Serranos Golf Club staff also indicates the current clubhouse is all new construction (Miranda 2022). The project included 3,800 sq. ft. of office space, 4,645 sq. ft. of clubhouse space, 8,100 sq. ft. of kitchen space and patios. The architect for the project was Schneider Architects and Associates, and the contractor was Charles Licha (City of Chino Hills, var.).

The Greening family (Jay Greening) continues to own the property, and the Kramer family continues to own and operate the golf club business, leasing the land from Mr. Greening. Jack Kramer died in 2009 (Goldstein 2009; Napoles 2018).

Continued on page 8.

Figure 4. Demolition of the original clubhouse in a 1994 photo



Country club redo

The walls of a 70-year-old building come down at Los Serranos Country Club to make way for a new club house. The razed building, part of th e original country club which opened in 1925, housed locker rooms, kitchen, a meeting room and finance office. In the center, workers found an old chimney, the base of which was in the basement, which had been filled in long ago. The new clubhouse will envelope all the old one except the prop shop.

Source: *Chino Hills Champion* 1994.

The changes and alterations that have taken place at the property over the decades have resulted in a nearly 50 percent reduction of its size, from the original 750 acres to approximately 320. In addition, the property's features have been affected by the substantial changes in the function and amenities provided at the club. Original features that were removed or are no longer part of the property include: the lake, beach and water toboggan; equestrian facilities; rental cabanas; and the original clubhouse. The golf facility has changed from a single 18-hole golf course to two 18-hole golf courses, with the second course developed 37 years after the original. Additionally, the configuration and features of the original north course have been altered, notably the locations of holes 1, 2, 5, 6, 16, 17, and 18, and the driving range (UCSB Library 1935, 1937; Google Earth 2022; Miranda 2022). New buildings were constructed on the property through circa 2000.

National Register of Historic Places/California Register of Historical Resources Evaluation:

Criteria A/1 (Events)

The Los Serranos Golf Club (aka Los Serranos Country Club) was originally developed in 1924 as a private country club with expansive recreational facilities, including one 18-hole golf course, facilities for fishing and water sports, a private lake with a beach, rental cabanas, and equestrian facilities. Changing hands many times from its opening in 1925 through the 1950s, the property and its owners appear to have struggled to maintain a successful business. Although the Los Serranos Golf Club property is associated with the development of early recreational facilities in the Chino Hills, the country club was not remarkable as a business, as evidenced by the frequent ownership changes, known maintenance issues, and elimination over the years of amenities such as the rental cabanas and equestrian and water sports. In the course of the various sales of the property, the country club was also reduced in size such that the lake feature is no longer part of the current club property. The club's use changed so that it is now focused only on the sport of golf.

The golf club property is associated with the development of early residential properties in the Chino Hills area on the lots adjacent to the golf course, which were originally purchased by club members. However, the lots were developed very slowly over the course of several decades. The sale of land for the development of homes was announced in 1926, but the neighborhood was less than half built 20 years later in 1946. It was not until about 1980 that the neighborhood appeared to be nearly built out. As stated in the Chino Hills General Plan (adopted February 2015), only 5 percent of the homes in the Los Serranos neighborhood predate 1945, and over 50 percent were built after 1970. Continued on page 9.

B10. Significance, continued:

Furthermore, the city of Chino Hills did not incorporate until 1991 following a period of extensive growth in the 1970s and 1980s. Therefore, while the country club made lots available for residential development early in the twentieth century, it cannot be said that the country club was a strong catalyst for the growth and establishment of the city of Chino Hills.

Lastly, research to date does not indicate that any events significant in our history have occurred at the golf club.

Consequently, the Los Serranos Golf Club does not appear eligible for listing in the NRHP under Criterion A or the CRHR under Criterion 1.

Criteria B/2 (Individuals)

Research to date has not demonstrated that the Los Serranos Golf Club is associated with the lives of persons important to local, state, or national history. The golf club property does not appear eligible under NRHP Criterion B or CRHR Criterion 2.

Criteria C/3 (Design/Construction)

The Los Serranos Golf Club does not appear to be eligible under Criteria C/3 as it does not embody the distinctive characteristics of a type, period, region, or method of construction, or represent the work of a master, or possess high artistic values. Due to numerous changes to the property, the club does not have a cohesive design. The extant clubhouse and maintenance building represent a contemporary Spanish Revival style from the buildings' remodeling in the early 1990s. Other buildings on the property such as the ancillary and snack bar buildings (constructed between circa the 1970s and 2000) do not have a clearly discernible style. As previously discussed, research to date does not indicate that Dunn, the golf course designer, is considered a master in his field. The original north course's configuration and features have been considerably altered as described above—the locations of Holes 1, 2, 5, 6, 16, 17, and 18 and the driving range have been changed, and a second course was built adjacent approximately 37 years after the original course was developed. Coupled with the changes to the golf course–related buildings, the north course does not retain integrity to convey its original design, construction, materials, workmanship, or feeling.

Criteria D/4 (Information Potential)

The potential to yield information important to prehistory or history is typically applied to archaeological resources, and these criteria were not applied to this evaluation of the Los Serranos Golf Club.

B12. References, continued:

American Society of Golf Course Architects. n.d. "Architect's Gallery." Available at https://tic.msu.edu/tgif/limiting?interface=archg. Accessed July 2022.

Antique Golf Clubs from Scotland. 2021. "John Duncan Dunn." Available at https://www.antiquegolfscotland.com/antiquegolf/maker.php3?makerid=666. Accessed July 2022.

Barrows, H.D. 1914. "The Lugo Family of California." *Annual Publications, Historical Society of Southern California*, Volume IX, 1912-1913-1914. Historical Society of Southern California, Los Angeles, California. Available at https://www.google.com/books/edition/The_Historical_Society_of_Southern_Calif/Rsg1AAAAIAAJ?hl=en&gbpv=1. Accessed July 2022.

California State Library. n.d. "Los Serranos C. Club, the club house # C-1". Photograph of Los Serranos Country Club clubhouse. Available at https://csl.primo.exlibrisgroup.com/permalink/01CSL_INST/hbrh2d/alma990014157230205115. Accessed July 2022.

Chino Champion. 1926a. "Los Serranos Club Sold to Syndicate of Members." August 10, 1926. Available at Newspapers.com. Accessed July 2022.

-----. 1926b. "Members Now Owners Los Serranos Country Club." August 20, 1926. Available at Newspapers.com. Accessed July 2022.

-----. 1926c. "Many Improvements at Los Serranos Country Club." September 17, 1926. Available at Newspapers.com. Accessed July 2022.

-----. 1927a. "Will Rebuilt Home." April 12, 1927. Available at Newspapers.com. Accessed July 2022.
-----. 1927b. "Plan To Improve At Los Serranos." November 8, 1927. Available at Newspapers.com. Accessed July 2022.
-----. 1937. "Take Home in Club Tract." May 21, 1937. Available at Newspapers.com. Accessed July 2022.
-----. 1948a. "Retired Army Officer Purchases Rancho Don Lugo Golf Course." April 23, 1948. Available at Newspapers.com. Accessed July 2022.
-----. 1948b. "Los Angeles Engineer and Wife Buys Rancho Don Lugo Club." June 25, 1948. Available at Newspapers.com. Accessed July 2022.
-----. 1953. "Paul Greening Buys Club from Clara Bartlett." June 11, 1953. Accessed July 2022. Newspapers.com

Chino Hills Champion. 1994. "Country club redo." August 25, 1994. Available at Newspapers.com. Accessed July 2022.

City of Chino Hills. n.d. "History." Available at https://www.chinohills.org/95/History. Accessed July 2022.
-----. var. Building permit records for Los Serranos Golf Club.
-----. 2015. General Plan. Adopted February 2015. Available at https://www.chinohills.org/DocumentCenter/View/11275/General-Plan---Final-approved-by-CC-2-14-15-4-21?bidId=. Accessed July 2022.
-----. 2022. "2021-2029 Planning Period Housing Element." Adopted February 8, 2022.

Colton Daily Courier. 1925. "Los Serranos County Club Opens Sunday." April 22, 1925. Available at Newspapers.com. Accessed July 2022.

Curtis, Charles. 1954. "Covina, Los Serranos Courses Take Shape." *Los Angeles Times*. February 28, 1954. Available at Newspapers.com. Accessed July 2022.

Goldstein, Richard. 2009. "Jack Kramer, 88, Champion, Promoter and Powerful Force in Tennis, Is Dead." *Los Angeles Times*. September 13, 2009. Available at https://www.nytimes.com/2009/09/14/sports/tennis/14kramer.html#:~:text=Jack%20Kramer%2C%20the%20Wimbledon%20and,cancer%2C%20his%20son%20Robert%20said. Accessed July 2022.

Golf. 2020. "Designers with the most credits in our Top 100 Courses in the U.S. ranking." November 3, 2020. Available at https://golf.com/travel/top-100-courses-us-architect/. Accessed July 2022.

Golf Club Atlas. 2004–2016. Discussion Thread: John Duncan Dunn. Available at: https://www.golfclubatlas.com/forum/index.php/topic,13078.0/nowap.html?PHPSESSID=8f5abb0089ba4ae0682f03514bb13532. Accessed July 2022.

Golf Digest. 2013. "America's 100 Greatest Golf Courses: By Architect." Available at https://www.golfdigest.com/gallery/top-100-golf-courses-by-architect. Accessed July 2022.

Golf Pass. 2022. "John Duncan Dunn." Available at: https://www.golfpass.com/travel-advisor/architects/1820-john-duncan-dunn/. Accessed August 2022.

Golfweek. 2021. "Golfweek's Best 2021: The top architects on the Modern, Classic Courses lists." Available at https://golfweek.usatoday.com/lists/golf-courses-golfweeks-best-2021-top-architects/. Accessed July 2022.

Google Earth. 2022. Aerial imagery of Los Serranos Golf Club and vicinity.

Long Beach Press. 1924. "Big Country Club To Use Ground Of Chino Home Ranch." February 10, 1924. Available at Newspapers.com. Accessed July 2022.

Long Beach Telegram. 1924a. "Davison and Associates Buy 750 Acres Near Chino For Country Club Project." January 13, 1924.
-----. 1924b. "Big Country Club to Use Ground of Chino Home Ranch." 10 February. Available at: https://www.newspapers.com/paper/press-telegram/26586/. Accessed July 2022. Available at Newspapers.com. Accessed July 2022.
-----. 1924c. "Famous Rancho Landmark Now a Country Club." February 17, 1924. Available at Newspapers.com. Accessed July 2022.

-----. 1924d. "Recall History of Early California In Visit To Chino." May 11, 1924. Available at Newspapers.com. Accessed July 2022.

Los Angeles Times. 1953a. "Rancher Buys Los Serranos Golf Course." June 18, 1953. Available at Newspapers.com. Accessed July 2022.
-----. 1953b. "Kramer Among Group Operating Chino Golf Links." October 17, 1953. Available at Newspapers.com. Accessed July 2022.

Los Serranos Golf Club. 1997. Dedication plaque for new clubhouse located inside the LSGC clubhouse.
-----. 2018a. "North course." Available at https://losserranosgolfclub.com/north-course/. Accessed July 2022.
-----. 2018b. "South course." Available at https://losserranosgolfclub.com/south-course/. Accessed July 2022.
-----. 2021. "History of Los Serranos." Available at https://losserranoscountryclub.com/history-of-los-serranos/. Accessed July 2022.

Mckinnon, Malcolm. n.d. "The Dunn Family and their influence on Golf Club Architecture and Golf in America." Springdale Golf Club, Princeton, New Jersey. Available at https://www.springdalegc.org/Files/Library/DUNNFAMILYII.PDF. Accessed July 2022.

Shumway, Burgess McK (Michael Burgess and Mary Wickizer Burgess, ed.). 2007. *California Ranchos,* second edition. The Borgo Press, San Bernardino, California.

Miranda, Michael (LSGC Tournament Director). 2022. Personal communication with Susan Zamudio-Gurrola, July 5, 2022.

Napoles, Marianne. 2018. "Houses pondered for Los Serranos Golf Course." Champion Newspapers. https://www.championnewspapers.com/news/article_af5ea642-ffdd-11e8-86b1-93a275bfc1bf.html

NETRonline. 1938-2020. Aerial imagery of Los Serranos Golf Club and vicinity. Available at www.historicaerials.com. Accessed July 2022.

Pomona Progress Bulletin. 1953. "Los Serranos Golf Club Property Sale Reported." June 8, 1953. Available at Newspapers.com. Accessed July 2022.
-----. 1954. "Nine Holes Will Open Soon at Los Serranos." February 4, 1954.

San Bernardino County Sun. 1953. "Los Serranos Country Club Sold, Golf Course to Be Closed Down." June 12, 1953. Available at Newspapers.com. Accessed July 2022.

San Bernardino Daily Sun. 1925. "Los Serranos Country Club Has Ideal Site for Sports; Old Hospitality Recalled." April 21, 1925. Available at Newspapers.com. Accessed July 2022.

Spitzzeri, Paul. 2018a. "Isaac Williams and the Rancho Santa Ana del Chino." March 24, 2018. Champion Newspapers. Available at https://www.championnewspapers.com/opinion_and_commentary/history_of_the_hills/article_bf925ce6-2eb6-11e8-a0ae-47c7ed4ae2b0.html. Accessed July 2022.

-----. 2018b. "The Chino Ranch and Joseph Bridger, 1865-1881." November 10, 2018. Champion Newspapers. Available at https://www.championnewspapers.com/opinion_and_commentary/history_of_the_hills/article_97f82e64-e436-11e8-bed4-7f27e4c2eed5.html. Accessed July 2022.

-----. 2018c. "Richard Gird: From Tombstone to Chino." December 8, 2018. Champion Newspapers. Available at https://www.championnewspapers.com/opinion_and_commentary/history_of_the_hills/article_18baabf2-fa59-11e8-84a0-6b149d26c42c.html. Accessed July 2022.

-----. 2018d. The Chino Ranch and Joseph Bridger, 1865-1881. Champion Newspapers, 10 November. Available at: https://www.championnewspapers.com/opinion_and_commentary/history_of_the_hills/article_97f82e64-e436-11e8-bed4-7f27e4c2eed5.html. Accessed July 2022.

-----. 2019a. "Boom to Bust at Chino Ranch." January 5, 2019. Champion Newspapers. Available at https://www.championnewspapers.com/opinion_and_commentary/history_of_the_hills_article_5eeca1f6-103a-11e9-9564-63ad14501082.html. Accessed July 2022.

-----. 2019b. "Chino Land and Water Company." Champion Newspapers, 13 April. Available at: https://www.championnewspapers.com/opinion_and_commentary/history_of_the_hills/article_63ea7d14-5d46-11e9-ac3b-2397f9b95c95.html. Accessed July 2022.

-----. 2020. "The Founding of Los Serranos Country Club, 1924-1925." July 11, 2020. Champion Newspapers. Available at https://www.championnewspapers.com/opinion_and_commentary/history_of_the_hills/article_5fdf692c-c2bd-11ea-9528-5f94d5845e3e.html. Accessed July 2022.

-----. 2021. "Los Serranos Country Club as an African-American haven, 1949." October 23, 2021. Champion Newspapers. Available at https://www.championnewspapers.com/opinion_and_commentary/history_of_the_hills/article_da1e0162-3350-11ec-b8c5-1f3b31a8467b.html. Accessed July 2022.

Top 100 Golf Courses. 2019. "Top 100 Golf Course Architects." Available at https://www.top100golfcourses.com/news-item/top-100-golf-course-architects. Accessed July 2022.

UCSB Library. 1935. Aerial photograph. Flight C-3668, Frame 50. Available at https://mil.library.ucsb.edu/ap_indexes/FrameFinder/. Accessed July 2022.
-----. 1937. Aerial photograph. Flight C-4542, Frame 44. Available at https://mil.library.ucsb.edu/ap_indexes/FrameFinder/. Accessed July 2022.
-----. 1946. Aerial photograph. Flight GS-CP, Frame 8-86. Available at https://mil.library.ucsb.edu/ap_indexes/FrameFinder/. Accessed July 2022.

Watson, Ryan. n.d. "The Most Influential Course Architects." Golf Link. Available at https://www.golflink.com/about_35530_most-influential-course-architects.html. Accessed July 2022.

Youngman, Randy. 2020. "California's Longest Holes and Courses." California Golf & Travel, April 2020. Available at https://issuu.com/calgolfnews/docs/cagolf_travel_april2020/s/10450537. Accessed July 2022.

P5a. Photo or Drawing, continued:



Photo 2. Clubhouse, N elevation, looking S.



Photo 3. Starter building, E and S elevations looking NW.



Photo 4. Maintenance building, N elevation, looking SW.



Photo 5. Ancillary building, E elevation, looking W.

P1. Other Identifier: Los Serranos Country Club

***P2. Location:** ☐**Not for Publication** ■ **Unrestricted** ***a. County:** San Bernardino

and (P2b and P2c or P2d. Attach a Location Map as necessary.)

***b. USGS 7.5' Quad:** Yorba Linda **Date:** 1981 (1982 edition) **T** 2S; **R** 8W**; ¼ of ¼ of Sec** (unsectioned), S.B. **B.M.**

c. Address: 1800 Carbon Canyon Road City: Chino Hills Zip: 91709

d. UTM: Zone mE / mN

e. Other Locational Data: APNs 103101140, 100005128, 103101166, 103101165.

***P3a. Description:**

The Western Hills Country Club is situated on multiple parcels totaling approximately 312 acres. Generally L-shaped, the country club includes a section oriented northeast-southwest parallel to Carbon Canyon Road, and a section oriented north-south. The southwestern end of the golf course extends to the west side of Canon Lane. The club includes an 18-hole course that is 6,746 yards long (Golf Link 2022), a driving range, putting green, clubhouse, golf cart and maintenance buildings, a swimming pool, and numerous paved paths. A paved parking lot, adjacent to and south of the clubhouse, is accessed from Fairway Drive where the entrance is marked by four brick pillars with black iron gates, and a post-mounted sign announcing the Western Hills Country Club. The golf course terrain is undulating, and features many mature trees and a small lake northwest of the clubhouse. The surrounding setting includes Eucalyptus Avenue and residential development to the north; Fairway Drive, residential development and open space to the east; Carbon Canyon Road, Chino Valley Fire Station No. 4, a golf cart shop, and residential development to the south; and residential development to the west. Continued on page 4.

***P3b. Resource Attributes:** HP39. Other – Golf Course

***P4. Resources Present:** ☐Building ☐Structure ☐Object ■Site ☐District ☐Element of District ☐Other (Isolates, etc.)

P5a. Photo or Drawing



P5b. Description of Photo:
Photo 1. Clubhouse, south façade, view from parking lot, facing north

***P6. Date Constructed/Age and Sources:** ■Historic ☐Prehistoric ☐Both
1963

***P7. Owner and Address:**
West Hills Golf Associates Ltd. (San Bernardino County Assessor)

***P8. Recorded by:**
Susan Zamudio-Gurrola
SWCA Environmental Consultants
51 W Dayton Street
Pasadena, CA 91105

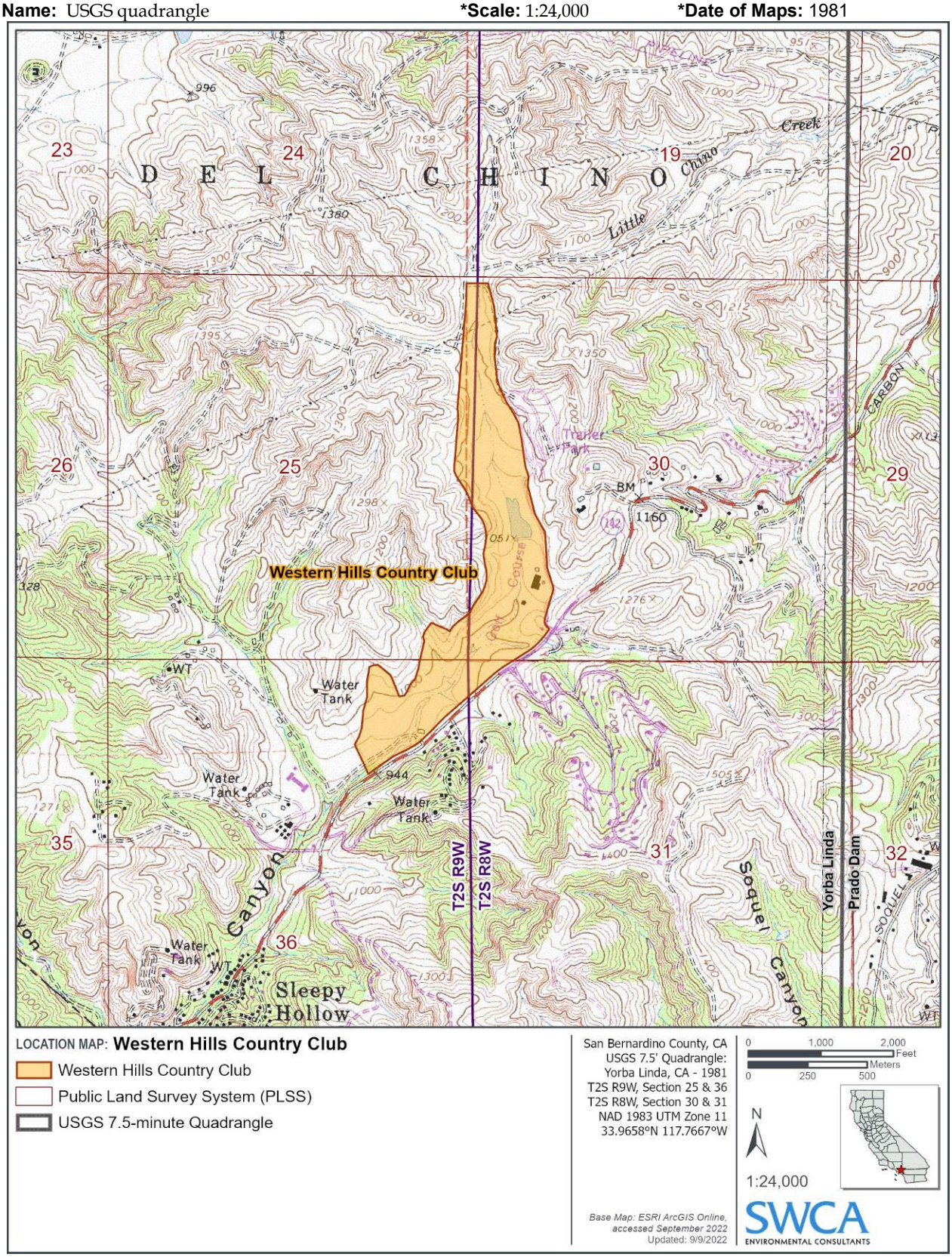
***P9. Date Recorded:** 7/5/2022

***P10. Survey Type:** Intensive

***P11. Report Citation:**
Zamudio-Gurrola, Susan, Denniston, Liz and Debi Howell-Ardila. 2022. Cultural Resources Technical Report for the Chino Hills General Plan Update, City of Chino Hills, California. Prepared for EcoTierra Consulting, Inc. and the City of Chino Hills. SWCA Environmental Consultants, Pasadena, California.

***Attachments:** ☐NONE ■Location Map ☐Sketch Map ■Continuation Sheet ■Building, Structure, and Object Record ☐Archaeological Record ☐District Record ☐Linear Feature Record ☐Milling Station Record ☐Rock Art Record ☐Artifact Record ☐Photograph Record ☐ Other (List):

***Map Name:** USGS quadrangle ***Scale:** 1:24,000 ***Date of Maps:** 1981



B1. Historic Name: Western Hills Golf and Country Club
B2. Common Name:
B3. Original Use: Country club B4. Present Use: Country club

***B5. Architectural Style:** The clubhouse building portrays a contemporary Spanish Revival style; the modest, masonry restroom building does not have a discernible style.

***B6. Construction History:** The country club was originally developed between 1962 and 1963 (*Chino Champion* 1963). The clubhouse was originally built as a stock show/sales barn in 1961, remodeled in 1963 to use as the clubhouse, and was partially demolished and remodeled again in 1988. The swimming pool and pool house building were built ca. 1964; the golf cart building was built in 1990; the construction date of the restroom building at the west end was not ascertained (*Chino Champion* 1988; City of Chino Hills, var.; NETRonline 1938-2020).

***B7. Moved?** ■No ☐Yes ☐Unknown **Date:** **Original Location:**

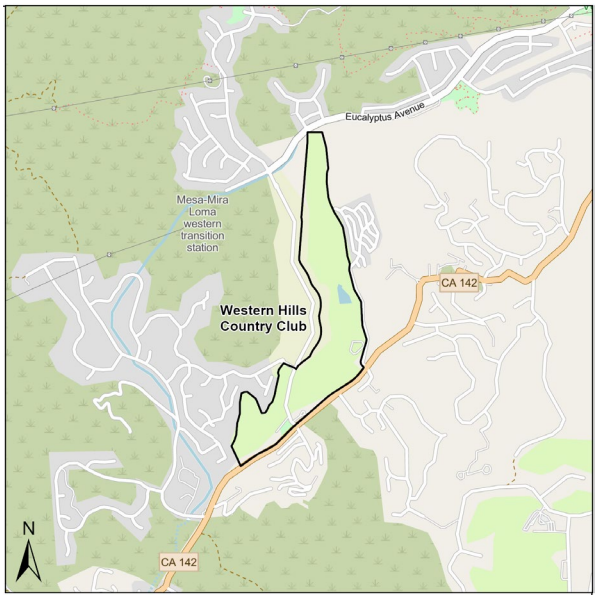
***B8. Related Features:**

B9a. Architect: Golf course architect – Harry Rainville b. Builder: Unknown

***B10. Significance: Theme:** Recreation **Area:** Chino Hills, California
Period of Significance: N/A **Property Type:** N/A **Applicable Criteria:** N/A

The Western Hills Country Club was opened in March 1963 on the lands of a former cattle ranch. Known as the "Double S Ranch," the property was owned by Shelley Martin Stoody and his wife Corrine Stoody. Mr. Stoody was known for his prized, expensive Hereford cattle (one of which he purchased in 1958 for $55,000); he also had a quarter interest in a bull valued at $320,000. In 1960, Stoody constructed a show ring and barn in which to display his cattle stock for sale. His property also included a landing strip, which was subsequently related to his cause of death in June 1961 when he died in a plane crash near his home. Three other passengers were also killed, and several damage suits were filed against Stoody's estate. The court authorized the sale of the ranch, and in 1963, it was purchased for $600,000 by a group of investors from surrounding cities who planned the development of a country club on a portion of the 380-acre property (*Chino Champion* 1961, 1963a, 1963c).

The group of investors included Delmar Pebley, president, William G. Claussen, vice president and acting manager, Dr. G. Barton Heuler, treasurer, and Dr. L. Kenneth Heuler, secretary. Opening in March 1963, the Western Hills Country Club included an 18-hole golf course, a driving range and a practice green near the clubhouse. Nine holes were sited along the canyon beside Carbon Canyon Road, and nine were sited in the valley running northward from the property entrance. Between the no. 10 and no. 18 fairways was a small lake. Stoody's approximately 14,500 sq. ft. cattle sale barn was renovated and converted into a clubhouse with a pro shop, control room, bar, kitchen, dining, banquet and locker rooms, and offices. Two hangars on the ranch property were also repurposed. A 40 ft. by 40 ft. hangar located near the clubhouse was used to store golf carts; a second 40 ft. by 60 ft. hangar was relocated near Carbon Canyon Road across from the Mountain View tract to store maintenance equipment. The landing strip and several buildings were removed, including a barn and two smaller buildings near the entrance. Additional amenities planned for the property included tennis, badminton and ping pong courts in support of the family-focused program of the country club (*Chino Champion* 1961, 1963a, 1963b, 1978). It is unknown if these features were built. A swimming pool was constructed east of the clubhouse shortly after the club opened (NETRonline 1938-2020). Continued on page 5.



B11. Additional Resource Attributes: (List attributes and codes)

***B12. References:** See continuation sheet, page 7.

B13. Remarks:

***B14. Evaluator:** Susan Zamudio-Gurrola, SWCA.
***Date of Evaluation:** July 14, 2022

(This space reserved for official comments.)

Recorded By: Susan Zamudio-Gurrola ***Date:** July 14, 2022 ■ Continuation ☐Update

P3a. Description, continued:

Clubhouse – The clubhouse was originally built as a stock show and sales barn in 1961, but was remodeled in 1963 to use as a clubhouse, and was partially demolished and remodeled again in 1988. Presently designed in a contemporary Spanish Revival style, the clubhouse is one story with high ceilings. It rests on a concrete foundation and generally has a rectangular footprint. The southern half of the building is covered by a flat roof edged by a hipped, tiled roof that conceals mechanical equipment. The northern half of the building is covered by a very low-pitched gabled roof which appears to be clad with composite shingles. The building exterior is sheathed in smooth stucco. An arcade with wide square piers spans the southern façade. At the eastern end of the façade, a gabled roof shelters the primary entrance which consists of steel arched double doors flanked by sidelights. Secondary doors are located on the west and north elevations. Fenestration consists of large steel-framed fixed windows, smaller sliding windows, and possibly awning or fixed windows on the north elevation (Photos 1 and 2).

Golf cart building – The golf cart building was constructed in 1990 north of the clubhouse near Fairway Drive. It has a rectangular footprint and a flat roof with composite shingles and numerous skylights. A concrete path surrounds the building on all sides.

Swimming pool – The swimming pool was constructed in circa 1964 east of the clubhouse, near Fairway Drive. It is an irregularly shaped swimming pool surrounded by a concrete path and patio, and grass lawn. The pool facility is enclosed by an iron rail fence (Photo 3).

Pool house/showers – The shower/pool house building was constructed in circa 1964 north of the pool. It has a rectangular plan and a medium-pitched, side-gabled roof clad with composite shingles. Although not clearly visible due to the pool security fencing, it appears to be sheathed in stucco, and has at least one vinyl-frame sliding window. The south elevation displays a recessed niche with a shower (Photo 4).

Restroom Building – The restroom building's construction date was not ascertained. The small building is located on the west side of Canon Lane, near the western end of the country club. The building has a rectangular footprint and a very low pitched gabled roof. Wide wooden fascia boards show considerable deterioration. The exterior walls consist of masonry blocks painted tan. Privacy screening walls shield the doorways to the restroom facilities inside (Photo 5).

Interior view of Stoody's show and sales barn which was converted into the country club's clubhouse in 1963



Source: Western Hills Country Club

Continued on page 5.

Recorded By: Susan Zamudio-Gurrola ***Date:** July 14, 2022 ■ Continuation ☐Update

B10. Significance, continued:

It appears the investor group later developed the Western Hills Mobile Homes Estates on the east side of Fairway Drive (*Chino Champion* March 24, 1978). A portion of the undeveloped ranch property to the north and west of the country club was sold for construction of a housing tract (Spitzzeri 2014).

Sparse data was available to trace the ownership history of the property over the decades – city building permit records redact owner information for privacy reasons. A general partnership was identified in association with the Western Hills Country Club in 1986 which consisted of T.W. Dutton and George D. Voigt of Upland, Jacob Y. Terner of Beverly Hills, and Robert D. Dutton of Ontario (*Chino Champion* 1986).

Jacob Y. Terner was born in New York in 1934. He married Sandra Wolloch, obtained his M.D. in 1961, and practiced in New York until 1966 when he entered the military, serving until 1968. Afterwards, Jacob and his family moved to Los Angeles where he founded a private practice pathology group. He also founded and ran several business entities, and taught at the University of Southern California School of Medicine (Legacy.com 2022). George D. Voigt was born in 1932 in Upland, California. T.W. Dutton was born in 1930 in Rancho Cucamonga, California. Robert D. Dutton was born in 1950 in Ontario. No consequential information was found on Voigt or either Dutton.

The country club was acquired in March 1987 by Western Hills Golf Associates, who completed improvements to the property and remodeled the clubhouse (*Chino Champion* 1988). The clubhouse was partially demolished by removing the pro shop, restaurant, bar, and banquet room, then enlarged by approximately 1,000 square feet. The kitchen was moved, a larger bar and grill room was created, the locker rooms and banquet room were refurbished, and views to the outdoors were improved. Additionally, as part of the remodel, the building exterior was redesigned to give it a "California Spanish look" (*Chino Champion* 1988).

Additional improvements were completed at the property shortly thereafter. A garage near the clubhouse (likely the former ranch building near the clubhouse that had been repurposed to store golf carts) was demolished in 1989. A new golf cart storage building was constructed by the following year at the same location north of the clubhouse. Other work conducted on the property in the 1990s included: walls built at the perimeter of the property; remodeling of the locker area; and installation of a new fuel tank at the maintenance building. Work conducted in the 2000s included: repairs to a damaged portion of the north locker room wall; electrical work for the pond and irrigation system; installation of a prefabricated structure to house cell-site equipment; and installation of a sewer line (City of Chino Hills, var.).

The clubhouse undergoing partial demolition for its expansion and remodel in 1988



Source: Chino Champion 1988

Continued on page 6.

B10. Significance, continued:

In circa 2001, West Hills Golf Associates Ltd. coordinated with the City of Chino Hills to have Fairway Drive accepted into the city-maintained street system in exchange for waterline easements through the country club property, and a 1.2-acre parcel given to the city for a park at Carbon Canyon Road and Cannon Lane (City of Chino Hills 2018). It appears the property owner has remained the same; the San Bernardino County Assessor lists the present owner as West Hills Golf Associates, Ltd. which was formed in 1987 (San Bernardino County Assessor-Recorder-Clerk 2022; Dun & Bradstreet 2022).

Architect/Designer

Harry Rainville, a golf course architect based out of Yorba Linda, designed the country club's 18-hole golf course (*Chino Champion* March 21, 1963). Rainville was born in 1905 in St. Onge, South Dakota. Research conducted for this study did not uncover consequential information on Rainville. He worked on the design of golf courses in various California cities, as well as on several projects with his son David Rainville who continued practicing golf course architecture into the 2000s (American Society of Golf Course Architects 2022). Harry died in 1982 (GolfPass 2022).

As part of the research undertaken for this study, several sources were consulted to review rankings of golf course architects/designers, including Top 100 lists, and those identifying influential golf course architects/designers. These sources included the American Society of Golf Course Architects Architect's Gallery database, Golf magazine, Golf Digest, Golf Link, and Golfweek. Harry Rainville was not identified in any of the sources consulted. Research to date does not indicate he was associated with any significant golf course designs or considered a master in his field.

National Register of Historic Places/California Register of Historical Resources Evaluation:

Criteria A/1 (Events)

Developed in the early 1960s, Western Hills Country Club was relatively late in the trend of recreational development in the Chino Hills area. Research to date does not indicate that any significant events in national, state or local history have taken place on the property, nor is the property associated with any significant trends or patterns of national, state, regional or local history. The property is not a significant example in the context of golf courses across the city, state or nation. Therefore, the country club does not appear eligible for listing under Criteria A/1.

Criteria B/2 (Individuals)

Research to date has not indicated the Western Hills Country Club is associated with persons that are important to local, state or national history. The property does not appear eligible under Criteria B/2.

Criteria C/3 (Design/Construction)

The Western Hills Country Club was developed in 1963 on the lands of a former cattle ranch. While a few of the ranch buildings were repurposed for the country club, the majority of the ranch's buildings and features were removed and altered. Those former ranch buildings reused at the country club (the clubhouse and golf cart building) were later demolished in the 1980s. The extant clubhouse reflects a contemporary Spanish Revival style from its latest remodel (and partial demolition) in the 1980s, and other buildings such as the masonry restroom building and pool house building are utilitarian with no clear discernible style. Research to date on Harry and David Rainville did not indicate that they are considered masters in the field of golf course architecture, and the golf course itself is not representative of a significant or distinctive golf course design. Consequently, the property does not appear eligible for listing under Criteria C/3.

Criteria D/4 (Information Potential)

The potential to yield information important to prehistory or history is typically applied to archaeological resources and is not applied to this evaluation of the Western Hills Country Club.

Continued on page 7.

Recorded By: Susan Zamudio-Gurrola ***Date:** July 14, 2022 ■ Continuation ☐Update

B12. References, continued:

American Society of Golf Course Architects and Michigan State University Libraries. 2006. "David Rainville." Available at https://asgca.org/architect/drainville/. Accessed July 2022.

Ancestry. 2022. U.S., City Directories, 1822-1995. Available at Ancestry.com. Accessed July 2022.
2022. U.S., Public Records Index, 1950-1993, Volume 1. Available at Ancestry.com. Accessed July 2022.

Chino Champion. 1961. "3 Die In Plane Crash Here." June 29, 1961. Available at Newspapers.com. Accessed July 2022.
-----. 1963a. "Golf Course." January 10, 1963. Available at Newspapers.com. Accessed July 2022.
-----. 1963b. "New Western Hills Golf Club At Carbon Canyon Summit is Opened." March 21, 1963. Available at Newspapers.com. Accessed July 2022.
-----. 1963c. "Chino Rancher In Fatal Plane Accident Leaves Large Estate." October 3, 1963. Available at Newspapers.com. Accessed July 2022.
-----. 1978. Fictitious Business Name Statement for Western Hills Mobile Homes Estates. March 24, 1978. Available at Newspapers.com. Accessed July 2022.
-----. 1986. Fictitious Business Name Statement for Western Hills Mobile Homes Estates. November 21, 1986. Available at Newspapers.com. Accessed July 2022.
-----. 1988. "Western Hills sprucing up." February 5, 1988. Available at Newspapers.com. Accessed July 2022.

Chino of Chino Hills. Var. Building permits for Western Hills Country Club.
-----. 2018. Letter to City Council regarding: Dedication of Fairway Drive. Regular Meeting Date August 14, 2018. Available at https://agendaquick.chinohills.org:8086/agenda_publish.cfm?id=&mt=ALL&get_month=3&get_year=2022&dsp=agm&seq=780&rev=0&ag=110&ln=4646&nseq=781&nrev=0&pseq=782&prev=0#ReturnTo4646. Accessed July 2022.

Dun & Bradstreet. 2022. "West Hills Golf Associates, Ltd." Available at https://www.dandb.com/businessdirectory/westhillsgolfassociates-chinohills-ca-19363093.html. Accessed July 2022.

Golf Link. 2022. "Western Hills Golf Course." Available at https://www.golflink.com/golf-courses/ca/chino-hills/western-hills-golf-country-club. Accessed July 2022.

GolfPass. 2022. "Harry Rainville." Available at www.golfpass.com. Accessed July 2022.

Legacy.com. 2022. "Jacob Y. Terner M.D." Obituary. Available at Legacy.com. Accessed July 2022.

NETRonline. 1938-2020. Aerial imagery of Western Hills Country Club and vicinity. Available at historicaerials.com. Accessed July 2022.

San Bernardino County Assessor-Recorder-Clerk. 2022. Parcel data for parcel numbers 102101166000, 1031011400000, and 1000051280000. Available at https://arcpropertyinfo.sbcounty.gov/. Accessed July 2022.

Spitzzeri, Paul. 2014. "Oil Drilling in Carbon Canyon's Chino Hills Portion, Part Two." Carbon Canyon Chronicle. July 29, 2014. Accessed July 2022. http://carboncanyonchronicle.blogspot.com/2014/07/oil-drilling-in-carbon-canyons-chino_29.html

Continued on page 8.

P5a. Photo or Drawing, continued:



Photo 2. Northern half of clubhouse, N elevation, looking SW



Photo 3. Swimming pool adjacent to clubhouse, looking NE

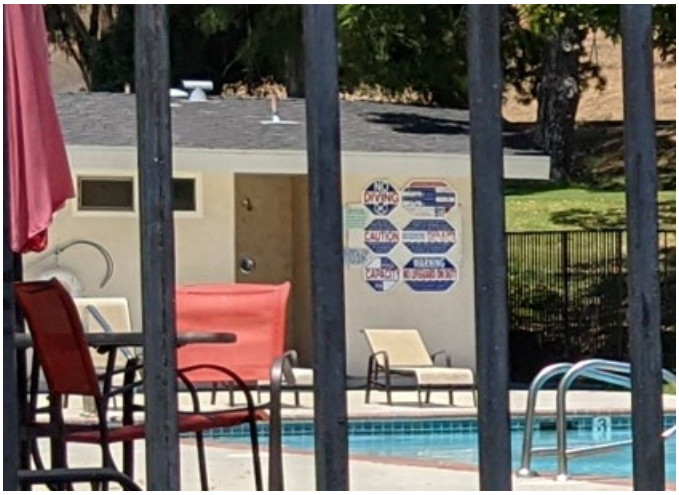


Photo 4. Pool house, S elevation, looking NE



Photo 5. Restroom building on course, E elevation, looking NW



Photo 6. Overview of course, looking NW

APPENDIX K: GEOLOGY REPORT

Geotechnical Conditions Update For
City of Chino Hills General Plan

Prepared For
CITY OF CHINO HILLS

May 10, 2022

GMU Project No. 22-017-00

23241 Arroyo Vista
Rancho Santa Margarita | CA 92688
949.888.6513 | FX: 949.888.1380 | www.gmugeo.com

TRANSMITTAL

CITY OF CHINO HILLS
14000 City Center Drive
Chino Hills, CA 91709

DATE: May 10, 2022

PROJECT: 22-017-00

ATTENTION: Ms. Joann Lombardo

SUBJECT: Geotechnical Conditions Update, City of Chino Hills General Plan

DISTRIBUTION:

Addressee: electronic copy, 3 hard copies

23241 Arroyo Vista
Rancho Santa Margarita | CA 92688
949.888.6513 | FX: 949.888.1380 | www.gmugeo.com

TABLE OF CONTENTS

Description Page

INTRODUCTION 1
PURPOSE 1
LOCATION 1
SCOPE 1
EXISTING GENERAL PLAN 2
PREVIOUS GEOTECHNICAL STUDIES 2
GENERAL PLAN UPDATE 2
CHAPTER 1: LAND USE ELEMENT 2
Overlay Classifications 2
CHAPTER 4: CONSERVATION ELEMENT 2
Mineral Resources 2
CHAPTER 5: SAFETY ELEMENT 3
INTRODUCTION 3
BACKGROUND INFORMATION AND ISSUES IDENTIFICATION 3
Seismic Hazards 3
Vulnerabilty of the City of Chino Hills to Seismic Hazards 14
Issues and Opportunities – Seismic Hazards 16
Geologic Hazards 19
Issues and Opportunities – Geologic Hazards 24
Flood and Inundation Hazards 26
Issues and Opportunities – Flood and Inundation Hazards 30
Hazardous Materials 31
Goals, Objectives and Policies 31
CLOSURE 33
REFERENCES 34

TABLE S-1 – Modified Mercalli Intensity Scale
TABLE S-2 – Earthquake Faults and Magnitudes

TABLE OF CONTENTS (CONTINUED)

Description

PLATES

PLATE S-1 – Active & Potentially Active Faults
PLATE S-2 – Chino Hills July 2008 Earthquake Epicenter Map
PLATE S-3 – Seismic Hazards Fault Rupture
PLATE S-4 – Liquefaction Susceptibility Seismically Induced Landslide Hazard Zones
PLATE S-5 – Canyons in the City of Chino Hills
PLATE S-6 – Landslide Susceptibility
PLATE S-7 – Expansive Soils
PLATE S-8 – Flooding and Inundation Hazards
PLATE S-9 – FEMA Flood Map
PLATE S-10 – Oil Fields in the Chino Hills Area

INTRODUCTION

PURPOSE

This geotechnical report is intended to provide a baseline geotechnical conditions update to be used in the preparation of the planned City of Chino Hills General Plan update.

LOCATION

The City of Chino Hills is located in the southwestern portion of San Bernardino County, California. The City is bordered by Riverside County to the southeast and Orange County on the west.

SCOPE

The scope of our geotechnical studies, as outlined in our proposal dated October 29, 2022, was as follows:

1. Reviewed and analyzed published regional seismic and geologic maps, reports, and documents published after 2011 for seismic and geologic hazard potential within the City of Chino Hills. The data and conclusions obtained during our research and analysis have been used to update pertinent sections of the General Plan including:

    a. Seismic Safety Overlay for the Land Use Element;
    b. Mineral Resources Discussion for the Conservation Element;
    c. Safety Element (including seismic hazards, geologic hazards, flooding, and oil and mineral production).

2. Prepared this geotechnical report as a summary of our research and analysis for inclusion into the planned City of Chino Hills General Plan update.

It should be noted that this report is limited to a generalized overview of the geotechnical conditions within the City of Chino Hills. No field exploration or laboratory testing was performed, nor research pertaining to the possible presence of toxic or hazardous materials within the limits of the City of Chino Hills.

EXISTING GENERAL PLAN

PREVIOUS GEOTECHNICAL STUDIES

The most recent update of the City of Chino Hills General Plan was adopted in February 2015. The relevant sections reviewed and updated as part of this report include Chapter 1 - Land Use Element, Chapter 4 - Conservation Element; and Chapter 5 - Safety Element. Applicable portions of the General Plan that require updating are presented below.

GENERAL PLAN UPDATE CHAPTER 1: LAND USE ELEMENT

CHAPTER 1: LAND USE ELEMENT

Overlay Classifications

Seismic Safety Overlay

A Seismic Safety overlay was previously identified adjacent to the trace of the Chino Hills fault, as described in detail within the Safety Element, Chapter 5.

CHAPTER 4: CONSERVATION ELEMENT

Mineral Resources

The Chino Hills area has produced oil since the late 1800s and minor oil production continues in the Chino-Soquel Oil Field and the Mahala Oil Field as discussed in the Safety Element.

According to the California Geological Survey (CGS), no significant mineral deposits are known to exist in Chino Hills. Outside the corporate boundary in the southeastern portion of the city, CGS has classified the sand and gravel resources along the Santa Ana River Wash as Mineral Resource Zone 2 (MRZ-2), which is defined as an area where adequate information indicates that significant mineral deposits exist or are highly likely. The majority of this area lies within Chino Hills State Park.

CHAPTER 5: SAFETY ELEMENT

INTRODUCTION

The geological environment of Southern California and the Chino Hills area present a number of natural hazards that could potentially endanger the safety of the public. Numerous active and potentially active earthquake faults traverse Southern California, causing seismic hazards such as ground shaking to be potentially hazardous events. The city also contains a number of hillsides with slopes in excess of 25 percent. This steep topography, combined with area soil conditions, makes landslides and other slope instabilities potential geologic hazards. Additional natural hazards that could affect the city include flooding due to natural disasters or dam inundation.

BACKGROUND INFORMATION AND ISSUES IDENTIFICATION

This section describes in detail the hazards that might affect the City of Chino Hills as well as the resources that are available in the event of an emergency. This element examines seismic, geologic, flood and inundation, fire and hazardous material hazards. This background information provided the base data to create the goals and policies which direct decision makers on how to manage safety concerns.

The following sections discuss potential seismic hazards that might influence development of building or other civil works within the City of Chino Hills. The figures that are provided are intended as a guide to assist in determining if a particular geologic hazard may impact a site within the City. The figures are not intended to be a substitute for site-specific geologic and engineering investigations for planning, design, or construction of a particular project.

Seismic Hazards

Earthquakes occur when planes of weakness, called faults, in the Earth's crust move past one another. Southern California is located on a boundary of two tectonic plates, the North American Plate and the Pacific Plate, causing the area to be considered seismically active. Numerous faults considered active or potentially active have been mapped in Southern California, including in the vicinity of and within the City of Chino Hills (Petersen et. al, 1996). Earthquakes on faults can trigger several geologic phenomena that can cause severe property damage and loss of life. These hazards include ground shaking, fault rupture, liquefaction and associated hazards, subsidence, and seiches (waves in enclosed bodies of water). Earthquakes can also cause a variety of localized, but not less destructive hazards, such as urban fires, dam failures, and release of toxic chemicals. The City of Chino Hills could be impacted by any or all of these hazards.

Earthquakes are normally classified as to the severity of their magnitude or their seismic intensity. Magnitude is defined as a measure of the amount of energy released when a fault ruptures: it is generally measured using seismographs. Seismic intensity is defined as a qualitative estimate of the damage caused by an earthquake at a given location. Because the amount of destruction generally decreases with increasing distance away from the epicenter (a point at the ground surface directly above the origin of an earthquake), earthquakes are assigned several intensities. The most commonly used seismic intensity scale, called the Modified Mercalli Intensity (MMI) Scale, has 12 levels of damage. Higher numbers on the MMI Scale indicate greater damage at the area of interest (see attached Table S-1). The intensity of seismic ground shaking at any given site is a function of several factors, but primarily the magnitude of the earthquake, the distance from the epicenter to the area of concern, the type of geologic material between the epicenter and the site, and the topographic conditions of the site. The amount of damage is also controlled to a certain extent by the size, shape, age, and engineering characteristics of the affected structures. Most buildings in Chino Hills are of wood-frame construction, which while not immune to structural damage, is notably resilient to earthquake shaking, particularly when designed per current Building Codes.

Ground Shaking

The City of Chino Hills is located within close proximity of several active and potentially active faults that are capable of generating moderate to strong ground motions during earthquakes (Hart, 1999). These moderate to strong ground motions could result in damage to buildings and other civil works within the City. The location of active and potentially active earthquake faults capable of generating moderate to strong earthquake ground motions are illustrated in Figure S-1. The seismologic characteristics of these faults are summarized in Table S-2. The Uniform California Earthquake Rupture Forecast version 2 (UCERF2) utilizes two different earthquake magnitudes to model various fault rupture scenarios and earthquake ground motions (WGCEP, 2008). These two magnitudes are presented in Table S-2. Data presented in version 3 of the Uniform California Earthquake Rupture Forecast (Field et. a., 2015), does not revise the magnitudes presented in Version 2. The location of historical earthquakes with magnitudes greater than 4.0 within the zone of influence of the City are illustrated on Figure S-2 and presented in Table S-2 where the causative fault is known.

The geologic and seismologic characteristics of major faults anticipated to influence performance of buildings and other civil works within the City are discussed below.

<u>Chino Fault</u>

The Chino fault is considered a northern splay of the Elsinore Fault Zone (Treiman, 2002). The Chino fault extends approximately 21 kilometers southeast through the City of Chino Hills toward the City of Corona where it joins the Elsinore Fault Zone near the southern terminus of Main Street in Corona. Available geologic mapping, paleoseismic studies and oil well data

indicate the Chino fault trends northwest to southeast and dips approximately 50 to 70 degrees toward the southwest. The sense of fault displacement along the Chino fault is predominantly right-lateral, strike-slip: however, some early geologic mapping and recent paleoseismic studies suggest a reverse sense of movement at some locations. Several recent geologic studies of the Chino fault have revealed Holocene fault displacement (i.e., during the last 11,000 years). The California Geological Survey re-evaluated the Chino fault in 2002 as a result of these recent findings and has zoned the Chino fault as active pursuant to the guidelines of the Alquist-Priolo Earthquake Fault Zone Act. Two historic earthquakes are attributed to the Chino fault: the February 16, 1989 magnitude 3.2 strike-slip earthquake that occurred at a depth of approximately 4.3 kilometers and the December 14, 2001 magnitude 3.9 strike-slip earthquake that occurred at a depth of approximately 13.8 kilometers (Hauksson and Jones, 1991; Treiman, 2002).

The Elsinore Fault Zone

The Elsinore fault extends for approximately 200 kilometers from near the border with Mexico to its northern terminus near Whittier Narrows (Figure S-1). The Uniform California Earthquake Rupture Forecast version 3 (UCERF 3) lists four fault segments within the Elsinore fault zone. These segments are the Whittier, Glen Ivy, Temecula and Julian segments, from north to south (Field et. al, 2013). The Uniform California Earthquake Rupture Forecast version 2 (UCERF 2) identifies a fifth segment, the Coyote Mountains segment. The Whittier segment exhibits a reverse, right-lateral oblique sense of movement while the Glen Ivy, Temecula, Julian, and Coyote Mountains segments exhibit a right-lateral, strike-slip sense of movement (Cao et al., 2003).

Whittier Segment (W)

The Whittier segment of the Elsinore fault extends approximately 25 to 30 kilometers from the Whittier Narrows south to the Santa Ana River. Changes in fault geometry between the Whittier segment and the Glen Ivy segment to the southeast define the boundary between these two segments. The changes in fault geometry include a gradual 20 degree bend to the northwest from approximately N50W along the Glen Ivy segment to approximately N70W and a change in dip of the fault plane from approximately 80° southwest along the Glen Ivy segment to 70-75° northeast along the Whittier segment (Wills et. al., 2008). Radiocarbon dating of charcoal collected during paleoseismic trenching studies of the Whittier segment of the Elsinore fault estimate the most recent earthquake event occurred between approximately 1400-2200 years ago (Patterson and Rockwell, 1993).

Glen Ivy Segment (GI)

The Glen Ivy segment of the Elsinore fault is located between the southern end of the Whittier segment near Corona and Lake Elsinore where a releasing stepover separates the Glen Ivy segment from the Temecula segment to the south. The Glen Ivy segment of the Elsinore fault is

approximately 40 kilometers in length. The most recent earthquake event along the Glen Ivy segment occurred May 15, 1910 and produced approximately 25 cm of slip along the Glen Ivy segment based on offset of a cultural feature (Rockwell, 1989). Paleoseismic studies along the Glen Ivy segment suggest that some earthquake events prior to the May 15, 1910 earthquake have produced larger amounts of fault slip.

Temecula Segment (T)

The Temecula segment extends for a distance of approximately 50 kilometers between the stepover at the southern end of the Glen Ivy segment to a compressional uplift at Agua Tibia Mountain. This compressional uplift occurs at a bend in the Elsinore fault geometry. The bend at Agua Tibia Mountain forms the boundary between with the Julian segment to the south. The most recent earthquake event along the Temecula segment occurred between A.D. 1655 and A.D. 1810 (Dawson et al., 2008). Radiocarbon dating of samples collected from fault trenches and the historic record at the Pala Mission reveal four paleoseismic events occurred between 2,700 years ago and just before 4,500 years ago along the Temecula segment of the Elsinore fault at Agua Tibia (Vaughan et al., 1999).

Julian Segment (J)

The Julian segment extends for a distance of approximately 65-75 kilometers south from the compressional uplift at Agua Tibia Mountain to an extensional left step between the Julian and Coyote Mountains segments near the Tierra Blanca Mountains. The Julian segment is the longest segment of the Elsinore Fault Zone. Although the paleoseismic record along the Julian segment is limited to two earthquake events, the available data suggest the most recent earthquake event along the Julian segment occurred approximately 1,500 years ago to 2,000 years ago based on the results of trenching at Lake Henshaw and near Julian (Magistrale and Rockwell, 1996; Thorup, 1997). The available paleoseismic data suggest earthquake events occur less frequently along the Julian segment than other segments of the Elsinore fault (Dawson et al., 2008).

Coyote Mountains Segment (CM)

The Coyote Mountains segment extends approximately 30-35 kilometers south from the extensional left step between the Julian and Coyote Mountains segments near the Tierra Blanca Mountains. The southern end of the fault is defined by a releasing step with several northeast-trending cross faults that separate it from the Laguna Salada fault (Dawson et al., 2008). Paleoseismic studies of the Coyote Mountains segment suggest that three earthquake events have occurred within the last 2,000 years (Rockwell, 1990; Dawson et al., 2008).

San Jose Fault

The San Jose fault is located north of the City and extends approximately 20 kilometers from south side of the San Jose Hills northeast to near Claremont (Figure S-1). Available data suggests the fault dips steeply to the north with a reverse sense of fault displacement (i.e., north side up). The California Department of Water Resources indicates that the San Jose fault is well defined based on the presence of a groundwater barrier and suggests that the San Jose fault offsets "older alluvium" approximately 100 meters in the subsurface. However, Holocene deposits are not offset by the fault (CA DWR, 1970), indicating there has not been any Holocene activity.

Puente Hills Blind Thrust (PHT)

The Puente Hills Blind Thrust (PHT) is a north dipping thrust that extends approximately 40 kilometers east across the Los Angeles basin from downtown Los Angeles to Brea. A blind thrust fault is a buried fault, the surface of which does not break the surface. The fault is manifested at the surface by series of folds above the fault surface including the Montebello Hills and west and east Coyote Hills. The fault is subdivided into three segments: Los Angeles, Santa Fe Springs, and Coyote Hills (Shaw et al., 2002). Dolan et al. (2003) document at least four large earthquakes (i.e., magnitude 7.2 to 7.5) in the past 11,000 years. The 1987 M6.0 Whittier Narrows earthquake occurred on the Puente Hills Thrust (Shaw and Shearer, 1999).

Sierra Madre-Cucamonga Fault Zone

The Sierra Madre-Cucamonga Fault Zone is located along the boundary between the southern margin of the San Gabriel Mountains and the northern portions of the San Fernando and San Gabriel valleys (Figure S-1). The Sierra Madre-Cucamonga Fault Zone extends approximately 95 kilometers from near Interstate 405 in the San Fernando Valley to Lytle Creek. The Sierra Madre-Cucamonga Fault Zone is a major reverse fault in southern California. Historic fault rupture occurred along approximately 19 kilometers of the Sierra Madre-Cucamonga Fault Zone between about Big Tujunga Canyon and Dunsmore Canyon during the February 9, 1971 M6.4 San Fernando Earthquake (Crook et al., 1987; Rubin et al., 1998). Holocene fault rupture has been documented along the eastern portion of the fault zone from approximately San Antonio Creek to Lytle Creek.

San Jacinto Fault Zone

The San Jacinto fault zone is located east of the City of Chino Hills and is one of the most seismically active faults in California. The fault zone extends approximately 250 kilometers from the area near Cajon Pass where the San Jacinto fault joins the San Andreas fault south to the Imperial Valley. This fault has a right-lateral, strike-slip sense of movement (Cao et al., 2003).

The San Jacinto fault zone is divided into eight segments based on fault geometry, historical seismicity, and slip rate data. The segments of the San Jacinto fault zone are: San Bernardino Valley, San Jacinto Valley, Anza/Clark, Coyote Creek, Borrego Mountain, and the sub-parallel Superstition Mountain and Superstition Hills segments (WGCEP, 1988; Dawson et al., 2008).

San Bernardino Valley Segment (SBV)

The San Bernardino Valley segment extends approximately 35 to 40 kilometers from the northern terminus of the San Jacinto fault zone at the San Andreas fault to the northern San Jacinto Valley. Paleoseismic studies of the San Bernardino Valley segment at the Walnut trench site suggest that six earthquake events have occurred within the approximately 1,000 year long interval between 3,000 and 4,000 years ago. Fault trenches excavated at a site near Colton, California suggest that two earthquakes have occurred within about the last 300 years (Fumal and Kendrick, 2008).

San Jacinto Valley Segment (SJV)

The San Jacinto Valley segment begins at a restraining bend at the northern end of the San Jacinto Valley and extends approximately 40 to 45 kilometers from along the east side of the Hemet releasing stepover. The Casa Loma fault located on the west side of the releasing stepover is part of the Anza segment. There are no paleoseismic data available to identify paleo-earthquake events or the age of the most recent surface rupture event on this segment of the San Jacinto fault. However, the fault has been a source of significant earthquakes during the historic period (Dawson et al., 2008). Two significant earthquakes occurred in 1899 (M6.9) and 1918 (M 7.1) that were located on or near the San Jacinto Valley segment (Bakun, 2006). The timing of the most recent event is uncertain for this segment of the fault because surface rupture was not documented for either of these earthquakes. However, surface rupture could have occurred along the Claremont section of the fault because this fault strand was not investigated following the 1918 earthquake (Rasmussen, 1982).

Anza/Clark Segment (A)

The Anza/Clark segment extends south from the Hemet releasing stepover for a distance of approximately 110 kilometers. The southern 50 kilometers of the Anza segment is also known as the Clark fault. This section of the fault parallels the Coyote Creek segment to the west. The area between the Clark section and the Coyote Creek segment includes numerous cross faults and other structures that accommodate slip between these two segments of the San Jacinto fault. Paleoseismic data obtained from the Hog Lake trench site reveals at least 16 paleo-earthquake events have occurred during the past 3,500 to 4,000 years ago. The most recent earthquake event along the Anza/Clark segment occurred between approximately 1750 and 1800 A.D. (Rockwell et al., 2006).

Coyote Creek Segment (CC)

The Coyote Creek segment is approximately 40 kilometers long and is located west of and parallel to the Clark section of the Anza/Clark segment discussed above. The southern end of the Coyote Creek segment is located at the northern terminus of the rupture zone associated with the 1968 Mw 6.5 Borrego Mountain earthquake. No paleoseismic data regarding paleo-earthquakes or recurrence interval are available for this segment (Dawson et al., 2008).

Borrego Mountain Segment (BM)

The Borrego Mountain segment is defined by the extent of faulting rupture observed after the 1968 Mw6.5 Borrego Mountain earthquake. The 1968 Mw6.5 Borrego Mountain earthquake ruptured approximately 31 kilometers of the San Jacinto fault. A maximum of 38 cm of right-lateral surface offset was recorded after this earthquake.

Superstition Mountain Segment (SM)

The Superstition Mountain segment of the San Jacinto fault zone extends south for a distance of approximately 24 kilometers from the southern end of the 1968 Borrego Mountain rupture to the end of the mapped trace (Gurrola and Rockwell, 1996; Cao et al., 2003). The Superstition Hills fault is located east of and sub-parallel to the Superstition Mountain fault and extends approximately 13 kilometers farther south than the Superstition Mountain segment. The Superstition Hills fault is the southern-most mapped trace of the San Jacinto fault zone (Dawson et al., 2008). No paleoseismic data regarding paleo-earthquakes or recurrence interval are available for this segment (Dawson et al., 2008).

<u>San Andreas Fault Zone</u>

The San Andreas fault extends southeast from where the fault joins the Kings Range Thrust and Mendocino Fault Zone approximately 1,300 kilometers to the Gulf of California. The San Andreas fault is one on the most active faults and has the highest measured slip rate in California. The San Andreas fault is the only known source of Magnitude 8 earthquakes in southern California. The predominant sense of movement along the San Andreas fault is right-lateral, strike-slip (Weldon et. al., 2008). The San Andreas fault has been subdivided into the northern and southern sections. In southern California, the fault zone has been divided into 10 segments: the Parkfield (PK), Cholame (CH), Carrizo (CC), Big Bend (BB), Mojave north (NM), Mojave south (SM), San Bernardino north (NSB), San Bernardino south (SSB), San Gorgonio- Garnet Hill (BG), and Coachella (CO) (Wills, et al., 2008). Only the southern nine fault segments from the Cholame segment south have a significant influence on seismic hazards in the city.

Ground Shaking Discussion

The city is located within a seismically active area of southern California and may be subject to future strong ground shaking on near- and/or far-field sources. Earthquake shaking is likely the seismic hazard with the greatest potential risk to loss of life and/or property within the city. The loss of life and/or property can be reduced by designing projects in accordance with the most recent versions of building codes and standards like the California Building Code (CBC) and the American Society of Civil Engineers Standard (ASCE) No. 7-Latest Adoption.

Although a great deal is known about where earthquakes are likely to occur, there is currently no reliable way to predict when an earthquake will occur in any specific location. Scientists study the past frequency of large earthquakes in order to determine the future likelihood of similar large earthquakes. Based on the number of historic earthquakes and known active faults in the vicinity of the city, ground shaking will affect the city again in the future (WGCEP, 1995). The eastern portion of the city is underlain by alluvial sediments that may be saturated. These sediments would likely be subject to ground amplification (ground shaking is typically less severe on rock than on alluvium) in the event of an earthquake occurring on one of the major active faults in the vicinity of the city including the Elsinore, Chino, Puente Hills, San Jacinto, San Andreas, or Cucamonga faults.

The historic record of moderate to strong earthquakes in southern California extends back to the Mission era (late 18th century). There have been approximately 10 historic earthquakes with magnitudes greater than approximately 5 that have resulted in moderate to strong damaging earthquake ground motions in the vicinity of the city. Historical earthquakes are described in the following paragraphs.

1812 Wrightwood Earthquake

An estimated magnitude 7.5 earthquake occurred on the morning of December 8, 1812, along the San Andreas fault in the Wrightwood area. The earthquake ruptured approximately 105 miles of the ground surface. Forty Native Americans were killed at Mission San Juan Capistrano while attending mass when the church collapsed.

1857 Fort Tejon Earthquake

One on the largest earthquakes ever recorded in the United States occurred on January 9, 1857, along the southern San Andreas fault. The 1857 Fort Tejon earthquake was estimated at a magnitude of 8.0. The earthquake ruptured approximately 220 miles of the San Andreas fault from Cholame on the north to the Cajon Pass area on the south. Offset along the fault rupture resulted in an average fault offset of approximately 15 feet and a maximum of approximately 30 feet near Wallace Creek on the Carrizo Plain. Strong ground shaking caused by the earthquake was reported to have lasted for more than one minute.

1899 Cajon Pass Earthquake

An estimated magnitude 5.7 earthquake occurred on July 22, 1899 in the area of Cajon Pass. The earthquake occurred on an unknown fault somewhere near Lytle Creek and Cajon Pass. This earthquake triggered landslides that blocked Lytle Creek Canyon Road and the road through Cajon Pass. Damage to buildings was reported in San Bernardino and Highland.

1987 Whittier Narrows Earthquake

The magnitude 6.0 Whittier Narrows earthquake occurred at approximately 7:42 AM on October 1, 1987. The Whittier Narrows earthquake occurred along the Puente Hills Blind thrust (Shaw and Shearer, 1999). The earthquake caused three direct fatalities and over $358 million in damage (Hauksson et al., 2008). The ShakeMap data reveal Modified Mercalli Intensity (MMI) shaking up to approximately MMI VII or VIII in the epicentral region (Hauksson, 1994). ShakeMap data generated by the United States Geological Survey (USGS) indicate MMI shaking between approximately MMI V to MMI VI in the vicinity of the City of Chino Hills.

1988 and 1990 Upland Earthquakes

On June 26, 1988, a magnitude 4.6 earthquake occurred along the San Jose fault, about 2 miles (3 kilometers) northwest of the City of Upland. The earthquake caused minor damage in the epicentral area. On February 28, 1990, a magnitude 5.2 earthquake occurred along the San Jose fault in the same area. This earthquake caused landsliding in the Mount Baldy area, and it caused some damage to the San Antonio dam. Thirty-eight people sustained minor injuries and damage was considerable near the epicenter (Hauksson and Jones, 1991).

1991 Sierra Madre Earthquake

On June 28, 1991, a magnitude 5.8 earthquake occurred along a 4 kilometers segment of the Clamshell-Sawpit fault north of the City of Monrovia, approximately 26 miles (41 kilometers) northwest of the City of Chino Hills. The earthquake caused substantial damage in communities of the northern San Gabriel Valley. The ShakeMap data generated by the USGS reveal Modified Mercali Intensity (MMI) shaking up to approximately MMI VII in the epicentral region (Hauksson, 1994). ShakeMap data in the vicinity of the City of Chino Hills indicate MMI shaking between approximately MMI V to MMI VI.

1992 Landers and Big Bear Earthquakes

At 4:57 AM on June 28, 1992, the magnitude 7.3 Landers earthquake struck in the Desert Region near the communities of Yucca Valley, Joshua Tree, and Landers. The earthquake produced a 53-mile (85 kilometer) long surface rupture extending from about 9 miles (15 kilometers) south of Yucca Valley to about 25 miles (40 kilometers) north of Landers. Ground surface

rupture occurred along several faults including the Johnson Valley fault, the Landers fault, the Homestead Valley fault, and the Camp Rock-Emerson faults. The average slip on the ground surface rupture was 10 to 13 feet (3 to 4 meters) with a maximum slip of about 20 feet (6 meters). The epicenter of the earthquake was located about 3.5 miles (6 kilometers) north of the community of Yucca Valley. ShakeMap data in the vicinity of the City of Chino Hills indicate MMI shaking between approximately MMI V to MMI VI.

Approximately 3 hours later, at 8:05 a.m., the magnitude 6.4 Big Bear earthquake struck in the mountains near Big Bear. The Big Bear earthquake occurred on a separate, previously unknown northeast trending left-lateral strike-slip fault that intersects the Camp Rock-Emerson faults. It appears that the Big Bear earthquake was triggered by movement on the Camp Rock-Emerson faults during the Landers Earthquake. The Big Bear earthquake did not produce a surface rupture and no trace of the fault with the proper orientation has been found. Collectively the quakes caused one death, over 400 injuries, and around $100 million in damage to property, roads, and water systems.

1994 Northridge Earthquake

The magnitude 6.7 Northridge earthquake occurred at approximately 4:30 AM on January 17, 1994. The Northridge earthquake occurred along the Northridge Blind Thrust located beneath the San Fernando Valley (Huftile and Yeats, 1996). The earthquake caused $35 billion in damage (Shaw and Shearer, 1999). ShakeMap data in the vicinity of the City of Chino Hills indicate MMI shaking up to approximately MMI VI.

1999 Hector Mine Earthquake

On October 16, 1999, a magnitude 7.1 earthquake ruptured portions of the Lavic Lake and the Bullion faults. The earthquake rupture was approximately 25 miles long and produced approximately 16 feet of right-lateral offset. The earthquake was centered approximately 34 miles northwest of Twentynine Palms, California. The ShakeMap data generated by the USGS reveal MMI shaking between approximately MMI IV to MMI V in the vicinity of the City of Chino Hills.

July 29, 2008 Unnamed Earthquake

A magnitude 5.4 earthquake occurred on July 29, 2008, with an epicenter located approximately 3.9 miles southwest of Chino Hills City Hall. Although damage was minimal, strong ground shaking was felt widely throughout southern California. The earthquake occurred at a depth of approximately 15 kilometers. Two aftershocks with M>3 occurred in the following two hours. The mainshock and aftershock sequence occurred at a depth between 13 to 16 kilometers between the Whittier and Chino faults. It is unclear from the available data which fault is the causative fault due to the limited aftershock distribution (Hauksson et al., 2008). The earthquake

intensity data available at the ShakeMap website indicate the strongest shaking was recorded in the Diamond Bar area north of the City of Chino Hills. The ShakeMap data reveal MMI shaking varied between approximately MMI V to MMI VI in the City of Chino Hills.

Surface Fault Rupture

The potential for surface fault rupture exists in the city along the trace of an active or potentially active fault. The potential for surface fault rupture to impact life or property in the city is associated with the Chino fault (Figure S-3). Although the Chino fault has not ruptured within historic time, the paleoseismic studies reveal the fault has experienced surface fault rupture within the Holocene period (i.e., approximately the last 11,000 years). The California Geological Survey (CGS) established an Alquist-Priolo Earthquake Fault Zones around the Chino fault on May 1, 2003. A generalized map illustrating the Chino fault and Alquist-Priolo Earthquake Fault Zone is presented on Figure S-3. The Alquist-Priolo Earthquake Fault Zone map for the Chino fault is only intended to serve as a guide in determining the general locations of earthquake fault zones and is not suitable for local planning and site selection. It should be noted that the Alquist-Priolo Earthquake Fault Zone map may not be up-to-date since the CGS frequently updates maps as new data becomes available.

The Alquist-Priolo Earthquake Fault Zones map can be reviewed at:

- Department of Conservation/California Geological Survey, Southern California Regional Office, 320 West 4th St., Suite 850, Los Angeles, CA 90013, Phone: 213-239-0878
- City of Chino Hills Community Development Department, 14000 City Center Drive, Chino Hills, CA91709
- https://maps.conservation.ca.gov/cgs/informationwarehouse/index.html?map=regulatorymaps

Electronic versions of Alquist-Priolo Earthquake Fault Zones maps in both PDF or GIS formats can be requested from:

- Department of Conservation/California Geological Survey, Southern California Regional Office, 320 West 4th St., Suite 850, Los Angeles, CA 90013, Phone: 213-239-0878
- https://maps.conservation.ca.gov/cgs/informationwarehouse/index.html?map=regulatorymaps

Liquefaction

Liquefaction is a soil strength and stiffness loss phenomenon that typically occurs in loose, saturated cohesionless soils as a result of strong ground shaking during earthquakes (Pradel, 1998; Pyke, 2003; Youd et. al, 2001). The potential for liquefaction at a site is usually determined based on the results of a subsurface geotechnical investigation and the groundwater conditions beneath the site. Hazards to buildings associated with liquefaction include bearing capacity failure, lateral spreading, and differential settlement of soils below foundations, which can contribute to structural damage or collapse (Seed, 1979; Seed and Idriss, 1971; Tokimatsu and Seed, 1987).

The California State Legislature passed the Seismic Hazards Mapping Act (SHMA) in 1990 (Public Resources Code Division 2, Chapter 7.8) as a result of earthquake damage caused by the 1987 Whittier Narrows and 1989 Loma Prieta earthquakes. The purpose of the SHMA is to protect public safety from the effects of strong ground shaking, liquefaction, landslides, or other ground failure, and other hazards caused by earthquakes (CGS SP117). The majority of the City of Chino Hills is not mapped within a seismic hazard zone based on review of currently published maps available on the CGS website. However, review of the CGS website indicates that seismic hazard zone mapping of the City of Chino Hills is planned in the future.

Portions of the city may be underlain by loose, saturated alluvial materials subject to liquefaction. Areas considered most susceptible to liquefaction include the low-lying areas in the eastern portion of the city within the Chino Basin and canyon areas in Chino and eastern Puente Hills, as shown on Figures S-4 and S-5. Development of sites within these areas should include site-specific liquefaction studies as part of a geotechnical engineering investigation. At a minimum, the liquefaction studies should be performed in accordance with the most recent versions of CGS SP117 and the Southern California Earthquake Center Guidelines for Implementation of SP117.

Vulnerability of the City of Chino Hills to Seismic Hazards

Most injuries and property damage from a major earthquake impacting the city will be caused by strong ground motion, especially structural and non-structural damage to buildings. The City of Chino Hills is developed mostly into low-density and medium-density residential zones. Less extensive areas are devoted to low-rise commercial development. Low-rise buildings (less than three stories) common in the city are more likely to be damaged by an earthquake on a nearby source, such as the Chino or Whittier fault segments.

Residential Development

The wood-frame construction used in the residential and some commercial development in the city generally performs well during earthquakes. These buildings may experience significant structural and non-structural damage, but rarely collapse. However, wood-frame structures with split-level or irregular floor plans can be subject to torsional racking of foundation and wall elements during earthquakes of intensities of MMI = VIII or greater. Split-level houses are also susceptible to damage caused by the weakness of pole platforms or structures used to support the structure. Vertical changes in strength are termed "soft-stories" and are also manifested in other types of construction.

Single-family residences built before the 1952 Building Code was implemented are more likely to slip off their foundations as a result of strong ground motion associated with near-field earthquakes. Mobile homes are also susceptible to slipping off their foundations and should be secured.

Commercial and/or Industrial Development

Buildings using tilt-up concrete walls are found in some commercial development in Chino Hills. Roof collapse has been observed in some pre-1971 commercial buildings using this type of construction. Concrete and steel-framed buildings are more earthquake-resistant forms of commercial construction and should be encouraged. Unusual architectural features such as long spans, minimal amount of interior shear walls, or irregular shapes may also be found in commercial development and should be viewed with caution as they may be more susceptible to damage during an earthquake.

Critical Facilities

Critical facilities must remain operational after an earthquake; facilities that pose unacceptable risks to public safety if severely damaged are also of critical concern. Essential facilities, such as hospitals, fire and police stations, emergency centers, and communication centers, are needed during an emergency. High-occupancy facilities, such as churches and multi-family residential complexes, as well as dependent care facilities, such as schools, and senior living facilities, are also considered critical facilities and should be designed and prepared as such.

It is important to ensure that critical facilities designed for human occupancy possess no structural weaknesses that can lead to collapse. It should be noted that the State of California has jurisdictional responsibility to ensure that public schools are adequately constructed to seismic standards (Field Act, 1933; Garrison Act, 1969).

Any multi-story development or development of critical facilities planned to be constructed in the city should be built to the latest Building Code specifications and any additional criteria

stipulated by pertinent governing agencies and should include site-specific seismic hazard analyses per current State requirements, particularly for areas identified as having moderate to high susceptibility to liquefaction, as shown on Figure S-4.

Unreinforced Masonry Buildings

There are no known unreinforced masonry structures in the City of Chino Hills (Winston Ward, personal communication, 2022).

Nonstructural Hazards

Nonstructural damage is perhaps the largest expected source of injury in an earthquake. Buildings with exterior non-structural details such as cornices and parapets pose hazards to the public if not properly secured. Toppled furniture, interior equipment and decor items pose additional hazards. In structures where continued function is necessary (i.e., critical facilities such as fire stations and City Hall), special efforts should be made to ensure that communication equipment and emergency generators are not damaged during an earthquake.

Issues and Opportunities – Seismic Hazards

1. The primary seismic hazard in the City of Chino Hills is severe ground shaking as a result of an earthquake on any of several nearby seismically active faults. The simultaneous occurrence of earthquake-induced landslides, fire, isolated structural damage and impaired utility service caused by strong ground motion require adequate emergency response plans.

2. A magnitude 6.8 earthquake on the Chino fault could generate seismic intensities in the VIII to IX range on the MMI Scale within the city. This earthquake would cause the most damage in the eastern parts of the city, adjacent to the Chino fault, and in other low-lying areas susceptible to liquefaction. This fault also poses a potential surface rupture hazard.

3. A magnitude 7.3 earthquake on the Whittier segment of the Elsinore fault zone could generate seismic intensities in the VII to VIII range in the city. This earthquake would impact the western portions of the city.

4. The San Jacinto fault is considered to be one of the most seismically active faults in the region. Ground accelerations generated by this fault zone should be considered in planning and design of future developments within the city. Additional faults listed in Table S-2 should also be considered in accordance with current Building Codes and industry standards for seismic hazard analyses.

5. The seismic design and constructions standards contained in the California Building Code (CBC) should be applied to any conventional development in the city. Site-specific geologic

and seismic studies need to be conducted prior to the design and construction of a critical facility.

6. New construction within the city should adhere to safe design practices. Coordination between the property owner, architect, and structural engineer should be ongoing during the design process to eliminate design flaws. City building inspectors should review critical facilities and high-occupancy residential and commercial projects with consideration to the following:

    a. Symmetrical, concrete, and steel-framed commercial buildings have greater resistance to earthquake damage and should be encouraged.
    b. Irregularly shaped buildings are more difficult to design to withstand strong ground motions and are therefore more susceptible to damage during an earthquake and should be discouraged.
    c. Buildings with adverse discontinuities in strength between major structural elements, such as soft-story buildings, have increased susceptibility to earthquake damage and should be discouraged.
    d. Commercial pore-cast tilt-up construction must have adequate diaphragms (the horizontal bracing system that transmits horizontal forces to vertical-resisting components) and adequate tie-ins or connections between structural components to prevent roof collapse.
    e. Non-structural elements must not block exit routes or constrain rescue operations if damaged or unseated during an earthquake.
    f. Stairways and elevators should be adequately strengthened and nonstructural components such as emergency generators, computers and furniture should be anchored or braced.

7. Earthquake damage to wood-frame, single-family residential structures from near-field sources is expected to be slight to moderate and limited to walls thrown out of plumb, fallen chimneys, and torsional racking of foundation and wall elements. Houses built prior to 1952 and mobile homes may not be adequately anchored and could experience shifting off their foundations during an earthquake. Information regarding the benefits and procedures for correcting structural and nonstructural hazards in private dwellings should be made available as part of a voluntary seismic upgrading program.

8. The city should consider conducting a structural inventory of pre-1973 commercial facilities in the city to identify possible design weaknesses such as soft-story structures or tilt-up concrete construction. It is understood that very few older commercial structures exist in the city (Winston Ward, personal communication, 2022).

9. The Chino fault along the eastern portion of the City of Chino Hills has been identified as an Alquist-Priolo Special Studies Zone (CGS, 2003). Any proposed development within the limits of the Special Studies Zone should comply with the requirements of the Alquist-Priolo Earthquake Fault Zoning Act. Other faults associated with the Chino fault, or the Whittier segment of the Elsinore fault zone, should also be considered active.

10. Fault zones should be clearly identified on parcel maps to increase public awareness of fault rupture hazards.

11. Several areas along Chino Creek and in the canyon bottoms that drain the city may have a moderate to high susceptibility to liquefaction. Site-specific studies to address the potential for liquefaction should be required for new construction projects in the city.

12. The Chino Valley Independent Fire District operates three fire stations in the City of Chino Hills. These are located at 5551 Butterfield Ranch Road, 16231 Canon Lane, and 13707 Peyton Avenue. It is possible only emergency response personnel on duty at the time of a significant earthquake will be available during the first 6 hours, with mission capability possible in 24 hours (San Bernardino County Fire, 2018). Simultaneous evacuation of high-occupancy structures and the occurrence of earthquake-induced fires in the city could tax the Fire District's manpower resources.

13. Water pipelines can be damaged by surface rupture, liquefaction, landslides, or high-frequency seismic waves if significant vertical or horizontal displacements of the ground occur (O'Rourke and Lane, 1989). Breaks in water distribution pipelines can result in significant reductions in water pressure that can negatively impact post-earthquake fire suppression efforts. Water reservoirs in the city are generally adequate to provide at least a two-day supply of water (City of Chino Hills, 2022). Lake Los Serranos, Arnold Reservoir, other smaller ponds and swimming pools in the city can also be used as water sources for fire-suppression if necessary.

14. Electricity for the City of Chino Hills is provided by Southern California Edison. High frequency ground motions associated with a near-source earthquake can seriously disrupt the electricity supply network (Hayes, 1987; Toppozada et al., 1988). In the event of a major earthquake in the area, residents should be prepared to be without electricity for at least 24 hours with service possibly not fully restored for thirty days or more (San Bernardino County Fire, 2018).

15. Damage to computer switchboards and disruption to electricity will impair emergency communications. Landline and cellular telephone systems may be overwhelmed after an earthquake. Emergency response facilities should be equipped with radio equipment capable of monitoring several frequencies. It is estimated that these radio systems will operate at about 80% effectiveness for the first 12 hours after an earthquake (City of Chino Hills,

2020). These can serve as temporary communication links with similarly equipped facilities in the area.

16. Damaged natural gas pipelines and connections may result in service disruption and possibly fire. Information about how to shut off domestic gas supply should be made available to residents. The City of Chino Hills offers Emergency Preparedness Tips on the website at https://www.chinohills.org/49/Preparedness-Tips.

17. The potential for earthquake-induced hazardous materials accidents in the city and adjacent areas must be addressed in disaster planning scenarios for the City of Chino Hills. Hazardous materials issues are discussed further in the City of Chino Hills Hazard Mitigation Plan (2020).

Geologic Hazards

The City of Chino Hills is located in the eastern Puente Hills, in the northern portion of the Peninsular Ranges geomorphic province. The Peninsular Ranges province is characterized by a series of northwest to southeast-oriented valleys, hills, and mountains separated by faults associated with, and parallel to, the San Andreas fault system (Norris and Webb, 1990). Two of these faults, the Chino fault and the Whittier segment of the Elsinore fault system, are located within or close to the city of Chino Hills. These faults and the geologic units that underlie the city of Chino Hills generally control the potential geologic impacts discussed below.

The hilly portions of Chino Hills are underlain primarily by bedrock of the Puente Formation (Morton and Miller, 2006). This bedrock formation was deposited between 6 to 11 million years ago during a period when the area was submerged under the ocean. Approximately 2 to 3 million years ago, the continent began to rise and the ocean dropped, while a complex process of faulting and folding caused the uplift of the Puente Hills area and the city of Chino Hills. The bedrock materials of the Puente Formation have been folded and faulted within the Puente Hills such that bedding inclinations now range from gentle to steeply dipping (i.e., 10 to 70 degrees) with numerous folds of varying scales and axis orientations. In its entirety, it is estimated the Puente Formation is approximately 13,000 feet thick within the Chino Hills area.

The Puente Formation is divided into three members within the city of Chino Hills: the Sycamore Canyon member, Yorba member, and Soquel member (Morton and Miller, 2006). The Sycamore Canyon member of the Puente Formation, the youngest member, generally consists of thickly bedded sandstone and pebbly conglomerate with lesser amounts of siltstone and siliceous siltstone. The Yorba member generally consists of predominately thinly bedded siltstone, sandy siltstone, and siliceous siltstone, with scattered to rare claystone beds. The Soquel member, the oldest member of the formation, generally consists of well-bedded graded sandstone with interbedded siltstone.

The Topanga Formation is exposed within the southeastern portion of the city, adjacent to the Horseshoe Bend area of the Santa Ana River, within the Chino Hills State Park. The Topanga Formation was deposited about 15 million years ago, and generally consists of massively bedded sandstone and conglomerate with interbeds of siltstone and minor claystone. In addition to outcropping in the southeastern portions of the city, the Topanga Formation generally underlies the Puente Formation in the Chino Hills area.

Surficial sediments overlie bedrock in the lower portions of the city, particularly within canyons and at the eastern base of the Chino Hills. These sediments include very old alluvial soils to recent alluvial soils, slopewash and channel deposits, as well as landslide deposits. These sediments have been deposited over the past 2 million years as ancient stream channels have eroded the Chino Hills to their current topographic expression. Generally, the older surficial deposits are semi-consolidated, and consist of sands and silts with some clay. Younger surficial deposits may consist of coarser materials and are generally unconsolidated. Landslide deposits are generally comprised of the source materials that failed, such as bedrock or weak surficial soils on slopes.

Landslides and Slope Instability

A landslide is defined as a mass of rock or soil that has been displaced downslope by sliding, flowing, or falling. Slope failures can occur very rapidly on steep slopes or imperceptibly slowly on gentle slopes. Very slow movement of slopes is often called “slope creep” and is common on manufactured slopes and natural steep slopes. Factors that influence the stability of a slope include the characteristics of the rock and soil materials that make up the slope, moisture conditions, rainfall intensity, steepness of the terrain, geologic structure, and human influences (such as irrigation, grading, etc.).

The bedrock of the Puente Formation is often intensely fractured and folded and, therefore, relatively weak. Most large landslides in the Puente Hills area are thought to have occurred between 10 to 20 thousand years ago, when the regional climate was significantly wetter than today (Fife, et al, 1976; Tan, 1988). These landslides can be in delicate equilibrium with their environment and can be reactivated during periods of intense rainfall, if subjected to strong ground motions during an earthquake, or as a result of slope modifications by either man-made or natural conditions.

Increased water content in a slope can contribute to slope instability by increasing the weight of the soil materials on the slope, by softening planes of weakness such as bedding planes or faults, or by increasing the pressure exerted by water in the pores of the soil (pore pressure). Excessive rainfall or irrigation can saturate the soils on a slope, contributing to slope failure. Water introduced to a slope as a result of broken water or sewer lines or natural flooding can also cause slope instability problems. In general, water is the dominant trigger of slope failures and landslides.

Slope modification as a result of road construction and urban development can also render slopes unstable due to adverse geologic conditions. Many of the slopes in the Chino Hills area could be rendered unstable during or after grading due to exposure of adverse geologic conditions including folded or faulted bedrock. Failures are particularly likely on slopes underlain by the Yorba and Sycamore Canyon members of the Puente Formation (Yerkes, 1972; Tan, 1988). In order to mitigate this potential hazard, detailed geotechnical studies must be conducted prior to development in hilly portions of the city. These geotechnical studies should be completed per applicable Code and State standards as well as current geotechnical industry standards.

The results of the geotechnical studies should be utilized to modify the grading plans to mitigate unstable slope conditions and stabilize any existing landslides or unstable slopes.

In order to identify and evaluate the potential for landsliding within the city, a relative landslide susceptibility map for Chino Hills is provided as Figure S-6, based on the work of Tan (1988). The slopes within the city are classified into four susceptibility areas, as described on the figure, ranging from least susceptible to most susceptible (Areas 1 through 4, Figure S-6), and are based on the following criteria:

1. The occurrence and distribution of landslides and features indicative of slope instability;
2. Geology of the area including bedrock type, engineering properties of the bedrock materials as they relate to slope instability, and data on bedding, folding, and faulting; and
3. The relative behavior of the slopes within the area based on a review of aerial photographs and field observations.

Given that these mapping classifications are based on regional data, site-specific investigations are still necessary to determine potential slope instability problems for proposed developments. Development projects must identify and address landslide susceptibility as a condition of project approval in landslide hazard areas or as required by the City Geologist, including site-specific stability analyses and reports for all slopes, staff review of slope instability areas shown on seismic or geologic maps or other in-house data, and/or staff field checks. Due to the potential relationship between seismic activity and landsliding effects, the City shall require that a seismic analysis be included as a part of landslide stability studies when required by the Engineering Department.

Earthquake-Induced Landsliding

Earthquake-generated strong ground motions can worsen existing unstable slope conditions. Typical earthquake-induced landslides in the terrain of the Chino Hills area could include rotational slumps, rock falls, shallow slumps, and slides commonly associated with moderate to steep road cuts and natural slopes. If the slope materials become saturated, strong ground

motions could also trigger mudslides and mudflows. Properly designed and constructed engineered slopes will generally perform well during an earthquake.

Storm-Induced Landsliding and Erosion

Heavy rainfall often triggers surficial sliding (debris flows and mudflows) along the sides of canyons and on steep slopes. Hill slopes composed of Puente Formation blanketed with topsoil and colluvium are more susceptible to erosion if not properly planted.

The current California Building Code (CBC, 2019) provides guidelines that may reduce the potential for erosion of cut and fill slopes, including appropriate plantings, slope maintenance and construction of erosion control devices. Older hillside areas of the city developed prior to implementation of the current CBC may not have benefited from such protection, and consequently could experience a greater likelihood of storm damage.

Natural canyons and other hillside undeveloped areas may be susceptible to storm-induced landsliding and erosion. Downslope developments or those that may be impacted by these events should be designed with appropriate erosion control and/or debris catchment devices in order to minimize damage to developments.

Subsidence from Groundwater Withdrawal

Ground subsidence resulting from groundwater extraction has been documented at several locations in California, including the Chino-Riverside, Bunker Hill-Yucaipa, and Temecula areas (Lofgren, 1971; Shlemon and Hakakian, 1992). Subsidence in these regions has typically occurred over broad areas where groundwater levels have declined as much as 150 feet over a period of decades. Ground subsidence generally occurs where deep alluvial valleys exist. Alluvium-filled canyons in the Chino Hills area generally contain less than 200 feet of alluvium overlying consolidated bedrock of the Puente Formation. Therefore future subsidence due to groundwater withdrawal is not anticipated to occur in the City of Chino Hills (Lofgren, 1971).

Collapsible and Expansive Soils

Soils can collapse or expand for a variety of reasons, including the type of soil or presence of water. Low-density soils such as recently deposited river sediments can settle if subjected to the heavy loads associated with building foundations. These soils may also settle if compacted during an earthquake when water is extruded from the soil as a result of strong ground-shaking, and the particles are compressed together.

Granular soils, such as sands and gravel held together by clay or another water-soluble binder, can compact or densify if the clay is washed away by infiltrating water. This process is called hydrocompaction. The change in volume that results when soils densify can cause extensive damage to building foundations, infrastructure (such as roads, bridges etc.) and utilities. Therefore, potentially compressible soils need to be identified during the preliminary geological investigations for a proposed project or development so that mitigation measures can be selected and applied. The sandy alluvial deposits located within the major drainages traversing the City of Chino Hills may be susceptible to consolidation and hydrocompaction. Bedrock of the Puente Formation generally has a low settlement potential.

Soil settlement can also occur in the eastern side of the city in the area where clay was previously mined. If the open pits left behind from the clay mining operation are backfilled with fill soils that are not compacted under the supervision of a geotechnical engineer, settlement could occur.

Expansive soils are soils with a significant amount of montmorillonitic clay, a mineral that has the ability to shrink and swell as the water content changes (Mathewson, 1981). When changes in the environment result in a change in the moisture content of these clays, the soils change volume. Changes in volume of these soils can be brought on by seasonal changes in rainfall or changes in irrigation. Vegetation, especially large trees planted near a foundation, can also cause significant changes in soil volume as the trees withdraw water from the surrounding soil. Poor drainage around a structure can also result in localized swelling. The change in soil volume brought about by these processes can cause extensive damage to structures built over these soils. Differential expansion or settlement along the edges of a building foundation can also cause extensive structural damage. In the United States, expansive soils cause more damage in dollars to highways, streets and buildings than other natural disasters such as earthquakes, floods, and tornadoes combined (Mathewson, 1981).

Most surface soils in the City of Chino Hills have a moderate to low shrink-swell potential (Woodruff and Brock, 1980). However, some soils formed in place from weathering of clay-rich units of the Puente Formation have a high shrink-swell potential. The distribution of these surface soils in the city is shown on Figure S-7. The Puente Formation locally contains layers of volcanic ash that weather to highly expansive clays. These ash layers could be exposed during grading. To mitigate the hazards posed by soils with a high shrink-swell potential, geotechnical studies should be conducted on a site-by-site basis to evaluate the expansion potential of the soils at or near the proposed grade of a project.

Reactive Soils

Reactive or corrosive soils have chemical properties that can disintegrate or corrode metal pipes and concrete. Corrosive soils include soils with either low (less than 3) or high (greater than 9) pH values and low resistivity, and soils rich in sulfates. Soils with high concentrations of sodium, magnesium, or calcium sulfate can react chemically with the hydrated lime in cement and

disintegrate permeable concretes that have a high water-to-cement ratio. Geotechnical engineers routinely conduct sulfate analyses of soils as part of geotechnical investigations. The impact of sulfate-rich soils on concrete can be mitigated by using special cement mixes that include additives to reduce the permeability of the concrete and by paying careful attention to the mix design, quality control, and curing of the concrete. Soils in the Chino Hills area generally are potentially corrosive to ferrous metals and severely corrosive to concrete (L. Bates, personal communication, 2022). The city currently (2020) requires a soils analysis for corrosion prior to installation of water lines, sewer mains, or storm drains. Special design and materials must be used where corrosive soils exist.

Issues and Opportunities – Geologic Hazards

This section summarizes principal issues and offers suggestions for future actions, as listed below:

1. Geologic hazards in the city of Chino Hills are controlled to a large extent by the types of rock that underlie the area. Bedrock of the Puente Formation comprises most of the hilly portions of the city. This formation has units within it that are characteristically weak and therefore prone to landsliding. Four landslide susceptibility zones have been identified within city limits.

2. In general, the landslides mapped within the city are, at present, in equilibrium with the surrounding environment. However, these landslides could be reactivated as a result of any natural or man-made processes, such as development of hillsides, earthquake-induced strong ground motion, and periods of intense rainfall.

3. Development projects that involve grading of hillsides should be planned so as to disturb the natural landforms as little as possible. It is City policy to control the overall shape, height, and grade of cut and fill slopes so that manufactured landforms are in concert with existing natural contours while preventing conditions that result in landsliding, runoff, or erosion.

4. Good grading design must balance safety and aesthetics to preserve the natural visual quality and community character. Mitigation of existing and/or potential slope problems at the site and tract level should be recommended by qualified and licensed geotechnical engineers and engineering geologists and should be based on detailed site-specific information and current grading codes.

5. Hillside management guidelines must provide for implementation along entire slope segments. To benefit from contour grading, slope cover, irrigation, and drainage/debris protection regulations, these guidelines must be applied across several properties adjoining a single slope segment. Designation of Geologic Hazard Abatement Districts (GHAD) is one

alternative for developing a comprehensive hillside plan along slope segments adjoining canyons and other hillsides in already developed areas.

6. Potentially active landslides, slopes with adverse geologic conditions, and engineered slopes can be destabilized by excessive water. Clay beds within the Puente Formation may be prone to slippage if excessive water is introduced into either an engineered slope or a natural landslide mass. To reduce the potential for activation or reactivation to occur, the introduction of water through landscaping or sewage septic systems must be minimized. This is especially true in areas underlain by either small landslides or deep-seated large landslide complexes that were too large to have been mitigated during smaller grading projects.

7. Expansive soils occur within the city of Chino Hills. Homeowners can improve long-term performance and reduce the potential damage that expansive soils can cause to houses and other improvements by maintaining or improving drainage on their properties, installing gutters, and properly landscaping their properties. Homeowners should be encouraged to plant drought-resistant vegetation on slopes, and around homes and other improvements, including replacing water-thirsty plants such as trees with more drought-tolerant varieties. In addition, irrigation of landscaped areas should be kept to a minimum where possible and care should be taken to avoid cyclic drying and wetting of expansive soils. The City of Chino Hills Municipal Code outlines the requirements for drainage and erosion control measures and expansive soils evaluation in Chapter 16.07, 16.54 and Appendix D, Article 11. Consistency in irrigation of landscaped areas is critical in areas of expansive soils, as the consistent moisture content of the soils will reduce shrinking and swelling of the materials and resultant damage to structures and improvements.

8. Recently deposited alluvial soils in canyon bottoms in the city may be susceptible to adverse settlement. Artificial fill placed without the supervision of a geotechnical engineer and not compacted to an adequate density can also settle if subjected to heavy loads, or as a result of strong ground shaking during an earthquake. These soils should be identified during preliminary geological investigations for a proposed development. In most cases, settlement of these soils can be mitigated by removing and recompacting these settlement-prone materials.

9. Natural slopes are highly vulnerable to shallow soil slippage due to saturation from heavy rains. It is vital for property owners at the top of the slope to control surface drainage from their lot and not allow surface water to flow over the slope face. In addition, all drainage, such as area drain systems, should not be outletted onto any slope.

Flood and Inundation Hazards

California Government Code Section 65302(g) requires local governments to assess the potential impact that failure of a dam or other water retention structure may pose to the community. The Safety Element must also assess the impact of flooding from storm activity, such as 1% annual chance and 0.2% annual chance floods. The potential damage posed by more frequent, smaller-scale floods that occur when storm drain systems become overburdened during strong winter storms is also addressed. These floods can damage property and hinder emergency response activities, such as evacuation and fire department access to fire hydrants.

Storm Flooding

Most rainfall in the Chino Hills area occurs in the winter months between December and March. Runoff from the city generally drains east and south, toward Chino Creek and Prado Flood Control Basin, and on to the Santa Ana River Basin. Canyons on the west side of the city, including Tonner Canyon, Carbon Canyon, Soquel Canyon and Aliso Canyon drain westward toward Los Angeles and Orange Counties. With the exception of Tonner Canyon, which drains into the San Gabriel River watershed, the remaining canyons drain into the lower reaches of the Santa Ana River Basin. All the canyons in the city are prone to seasonal flooding.

Localized flooding has occurred historically in the Chino hills area, generally when drainage facilities are too small to convey the storm flows generated from increased urbanization and paved surfaces in the area. Severe erosion along many natural channels, and debris-clogged drainages, compound the problem. Localized flooding has been known to occur in some areas of the city, notably the lowlands bounded by Pipeline, Eucalyptus and Merrill Avenues and the Chino Creek Channel, also the section of Peyton Road between Eucalyptus Avenue and Carbon Canyon Road. Sheet flooding has also occurred in the Los Serranos area north of the golf course and along portions of English Road.

Portions of the City of Chino Hills have been mapped by the Federal Insurance Administration as part of the National Flood Insurance program. The Flood Insurance Rate Maps (FIRMs) show that most of the areas mapped were designated Zone X and D (National Flood Insurance Program, 2008). Zone X covers those areas of minimal flooding. Zone D is identified as an area where flood hazards are undetermined but possible. Areas on both sides of Carbon Canyon Creek and Little Chino Creek have been classified into Zones A, AE and X (shaded). Zone A is an area with a 1% annual chance of flooding. Those portions of Zone A where the base flood elevations have been determined are classified as Zone AE. Zone X (shaded) is defined as an area with an annual chance of flooding of between 1% and 0.2%; areas subject to a 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from the 1% annual chance flood. The basic flood Zones A, D and X mapped in the City of Chino Hills area are shown on Figures S-8 and S-9. For more

detail on the areas in the city zoned AE (where the base flood elevations have been determined), the Flood Insurance Rate Maps for Chino Hills should be consulted.

Private Drainage

Many of the soils in the Chino Hills area have a high erosion potential. Erosion is not only unsightly but can destabilize adjacent slopes. The importance of installing and maintaining adequate drainage devices on developed hillside lots cannot be overstated (refer to the section on Geologic Hazards). Channeling drainage away from slopes to maintained storm drains minimizes erosion potential on graded slopes.

Property owners should inspect drains and remove any debris on a regular basis. This prevents private drain systems from clogging or overflowing which could channel water and mud downslope with the potential for damage to adjacent properties and structures. Residential drainages often connect into the larger storm drain system which empty into natural drainages such as canyon areas. Paved concrete channels or flood velocity reduction structures are sometimes necessary in natural drainages to prevent erosion caused by channeled runoff. The City of Chino Hills offers Storm Preparedness Tips on their website at https://www.chinohills.org/1172/Storm-Preparedness.

Significant hillside erosion can also occur following a wildland fire. In October 2020, the Blue Ridge Fire burned close to 14,000 acres, mostly within the City of Chino Hills and Chino Hills State Park. Debris-laden floods emanating from recently burned slopes during rainstorms can result in large amounts of sediment deposited in the channels draining the area. To mitigate this hazard, runoff from unimproved areas should be controlled and channeled to adequate drainage facilities. Erosion on slopes can be minimized by covering them with drought-resistant vegetation. Other erosion control measures that can be used to control slope erosion include riprap, gabions and concrete lining. Locating structures in the flow path of hillside gullies or swales should be prohibited unless adequate drainage and debris protection is designed into the project. Section J110.2 of the California Building Code (2019) provides specific erosion control measures, "Where necessary, check dams, cribbing, riprap or other devices or methods shall be employed to control erosion and provide safety."

Seismically Induced Inundation

Seismically induced inundation refers to flooding as a result of water retention structures failing during an earthquake. There are two reservoirs within the city limits, Arnold Reservoir (Chino Ranch No. 1 Dam) and Lake Los Serranos (Rancho Cielito Dam), and two reservoirs adjacent to or upstream from the city that could fail during an earthquake and impact the city. In addition, culverts, levees, stock ponds, and other flood control structures may crack and suffer some structural damage during an earthquake especially in areas susceptible to ground failure. These

facilities could pose an inundation hazard if they contain water at the time of the seismic event, or if they are not repaired soon after an earthquake and prior to the next rain season.

Dam Inundation

California Government Code requires reservoir owners to develop and maintain an emergency plan to be implemented in the event that the dam is catastrophically breached. Each dam-specific emergency plan includes a map that shows the potential limits of the flood that would result if the dam failed while the reservoir is at full capacity. These flooding maps are a worst-case scenario since most reservoirs and flood control structures in Southern California are rarely filled to capacity. Reservoir owners are also required to regularly inspect their dams for safety under supervision from the Department of Water Resources, Division of Safety of Dams. The possibility of inundation in the event of a catastrophic dam failure is therefore remote.

There are two small dams within the City of Chino Hills; Rancho Cielito Dam (retaining Lake Los Serranos) and Chino Ranch No. 1 Dam (retaining Arnold Reservoir) which could cause localized flooding if damaged. San Antonio Dam is located about 10 miles north of the city in San Antonio Canyon in the San Gabriel Mountains. If this dam failed while filled to capacity, the lowlands of the city could be impacted by flooding. A small portion of the city along the southeastern border would also be flooded if Prado Dam, located to the southeast of the city, failed catastrophically while full.

Each of these reservoirs is discussed in more detail below.

- Rancho Cielito Dam (or Lake Los Serranos) is an earthen dam located in the Los Serranos area. The dam was reportedly built between 1880 and 1901 (J. Greening, Jr., personal communication, 2010) although the Department of Water Resources (2021) lists it as having been completed in 1912. The 9-foot-high dam is owned by Rolling Ridge Ranch and was reportedly built to store well water for agricultural purposes. The reservoir has a capacity of 110 acre-feet (acre-foot is a measure of volume equal to 1 acre of land covered with water to a depth of 1 foot) and a dam crest elevation of 644.6 feet above Mean Sea Level (MSL) (Department of Water Resources, 2021). Water in the reservoir is generally kept to within 3 feet of the dam crest (J. Greening, Jr., personal communication, 2010). In the past, the stored water has been used to irrigate the golf course at the Los Serranos Country Club. The dam is inspected yearly by the Division of Safety of Dams (DSOD). The dam inundation map (CADWR, 2019) indicates that in the event of a breach of the dam, the area downgradient from the dam with an elevation below about 642 feet MSL would likely be inundated. Inundation waters would flow east to southeast toward the Chino Valley Freeway, where water would pond behind the freeway and subsequently flow southeastward into Chino Creek and the Prado Dam Flood Control Basin. Inundation depths are predicted to be less than 5 feet.

- Arnold Reservoir is located behind the Chino Ranch No. 1 dam. This dam is located in Tonner Canyon, in the northwest corner of the city. The 22-foot-high dam was completed in 1918 with a crest elevation of 959.5 feet MSL and a storage capacity of 137 acre-feet (Department of Water Resources, 2021). The dam is owned by the Tres Hermanos Conservation Authority (Authority), a joint powers agency with representatives from the cities of Chino Hills, Diamond Bar, and Industry, and the stored water is used for livestock. The dam inundation map (CADWR, 2020) indicates that in the event of a breach of the dam, portions of Tonner Canyon that are presently undeveloped would be inundated to depths of up to 10 feet.

Seiches

Seismically induced flooding can also occur as a result of seiches. Strong ground motion generated by an earthquake may trigger standing wave oscillation, or seiches, in enclosed or semi-enclosed bodies of water, such as lakes or reservoirs. If these seiches generate large enough amplitude, water may overflow the body of water, causing localized flooding of adjacent or downslope areas. Seiches could occur within the two reservoirs within the city, or in other enclosed bodies of water, such as swimming pools. In addition, small private reservoirs or ponds used for livestock water, wildlife management, and natural habitat preservation may be located within Chino Hills in the State Park or other ranching areas. These enclosed bodies of water may be susceptible to seiches, with resultant localized flooding.

Tank Reservoirs

There are currently 16 water tanks in the city (City of Chino Hills Urban Water Management Plan, dated June 2021) used to store water for domestic purposes. These tanks vary in storage capacity between 0.25 and 5.0 million gallons. Five of these tanks are located within the Alquist-Priolo Special Studies Zone of the Chino fault. If a moderate to strong earthquake were to occur on the Chino fault or other nearby fault, these tanks could be damaged releasing the stored water and flooding adjacent developments downslope. Strong ground motions generated by earthquakes can cause water inside the tank to slosh back and forth with great force. Historically this has been known to lift water tanks off their foundations, causing the stored water to drain out of the tank in a matter of minutes and flood the downslope area.

Above ground storage tanks should be adequately attached to the foundation and baffled to reduce the incidence of earthquake-induced structural damage. Water tanks should remain operational after an earthquake as the stored water may be necessary to suppress earthquake-induced fires in the city. Residents may also have to depend on the water stored in these tanks if the city water supply system is damaged.

Issues and Opportunities – Flood and Inundation Hazards

1. A 1% and 0.2% annual chance flood zone has been designated in portions of Little Chino Creek. Flooding in this area can impact traffic on portions of Pipeline, Eucalyptus and Merrill Avenues, Carbon Canyon Road, Peyton Drive, and the Chino Valley Freeway (State Highway 71).

2. New development or expansion of existing development adjacent to canyons increases runoff and erosion. Environmental damage and/or slope instability may result. Increased erosion of hillsides, with consequent sedimentation along natural drainages generally occurs after wildland fires such as the Freeway Complex Fire of 2008 and Blue Ridge Fire of 2020. Erosion control measures such as planting of drought-resistant, fire- retardant vegetation can be used to reduce this hazard. Environmental impact reports must address the impact that development may pose on canyon drainages. Provisions should be made to finance the installation of adequate connectors to the existing storm drain system, and to improve the existing drainage system to accommodate the increased storm flows generated by increased urbanization. The City of Chino Hills has requirements in the Municipal Code, Title 15, Buildings and Construction, and Title 16, Development, for the design and construction of these improvements.

3. Proper drainage is necessary to ensure adequate access for emergency response, fire fighting, or evacuation activities. The city should encourage correction of sheet flow or channel flow problems along existing single access routes or in areas where the existing drainage devices are inadequate. The City of Chino Hills has requirements in the Municipal Code, Title 15, Buildings and Construction, and Title 16, Development, for the design and construction of these improvements.

   Protection of structures from the threat of upslope generated debris flows should be mandated for all new developments and encouraged for all existing structures through community education and awareness. The City of Chino Hills has requirements in the Municipal Code, Title 15, Buildings and Construction, and Title 16, Development, for the design and construction of these improvements.

4. Seismically induced flooding poses a potential hazard to portions of the City of Chino Hills. If the dam forming Lake Los Serranos failed during an earthquake, the water released would flood those areas to the east and southeast of the lake at elevations below 642 feet above mean sea level. Failure of the dam impounding Arnold Reservoir would result in flooding along the presently undeveloped Tonner Canyon. The lowlands in the eastern portion of the city could be flooded if San Antonio Dam failed during an earthquake. If Prado Dam failed during an earthquake, the southeastern corner of the city could also be flooded.

5. Localized, seismically induced flooding could also occur if an earthquake generates seiches in Lake Los Serranos or Arnold Reservoir. Sloshing water may also damage many of the water tanks in the city if they are not adequately anchored to their foundations and internally baffled. The majority of water tanks in the city satisfy these requirements. Development downslope from water tanks could be flooded if water is released during an earthquake.

Hazardous Materials

Oil and Gas Wells

Petroleum and natural gas have been produced from oil fields in the eastern Puente Hills since the late 1880s. The Chino-Soquel oil field is located in the rugged area around Soquel Canyon, to the east of Sleepy Hollow (see Figure S-10). The Mahala oil field is located south of the Butterfield Ranch development in the eastern portion of the city. The Well Finder Map issued by the California Geologic Energy Management Division (CalGEM) (accessed February 2022) indicate there are many plugged oil and gas wells in the city.

Most of these wells were likely not abandoned to current CalGEM regulations. If development is planned for an area known to have plugged and/or abandoned oil wells, these wells should be inspected and if necessary re-abandoned to meet current regulations. If the property is planned for development, all wells must be slurry filled to minimize future problems. The City Planning Department is required to submit building permit applications to the Long Beach office of CalGEM if an oil well is known to have occurred in the area planned for development. If according to the CalGEM records, the wells in the area were not abandoned properly, it is the responsibility of the property owner to do so. Most wells plugged after the late 1970s were abandoned to current standards. However all applicable building permit applications still should be submitted to the CalGEM for review.

Geological investigations that address environmental issues associated with oil field operations should be conducted prior to such areas being developed. Hazards that may require remediation and mitigation could include venting of gases, petroleum-saturated soils and soils contaminated with diesel, heavy metals or other hazardous substances.

Goals, Objectives and Policies

Seismic Hazards

Many of the active faults in Southern California have the potential to generate strong ground motions in the City of Chino Hills. The San Andreas and San Jacinto faults are generally thought to have the highest probabilities of generating a moderate to large earthquake in the near future. However, the Chino fault is delineated as an active fault pursuant to the guidelines of the Alquist-Priolo Earthquake Fault Zone Act, and must be considered as the probable worst-case

scenario for the city of Chino Hills, posing the greatest seismic threat to public safety and economic welfare. It is estimated the Chino fault could generate near-field, high-frequency ground motions on the order of approximately 0.35 to 0.6g, with MMI Scale values ranging from VIII to IX. Such an earthquake would cause extensive damage to buildings and infrastructure as a result of strong ground motions, ground rupture, and possibly liquefaction and other secondary seismic hazards.

Potential impacts from seismic hazards are best mitigated through advance planning, special analyses, and code enforcement. In addition, residents should be encouraged to prepare for earthquakes by reinforcing inadequate structures, compiling earthquake kits, and developing emergency plans. The City of Chino Hills website provides emergency preparedness tips at https://www.chinohills.org/77/Emergency-Preparedness.

Geologic Hazards

Geologic hazards of greatest concern in the city of Chino Hills include slope instability, expansive soils, compressible soils, and erosion. A large portion of the city has been mapped as generally susceptible to landsliding (Figure S-6). Recently deposited stream sediments in canyon bottoms are susceptible to settling if subject to heavy loads, such as from building foundations. Some of the soils and bedrock units that underlie Chino Hills have a moderate to high expansion potential. Structures sited on untreated, highly expansive materials can experience substantial structural damage as a result of shrinking and/or swelling of these soils. Rationally designed stiffened foundations should be utilized in these areas.

Grading and construction operations are necessary to mitigate expansive and compressible soils, erosion, landsliding, and flooding in hillside areas. The City of Chino Hills Municipal Code outlines the requirements for grading and mitigation of geologic hazards in Chapters 16.50, 16.52, and 16.54. Efforts should be made to balance grading and construction to minimize geologic hazards with aesthetics and the preservation of natural, existing topography.

Flood and Inundation Hazards

Potential seismically induced inundation hazards in Chino Hills include flooding of the eastern portions of the city as a result of failure of San Antonio Dam while its reservoir is full, and localized flooding if the dams for Lake Los Serranos or Arnold Reservoir fail during an earthquake. Strong ground motions generated by an earthquake could also damage the water tanks in the city, especially if these are not baffled or braced. Localized storm flooding has occurred historically in Chino Hills, the result of inadequately sized drainage facilities that cannot convey the storm flows generated from increased urbanization of the area.

CLOSURE

We appreciate this opportunity to be of service to the City of Chino Hills. Supporting data, including tables and figures, are located at the rear of this text.



Respectfully submitted,

Lisa Bates, PG, CEG 2293
Associate Engineering Geologist

Gregory Silver, M.Sc., PE, GE 2336
Principal Geotechnical Engineer

REFERENCES

Bakun, W.H., 2006, Estimating locations and magnitudes of earthquakes in Southern California from modified Mercalli intensities: Bulletin of the Seismological Society of America, v. 96, p. 1278-1295.

Bates, L., 2022, GMU Geotechnical, personal communication.

California Department of Water Resources, 1970, Meeting Water Demands in the Chino-Riverside Area: Department of Water Resources Bulletin No. 104-3.

California Department of Water Resources, 2020, Dam Inundation Map Chino Ranch #1, DWR Dam No. 2025.000, National ID No. CA 00755, San Bernardino County, CA. Prepared August 24, 2020.

California Department of Water Resources, 2019, Dam Inundation Map for Emergency Preparedness Rancho Cielito Dam, DSOD No. 808.000, National ID No. CA00761, San Bernardino County, CA. Prepared October 2, 2019.

Cao, T., Bryant, W.A., Rowshandel, B., Braum, D. and Wills, C.J., 2003, the revised 2002 California probabilistic seismic hazard maps: California Geological Survey, 11p.

City of Chino Hills, 2022, Website: https://www.chinohills.org/FAQ.aspx?QID=284, accessed April 2022.

City of Chino Hills, 2020, Hazard mitigation Plan dated July, 2020.

Crook, R., Jr., Allen, C.R., Kamb, B., Payne, C.M., and Proctor, R.J., 1987, Quaternary geology and seismic hazard of the Sierra Madre and associated faults, western San Gabriel Mountains, in Recent reverse faulting in the Transverse Ranges, California: U.S. Geological Survey Professional Paper 1339, p. 27-64.

Dawson, T., Rockwell, T., Weldon II, R. J., and Wills, C.J., 2008, Summary of geologic data and development of *A-Priori* rupture models for the Elsinore, San Jacinto and Garlock faults: California Geological Survey Special Report 203F, 23p.

Dolan, J.F., Christofferson, S.A., and Shaw, J.H., 2003, Recognition of paleoearthquakes on the Puente Hills Blind Thrust Fault, California: Science, v. 300, p. 115-118.

Federal Emergency Management Agency, 2008, National Flood Insurance Program, Flood Insurance Rate Map, Los Angeles County, California, Panel 1919 dated January 6, 2016.

Field, E.H., and 2014 Working Group on California Earthquake Probabilities, 2015, UCERF3: A new earthquake forecast for California's complex fault system: U.S. Geological Survey 2015– 3009, 6 p., https://dx.doi.org/10.3133/fs20153009.

Fife, D.L., Rodgers, D.A., Chase, G.W., Chapman, R.H.., and Sprotte, E.C., 1976, Geologic hazards in southwestern San Bernardino County, California: California Division of Mines and Geology special Report 113.

Fumal, T.E., and Kendrick, K.J., 2008, Paleoseismic Investigations of the Walnut Site on the San Jacinto Fault: California Geological Survey Special Report 203O, 3 Plates.

Greening, J. Jr., 2010, Los Serranos owner, personal communication.

Gurrola, L.D., and Rockwell, T.K., 1996, Timing and slip for prehistoric earthquakes on the Superstition Mountain fault, Imperial Valley, Southern California: Journal of Geophysical Research, v. 101, no. B3, p. 5977-5985.

Hart, E.W. and Bryant W.A., 1999, Fault Rupture Hazard Zones in California, Alquist-Priolo Earthquake Fault Zoning Act with Index to Earthquake Fault Zones Maps, California Geological Survey Special Publication 42, 38p.

Hauksson, E., 1994, The 1991 Sierra Madre earthquake: Seismological and tectonic analysis: Bulletin of the Seismological Society of America v. 84, p. 1058-1074.

Hauksson, E., and Jones, L. M., 1991, The 1988 and 1990 Upland earthquakes: Left-lateral faulting adjacent to the central Transverse Ranges: Journal of Geophysical Research v. 96, p. 8143-8165.

Hauksson, E., Felzer, K., Given, D., Giveon, M., Hough, S., Hutton, K., Kanamori, H., Sevilgen, V., Wei, S., and Yong, A., 2008, Preliminary Report on the 29 July 2008 Mw 5.4 Chino Hills, Eastern Los Angeles Basin, California, Earthquake Sequence: Seismological Research Letters v. 79, no. 6, p. 855-866.

Jennings, C.W., 2010, Fault Activity Map of California and Adjacent Areas, Geologic Data Map No. 6, Department of Conservation, Division of Mines and Geology.

Lofgren, B.E., 1971, Estimated Subsidence in the Chino-Riverside and Bunker Hill-Yucaipa Areas in Southern-California for a Postulated Water-Level Lowering, 1965-2015: U.S. Geological Survey, Water Resources Division, Open-File Report.

Magistrale, H., and Rockwell, T., 1996, The central and southern Elsinore fault zone, southern California: Bulletin of the Seismological Society of America, v. 86, p. 1793-1803.

O'Rourke, T., Lane, P., 1989, Liquefaction Hazards and Their Effects on Buried Pipelines, National Center for Earthquake Engineering Research 89-0007.

Patterson, A.C., and Rockwell, T.K., 1993, Paleoseismology of the Whittier Fault Based on 3-Dimensional Trenching at Olinda Oil Field, Orange County, Southern California: in Geological Society of America, Abstracts with Programs, Volume 25, No. 5, p.131.

Rasmussen, G.S., 1982, Historic earthquakes along the San Jacinto fault zone, San Jacinto, California: in Neotectonics in Southern California, GSA Cordilleran Section 78th Annual Meeting Volume and Guidebook, Field Trip No. 4, 115-121.

Rockwell, T.K., 1989, Behavior of individual fault segments along the Elsinore-Laguna Salada fault zone, southern California and northern Baja California--Implications for the characteristic earthquake model, in Schwartz, D.P., and Sibson, R.H., eds., Proceedings of Conference XLV-- Fault segmentation and controls of rupture initiation and termination: U.S. Geological Survey Open-File Report 89-315, p. 288-308.

Rockwell, T., 1990, Holocene activity of the Elsinore fault in the Coyote Mountains, southern California, in Rockwell, T., ed., Western Salton trough soils and neotectonics: Friends of the Pleistocene, Field Trip - 1990, Guidebook, p. 30-42.

Rockwell, T, Seitz, G., Dawson, T., and Young, J, 2006, (abstract) The long record of San Jacinto fault paleoearthquakes at Hog Lake: Implications for regional patterns of strain release in the southern San Andreas fault system: Seismological Research Letters, v. 77, p. 270.

Rubin, C.M., Lindvall, S.C., and Rockwell, T.R., 1998, Evidence for Large Earthquakes in Metropolitan Los Angeles: Science, v. 281, p. 398-402.

San Bernardino County Fire, Office of Emergency Services, 2018, San Bernardino County Emergency Operations Plan (EOP).

Shaw, J. H., and Shearer, P. M., 1999, An elusive blind-thrust fault beneath metropolitan Los Angeles: Science v. 283, p. 1,516-1,518.

Shaw, J.H., Plesch, A., Dolan, J.F., Pratt, T.L., and Fiore, P., 2002, Puente Hills blind-thrust system, Los Angeles, California: Bulletin of the Seismological Society of America, v. 92, p. 2946-2960.

Shlemon R.J., and Hakakian, M., 1992, Fissures Produced Both by Groundwater Rise and Groundwater Fall: A Geological Paradox in the Temecula-Murrieta Area, Southwestern Riverside County, California: Proceedings, Association of Engineering Geologists 35th Annual Meeting, October 2-9, 1992, pp. 143-150.

Thorup, K.M., 1997, Paleoseismology of the central Elsinore fault in southern California--Results from three trench sites: San Diego, California, San Diego State University, unpublished M.S. thesis, 94p.

Treiman, J.A., 2002, Chino Fault, Riverside and San Bernardino Counties, California: California Geological Survey Fault Evaluation Report (FER) 247, 17p.

Vaughan, P. R., Thorup, K. M., and Rockwell T. K., 1999, Paleoseismology of the Elsinore fault at Agua Tibia Mountain southern California. *Bulletin of the Seismological Society of America* 1999; 89 (6): 1447–1457.

Ward, W., 2022, City of Chino Hills, personal communication.

Wills, C.J., Weldon II, R. J., and Bryant, W.A., 2008, California Fault Parameters for the National Seismic Hazard Maps and Working Group on California Earthquake Probabilities 2007: California Geological Survey Special Report 203A, 48p.

Woodruff, G.A., and Brock, W.Z., 1980, Soil survey of San Bernardino County, southwestern part, California: U.S. Department of Agriculture, Soil Conservation Service, 64 p., scale 1:24,000.

Working Group on California Earthquake Probabilities, 1988, Probabilities of large earthquakes occurring in California on the San Andreas fault, U.S. Geological Survey Open-File Report, 62p.

Working Group on California Earthquake Probabilities, 2008, The Uniform California Earthquake Rupture Forecast, Version 2 (UCERF 2): California Geological Survey Special Report 203, 96p.

Youd, T.L., and 20 others, I.M., 2001, Liquefaction Resistance of Soils: Summary Report from the 1996 NCEER and 1998 NCEER/NSF Workshops on Evaluation of Liquefaction Resistance of Soils: Journal of Geotechnical and Geoenvironmental Engineering v. 127, pp. 817-833.

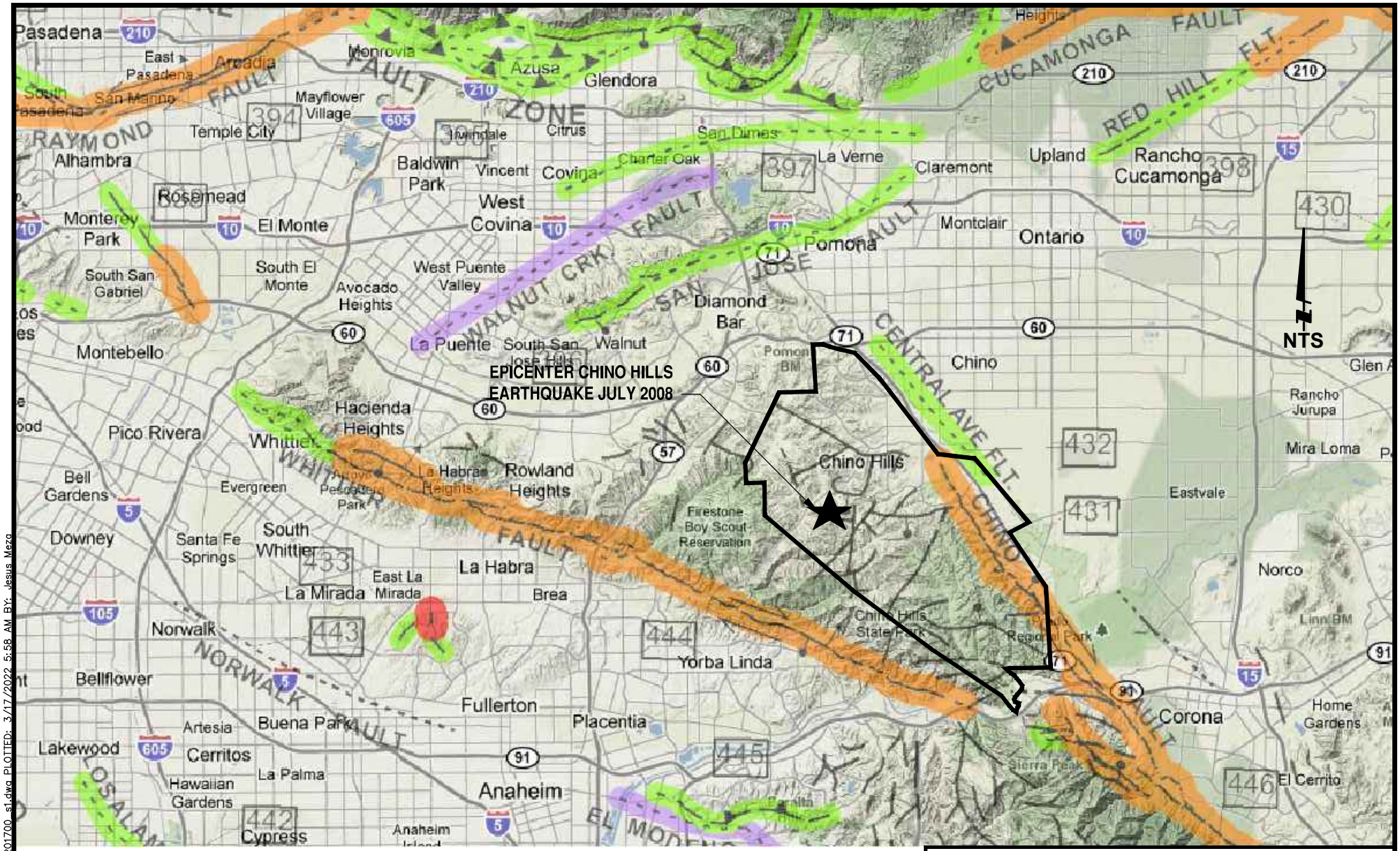
TABLE S-1
Modified Mercalli Intensity Scale

Intensity	Description	Average Peak Acceleration
I.	Not felt except by a very few under especially favorable circumstances.	-
II.	Felt by only a few persons at rest, especially on upper floors of buildings. Delicately suspended objects may swing.	-
III.	Felt quite noticeably indoors, especially on upper floors of buildings but many people do not recognize it as an earthquake. Standing automobiles may rock slightly. Vibration like passing of truck. Duration estimated.	-
IV.	During the day felt indoors by many, outdoors by few. At night some awakened. Dishes, windows, doors disturbed; walls make creaking sound. Sensation like heavy truck striking building. Standing automobiles rocked noticeably.	0.015-0.02g
V.	Felt by nearly everyone, many awakened. Some dishes, windows and so on broken; cracked plaster in a few places; unstable objects overturned. Disturbances of trees, poles and other tall objects sometimes noticed. Pendulum clocks may stop.	0.03-0.04g
VI.	Felt by all, many frightened and run outdoors. Some heavy furniture moved; a few instances of fallen plaster and damaged chimneys. Damage slight.	0.06-0.07g
VII.	Everyone runs outdoors. Damage negligible in buildings of good design and construction; slight to moderate in well-built ordinary structures; considerable in poorly built or badly designed structures; some chimneys broken. Noticed by persons driving in cars.	0.10-0.15g
VIII.	Damage slight in specially designed structures; considerable in ordinary substantial buildings with partial collapse; great in poorly built structures. Panel walls thrown out of frame structures. Fall of chimneys, factory stack, columns, monuments and walls. Heavy furniture overturned. Sand and mud ejected in small amounts. Changes in well water. Persons driving cars disturbed.	0.25-0.30g
IX.	Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb; great in substantial buildings, with partial collapse. Buildings shifted off foundations. Ground cracked conspicuously. Underground pipes broken.	0.50-0.55g
X.	Some well built wooden structures destroyed; most masonry and frame structures destroyed with foundations; ground badly cracked. Rails bent. Landslides considerable from river banks and steep slopes. Shifted sand and mud. Water splashed, slopped over banks.	More than 0.60g
XI.	Few (if any) masonry structures remain standing. Bridges destroyed. Broad fissures in ground. Underground pipelines completely out of service. Earth slumps and land slips in soft ground. Rails bent greatly.	More than 0.60g
XII.	Damage total. Waves seen on ground surface. Lines of sight and level distorted. Objects thrown in air.	More than 0.60g

TABLE S-2
Earthquake Faults and Magnitudes

Fault Name/Zone	Fault Segments	Displacement Style[4]	Approx. Fault Length (km)	Estimated Maximum Magnitude[1,3]	Estimated Maximum Magnitude[2,3]	Historical Earthquakes
Chino	n/a	rl-r-o	28.7	6.80	6.60	2/16/1989, M3.2 12/14/2001, M3.9
Elsinore	W+GI+T+J+CM	rl-ss	249.2	7.78	7.85	5/15/1910, M6
San Jose	n/a	ll-r-o	19.6	6.70	6.50	6/26/1988, M4.7
Puente Hills Blind Thrust	n/a	r	44.1	7.10	7.00	10/1/1987, M6.0
Sierra Madre	n/a	r	56.9	7.20	7.10	2/9/1971, M6.4
Cucamonga	n/a	r	28.0	6.70	6.50	
San Jacinto	SBV+SJV+A+C	rl-ss	205.7	7.73	7.78	4/21/1918, M6.8 4/9/1968, M6.5 12/25/1899, M6.7
San Andreas	PK+CH+CC+BB+NM+SM+NSB+SSB+BG+CO	rl-ss	546.1	8.04	8.18	12/8/1812, M7.5 1/9/1857, M7.9

1: Magnitude calculated method of Ellsworth
2: Magnitude calculated method of Hanks and Bakun (2002)
3: Estimated maximum magnitude for largest “likely” earthquake rupture presented in UCERF2
4: rl=right-lateral, ll=left-lateral, o=oblique, ss=strike-slip, r-reverse



EXPLANATION

Fault traces on land are indicated by solid lines where well located, by dashed lines where approximately located or inferred, and by dotted lines where concealed by younger rocks or by lakes or bays. Fault traces are queried where continuation or existence is uncertain.

SOURCE:
2010 FAULT ACTIVITY MAP OF CALIFORNIA,
State of California
Department of Conservation

FAULT CLASSIFICATION COLOR CODE
(Indicating Recency of Movement)

Fault along which historic (last 200 years) displacement has occurred.

Holocene fault displacement (during past 11,700 years) without historic record.

Late Quaternary fault displacement (during past 700,000 years).

Quaternary fault (age undifferentiated).

Pre-Quaternary fault (older that 1.6 million years) or fault without recognized Quaternary displacement.

ADDITIONAL FAULT SYMBOLS

Bar and ball on downthrown side (relative or apparent).

Arrows along fault indicate relative or apparent direction of lateral movement.

Arrow on fault indicates direction of dip.

Low angle fault (barbs on upper plate).

ACTIVE & POTENTIALLY ACTIVE FAULTS

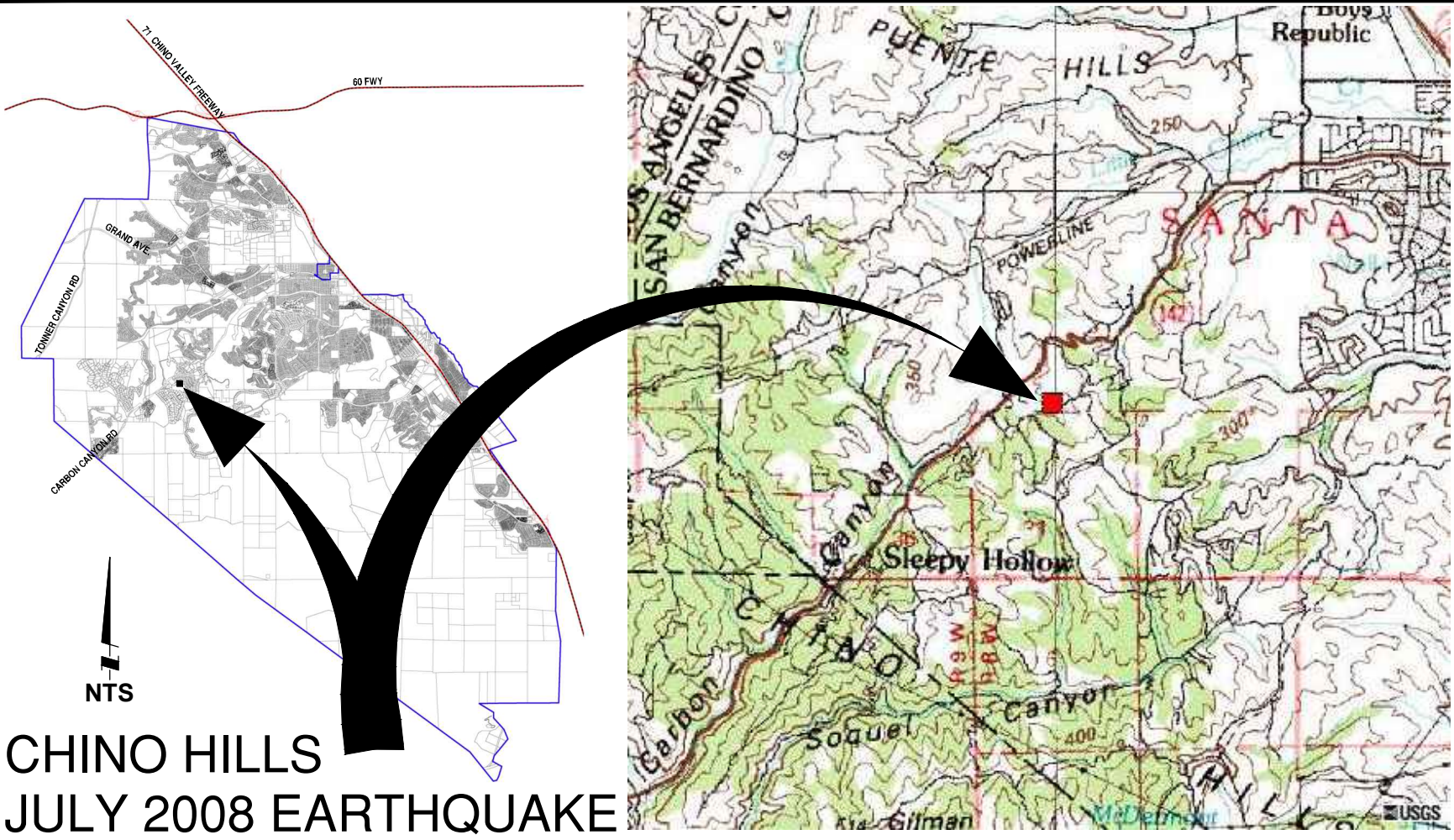
GMU

Date: May 10, 2022

Project No.: 22-017-00

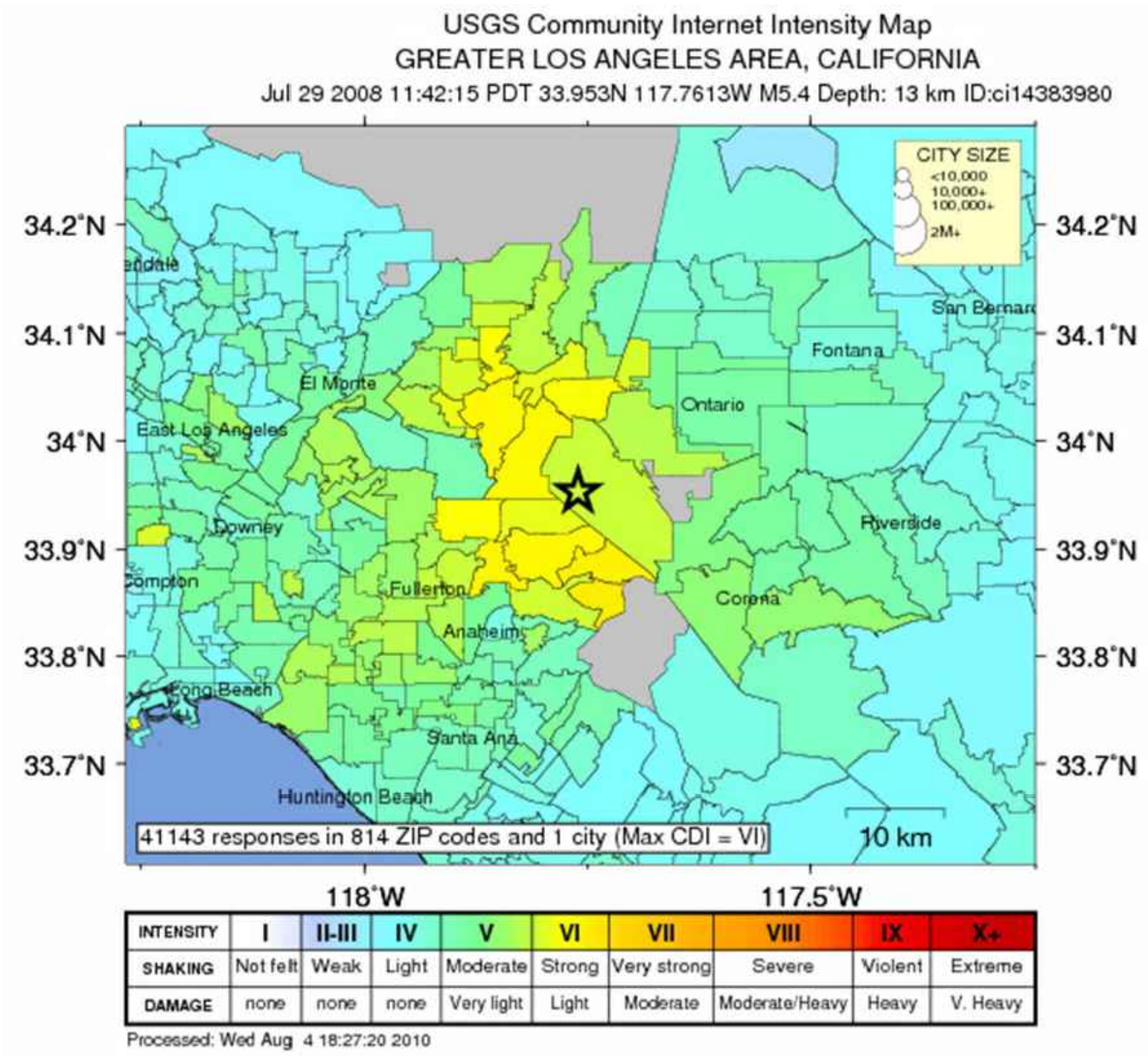
Plate S-1

DRAWING: a:\2022\22-017-00\dwg\2201700_s1.dwg PLOTTED: 3/17/2022 5:58 AM BY: Jesus Meza



CHINO HILLS
JULY 2008 EARTHQUAKE
EPICENTER

USGS TOPOGRAPHIC MAP



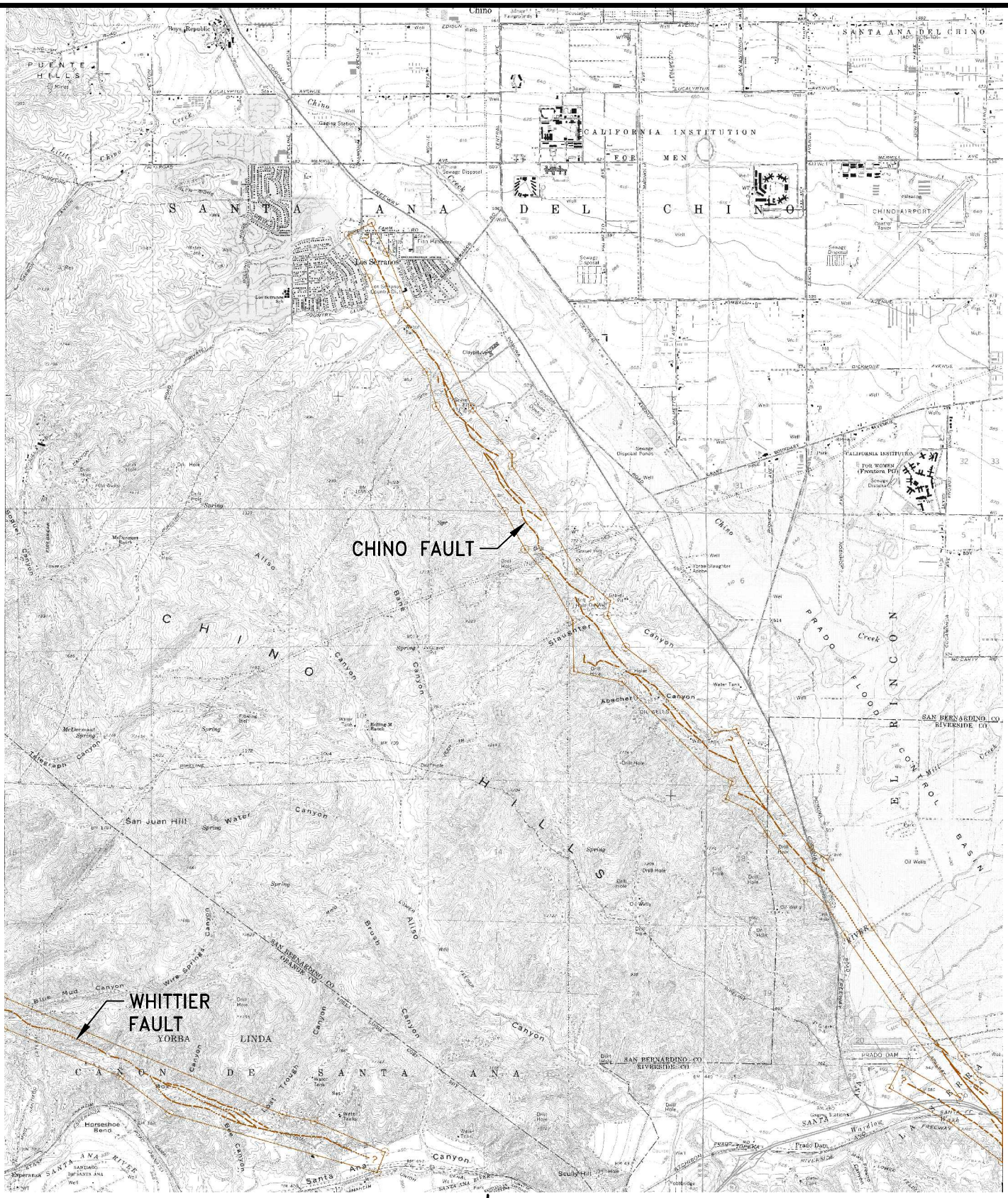
INTENSITY	I	II-III	IV	V	VI	VII	VIII	IX	X+
SHAKING	Not felt	Weak	Light	Moderate	Strong	Very strong	Severe	Violent	Extreme
DAMAGE	none	none	none	Very light	Light	Moderate	Moderate/Heavy	Heavy	V. Heavy

MAGNITUDE: 5.5
DATE–TIME: TUESDAY, JULY 29, 2008 AT 18:42:15 UTC
TUESDAY JULY 29, 2008 AT 11:42:15 AM (PDT) AT EPICENTER
LOCATION: 33.953°N, 117.761°W
DEPTH: 14.7 km (9.1 miles)
REGION: GREATER LOS ANGELES AREA, CALIFORNIA
SOURCE: CALIFORNIA INTEGRATED SEISMIC NET
USGS, CALTECH, CGS, UCB, UCSD, UNR
EVENT ID: ci14383980

CHINO HILLS
JULY 2008 EARTHQUAKE
EPICENTER MAP

GMU | Date: May 10, 2022 | Plate
Project No.: 22-017-00 | S-2

DRAWING: q:\2022\22-017-00\dwg\2201700_s-2.dwg PLOTTED: 3/17/2022 6:06 AM BY: Jesus Meza



Copyright© 2003 by the California Department of Conservation, California Geological Survey. All rights reserved.

NTS

MAP SOURCE:
STATE OF CALIFORNIA
EARTHQUAKE FAULT ZONES
PRADO DAM QUADRANGLE
REVISED OFFICIAL MAP
EFFECTIVE: MAY 1, 2003

SEISMIC HAZARDS FAULT RUPTURE

GMU

Date: May 10, 2022	Plate
Project No.: 22-017-00	S-3

DRAWING: q:\2022\22-017-00\dwg\2201700_s-3.dwg PLOTTED: 3/17/2022 6:08 AM BY: Jesus Meza

71 CHINO VALLEY FREEWAY

60 FWY

L

H

M

NTS

FAULT
LONG DASHED WHERE WELL-LOCATED; SHORT DASHED WHERE APPROXIMATE OR INDEFINITE; DOTTED WHERE CONCEALED OR BURIED; QUERIED WHERE UNCERTAIN.

FAULT HAZARD ZONE

AREAS OF HIGH LIQUEFACTION POTENTIAL
SHALLOW GROUNDWATER CONDITIONS WITHIN 30 FEET OF THE GROUND SURFACE ARE KNOWN OR SUSPECTED, INCLUDING MARSHY AREAS PRESENT IN THE LATE 1800'S. AREAS ARE UNDERLAIN BY UNCONSOLIDATED SANDY ALLUVIAL SOILS.

AREAS OF MODERATE LIQUEFACTION POTENTIAL
SHALLOW GROUNDWATER CONDITIONS BETWEEN 30 AND 50 FEET BELOW THE GROUND SURFACE ARE KNOWN OR SUSPECTED. INCLUDES ALLUVIUM-FILLED CANYONS THAT MAY HAVE SEASONAL, PERCHED GROUNDWATER.

AREAS OF LOW LIQUEFACTION POTENTIAL
GROUNDWATER IS 50 FEET BELOW GROUND SURFACE AND DEEPER. AREAS ARE UNDERLAIN BY CONSOLIDATED SEDIMENTS OR BEDROCK.

Source: Leighton & Associates, Inc., USGS

NOTE:
This is an interpretive map based on the distribution of susceptible alluvial sediments and known or suspected shallow or perched goundwater. The map presents a regional interpretation of liquefiable areas for general land planning purposes only. Site-specific liquefaction studies should be conducted for development purposes.

LIQUEFACTION SUSCEPTIBILITY SEISMICALLY-INDUCED LANDSLIDE HAZARD ZONES

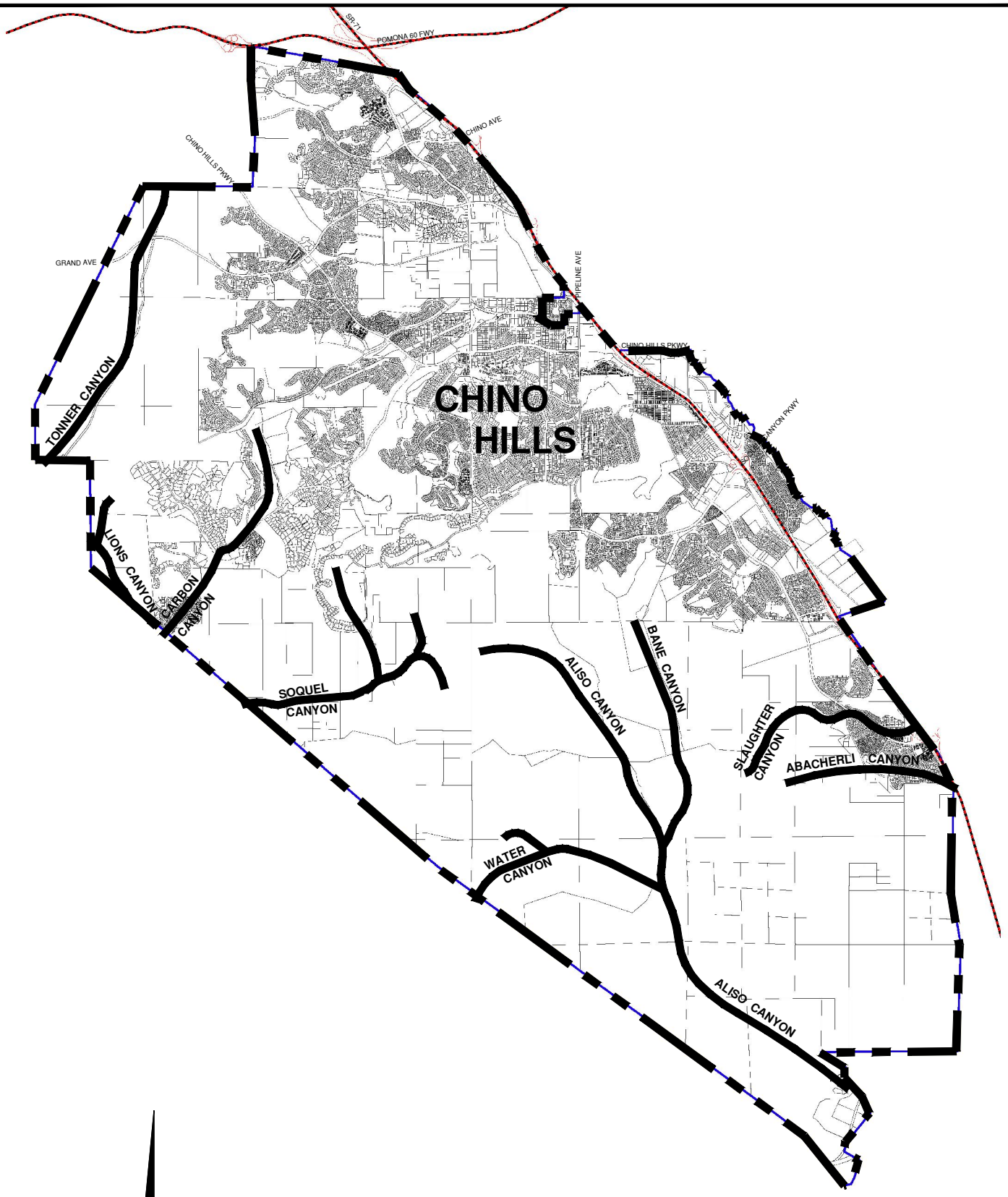
GMU

Date: May 10, 2022

Project No.: 22-017-00

Plate S-4

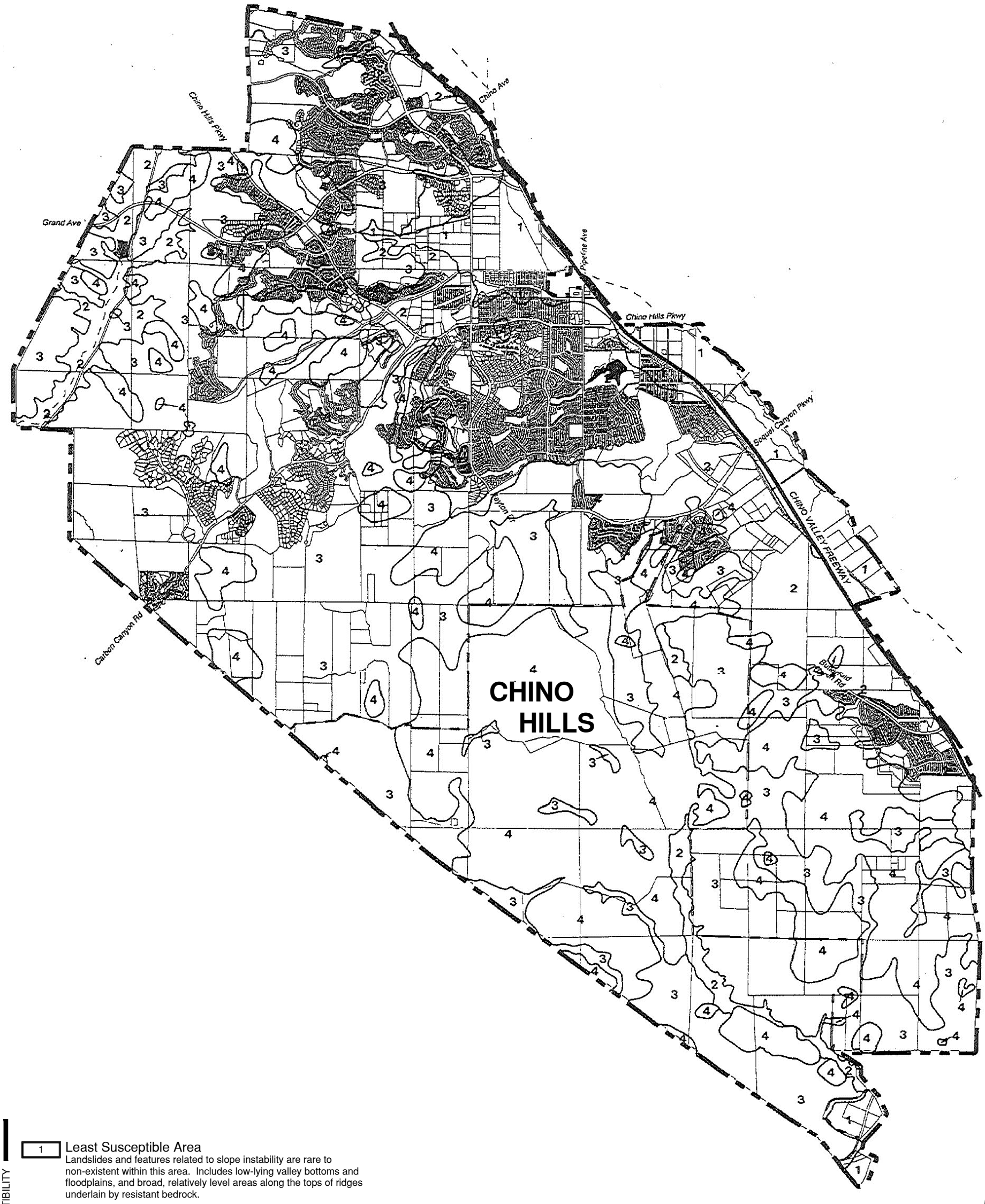
DRAWING: q:\2022\22-017-00\dwg\2201700_s-4.dwg PLOTTED: 3/17/2022 6:10 AM BY: Jesus Meza



Canyons in the City of Chino Hills

GMU	Date: May 10, 2022	Plate
	Project No.: 22-017-00	S-5

DRAWING: c:\2022\22-017-00\dwg\2201700_s-5.dwg PLOTTED: 3/17/2022 6:15 AM BY: Jesus Meza



INCREASING LANDSLIDE SUSCEPTIBILITY

1 Least Susceptible Area
Landslides and features related to slope instability are rare to non-existent within this area. Includes low-lying valley bottoms and floodplains, and broad, relatively level areas along the tops of ridges underlain by resistant bedrock.

2 Margionally Susceptible Area
Includes gentle to moderate slopes, and ridgetops underlain by relatively competent material but flanked by steep, potentially unstable slopes. The stability of slopes in this area may change in response to future natural or man-induced alteration of the adjacent terrain.

3 Generally Susceptible Area
Slopes are at or near their stability limits due to a combination of weak materials and steep slopes. Most slopes in this area do not currently contain landslides deposits; however, the materials that underlie them can be expected to fail locally when modified by natural processess or activities of man.

4 Most Susceptible Area
Characterized by steep slopes; includes most landslides in upslope areas, whether apparently active or not, and slopes with substantial evidence of downslope creep of surface materials. Land in this area should by considered unstable and subject to failure, even in the absence of the activities of man.

NTS

Landslide Susceptibility

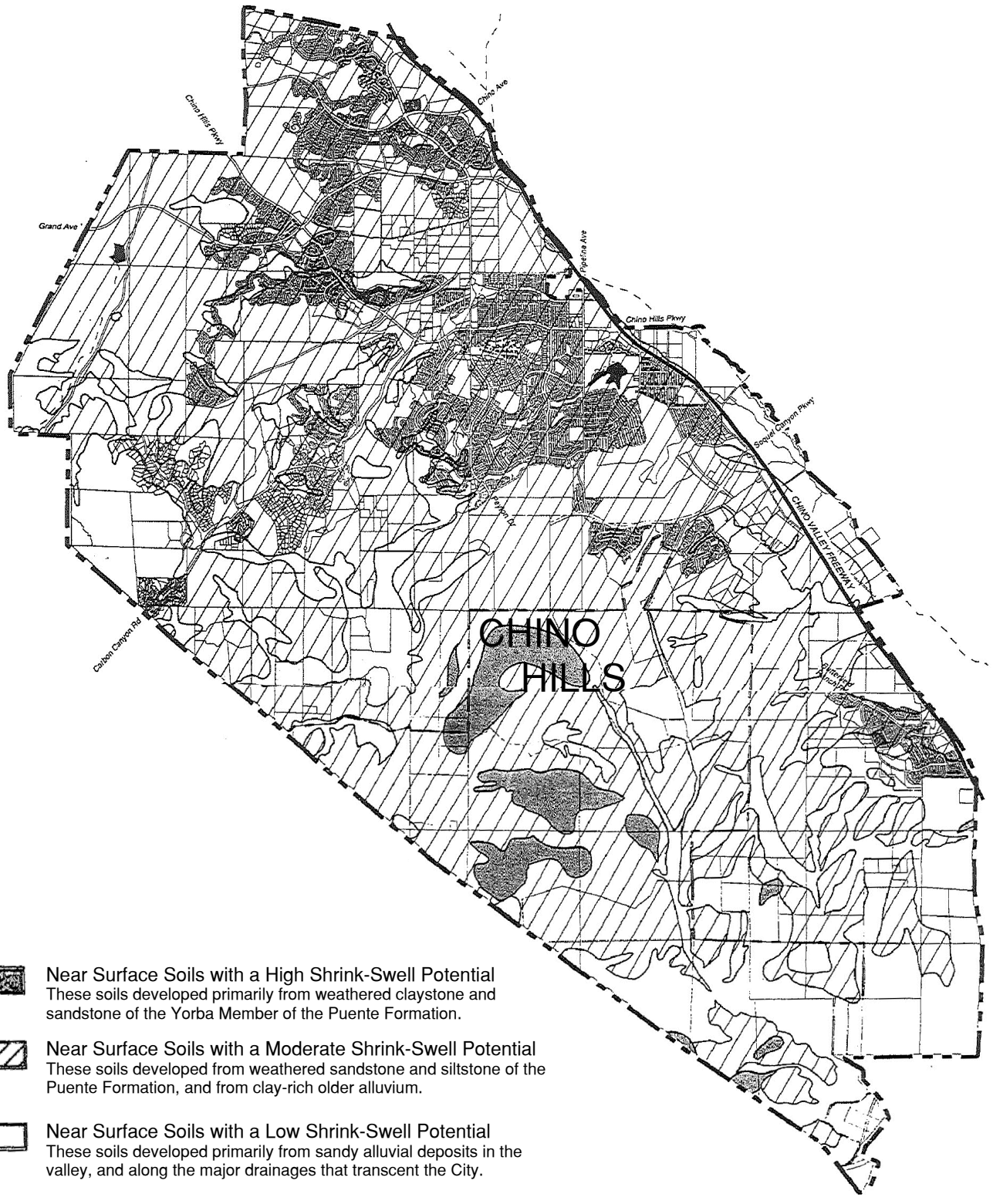
GMU

Date: May 10, 2022

Project No.: 22-017-00

Plate S-6

DRAWING: q:\2022\22-017-00\dwg\2201700_s-6.dwg PLOTTED: 3/17/2022 6:17 AM BY: Jesus Meza



Near Surface Soils with a High Shrink-Swell Potential
These soils developed primarily from weathered claystone and sandstone of the Yorba Member of the Puente Formation.

Near Surface Soils with a Moderate Shrink-Swell Potential
These soils developed from weathered sandstone and siltstone of the Puente Formation, and from clay-rich older alluvium.

Near Surface Soils with a Low Shrink-Swell Potential
These soils developed primarily from sandy alluvial deposits in the valley, and along the major drainages that transcent the City.

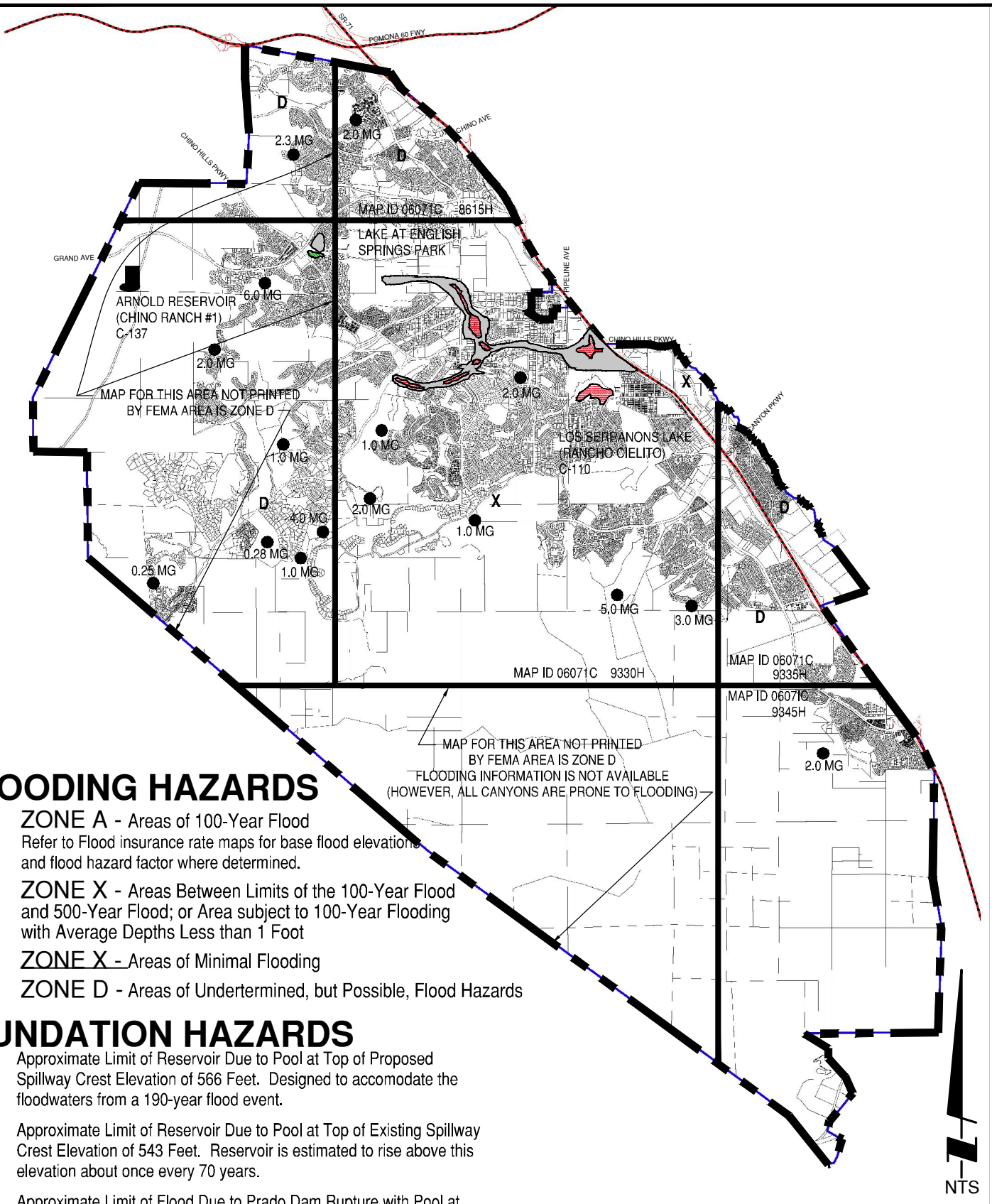
NTS

NOTE: This figure shows the relative shrink-swell potential of the soils that occur at the surface in the City of Chino Hills. Volcanic Ash layers within the Puente Formation generally weather to clay with a high shrink-swell potential. These ash layers may uncovered during grading operations, affecting the proposed development at final grade. Site-specific soil studies need to be conducted to evaluate the expansion potential of the soil materials at grade prior to construction. Those ash layers could occur in other areas than those identified herein as having soils with a high expansion potential.

Expansive Soils

GMU	Date: May 10, 2022	Plate
	Project No.: 22-017-00	S-7

DRAWING: q:\2022\22-017-00\dwg\2201700_s-7.dwg PLOTTED: 3/17/2022 6:30 AM BY: Jesus Meza



FLOODING HAZARDS

ZONE A - Areas of 100-Year Flood
Refer to Flood insurance rate maps for base flood elevations and flood hazard factor where determined.

ZONE X - Areas Between Limits of the 100-Year Flood and 500-Year Flood; or Area subject to 100-Year Flooding with Average Depths Less than 1 Foot

X ZONE X - Areas of Minimal Flooding

D ZONE D - Areas of Undertermined, but Possible, Flood Hazards

INUNDATION HAZARDS

Approximate Limit of Reservoir Due to Pool at Top of Proposed Spillway Crest Elevation of 566 Feet. Designed to accomodate the floodwaters from a 190-year flood event.

Approximate Limit of Reservoir Due to Pool at Top of Existing Spillway Crest Elevation of 543 Feet. Reservoir is estimated to rise above this elevation about once every 70 years.

Approximate Limit of Flood Due to Prado Dam Rupture with Pool at Spillway Crest Elevation of 543 Feet.

Approximate Limit of Flood Due to San Antonio Dam Rupture with Pool at Spillway Crest Elevation of 2,238 Feet.

Water Tank (MG = capacity in millions of gallons)

6.0 MG Man-Made Lake (C = capacity in acre-feet)
Under the Jurisdiction of the State of California, Division of Safety of Dams

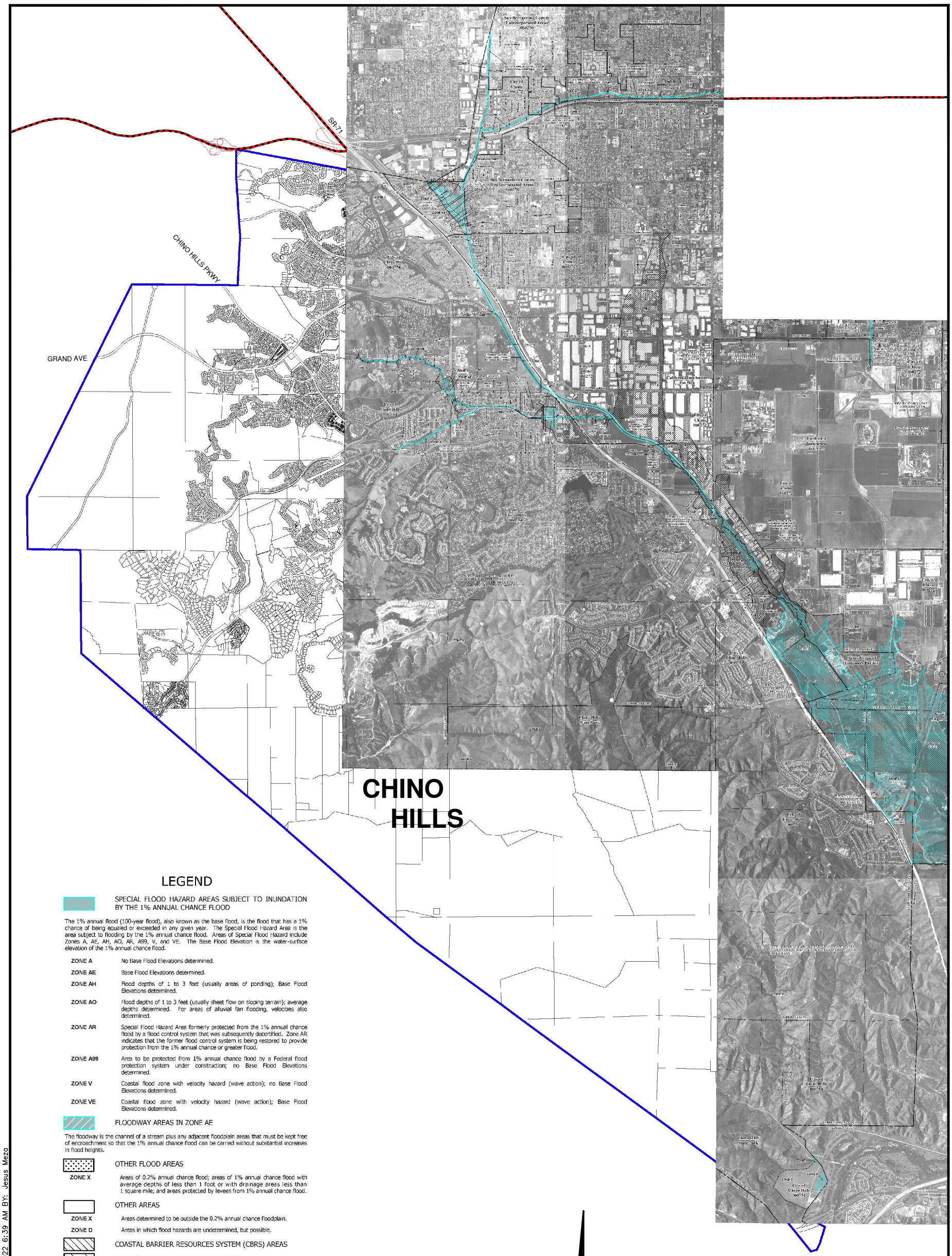
C-137 Lake Not Under the Jurisdiction of the State of California, Division of Safety Dams

Flooding and Inundation Hazards

GMU

Date: May 10, 2022	Plate
Project No.: 22-017-00	S-8

DRAWING: c:\2022\22-017-00\dwg\2201700_s-8.dwg PLOTTED: 3/17/2022 6:37 AM BY: Jesus Mezo



LEGEND

SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A	No Base Flood Elevations determined.
ZONE AE	Base Flood Elevations determined.
ZONE AH	Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
ZONE AO	Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
ZONE AR	Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
ZONE A99	Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
ZONE V	Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
ZONE VE	Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X	Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X	Areas determined to be outside the 0.2% annual chance floodplain.
ZONE D	Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

	1% annual chance floodplain boundary
	0.2% annual chance floodplain boundary
	Floodway boundary
	Zone D boundary
	CBRS and OPA boundary
	Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
513	Base Flood Elevation line and value; elevation in feet*
(EL 987)	Base Flood Elevation value where uniform within zone; elevation in feet*

* Referenced to the North American Vertical Datum of 1988

A ——— A	Cross section line
23 ——— 23	Transect line
87°07'45", 32°22'30"	Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere
4276 000 mN	1000-meter Universal Transverse Mercator grid values, zone 11N
600000 FT	5000-foot grid ticks: California State Plane coordinate system, zone V (FIPSZONE 0405), Lambert Conformal Conic projection
DX5510 ×	Bench mark (see explanation in Notes to Users section of this FIRM panel)
●M1.5	River Mile

NTS

FEMA FLOOD MAP

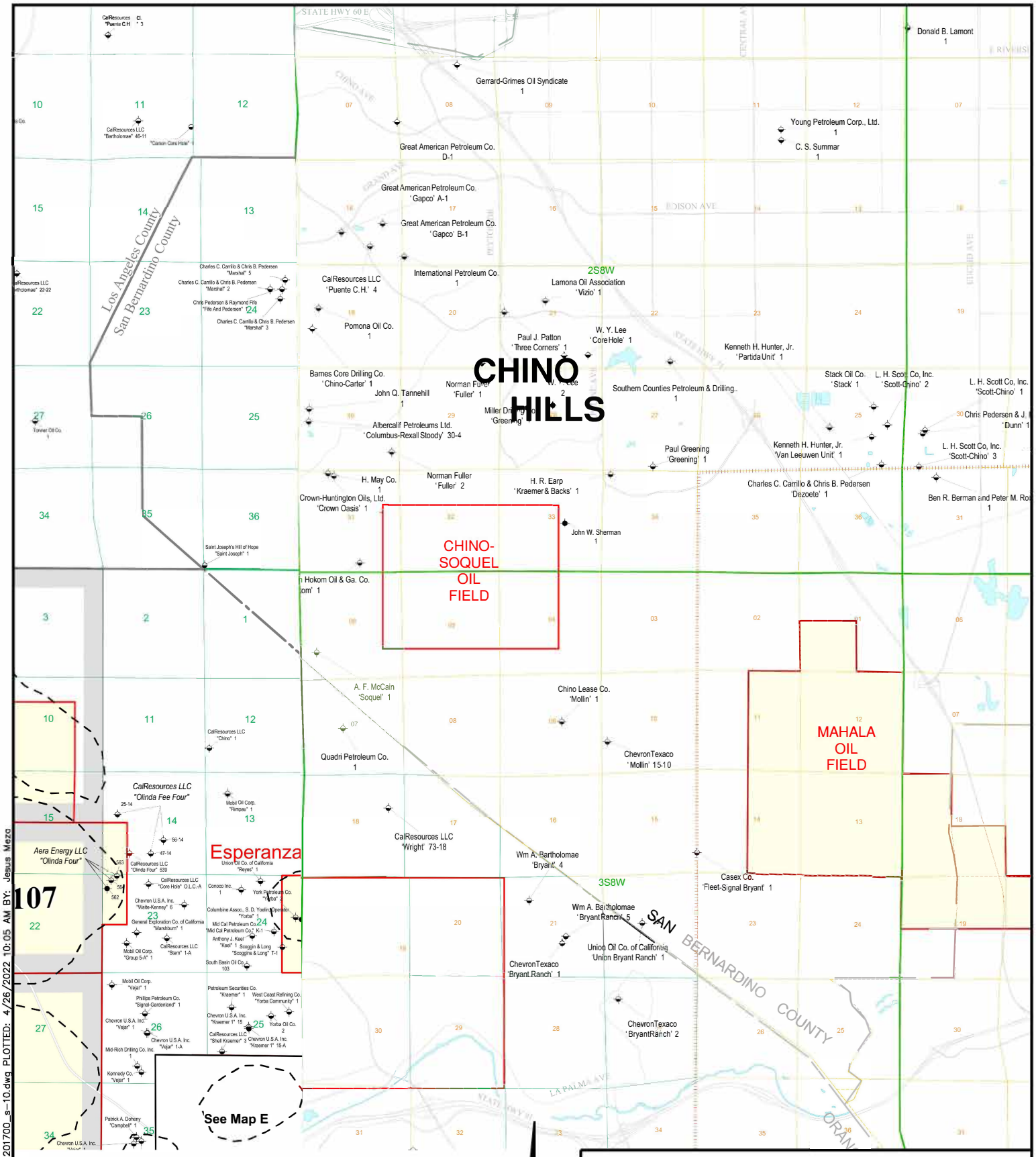
GMU

Date: May 10, 2022

Project No.: 22-017-00

Plate S-9

DRAWING: q:\2022\22-017-00\dwg\2201700_s-9.dwg PLOTTED: 3/17/2022 6:39 AM BY: Jesus Meza



State of California - Department of Conservation
Division of Oil, Gas, and Geothermal Resources

LEGEND

- Drilling
- Drilling- idle
- Plugged and abandoned - dry hole
- Completed - oil
- Idle - oil
- Buried idle
- Plugged and abandoned - oil
- Completed - gas
- Idle - gas
- Plugged and abandoned - gas
- Plugged and abandoned - oiland gas
- Gas - open tooil zone
- Gas injection
- Gas storage
- Gas - converted to waterdisposal
- Abandoned oil - converted to water disposal
- Completed - waterflood
- Completed - water disposal
- Water source
- Observation
- Abandoned - conductor
- Township boundary
- Surveyed section
- Projected section
- Field boundary
- Productive Limit boundary

NTS

Oil Fields in the Chino Hills Area

GMU

Date: May 10, 2022

Project No.: 22-017-00

Plate S-10

DRAWING: c:\2022\22-017-00\dwg\2201700_s-10.dwg PLOTTED: 4/26/2022 10:05 AM BY: Jesus Mezo

APPENDIX L: PALEONTOLOGICAL REPORT

PALEONTOLOGICAL RESOURCES TECHNICAL REPORT FOR THE CHINO HILLS GENERAL PLAN UPDATE

NOVEMBER 2023

PREPARED FOR

EcoTierra Consulting, Inc.

PREPARED BY

SWCA Environmental Consultants

PALEONTOLOGICAL RESOURCES TECHNICAL REPORT FOR THE CHINO HILLS GENERAL PLAN UPDATE CITY OF CHINO HILLS, CALIFORNIA

Prepared for

EcoTierra Consulting, Inc.
5776-D Lindero Canyon Road #414
Westlake Village, California 91362
Attn: Curtis Zacuto

Bobbette Biddulph, B.S., Project Manager
Mathew Carson, M.S., Paleontology Team Lead
Kristina Akesson, B.S., Staff Paleontologist
Russell Shapiro, Ph.D., Principal Investigator

SWCA Environmental Consultants
320 North Halstead Street, Suite 120
Pasadena, California 91107
(626) 240-0587
www.swca.com

SWCA Project No. 66884

November 2023

CONTENTS

1 Introduction 1
2 Project Location 1
3 Project Description 4
3.1 General Plan Update Overview 4
3.2 Housing Element, RHNA Sites, and Related Project Actions 4
4 Professional Standards 7
5 Regulatory Setting 9
5.1 State Regulations 9
5.1.1 California Environmental Quality Act 9
5.1.2 California Public Resources Code 9
5.2 Local Guidance 10
5.2.1 City of Chino Hills General Plan 10
6 Methods 10
6.1 Existing Data Analysis 10
6.2 Reconnaissance Survey 11
6.3 Paleontological Potential Classification 11
7 Existing Conditions 12
7.1 Regional Geology 12
7.2 Local Geology and Paleontology 13
7.2.1 Alluvial and Surficial Deposits (Qvof, Qvoa, Qoa, Qyf, Qya, Qyw, Qyls, Qyf_3, Qyf_5, Qw, Qls) 14
7.2.2 Puente Formation (Tplv, Tpsq, Tpy, Tpsc) and Sandstone and Conglomerate in Southeast Chino Hills (Tch) 16
7.2.3 Topanga Group, Undifferentiated (Tt) 17
7.2.4 Vaqueros and Sespe Formations, Undifferentiated (Tvs) 18
7.2.5 Geology of the RHNA Sites 20
7.3 Museum Records Search 22
7.4 Reconnaissance Survey of the RHNA Sites 24
7.5 Paleontological Potential of the Study Area 30
8 Impact Assessment 33
9 Recommended Impact Avoidance and Minimization Measures 34
9.1 Measures Applying to Development Projects in General Plan Study Area 34
9.2 Measures for RHNA Sites 34
10. Literature Cited 37

Appendices

Appendix A. San Bernardino County Museum Paleontological Records Search (CONFIDENTIAL)
Appendix B. Natural History Museum of Los Angeles County Paleontological Records Search (CONFIDENTIAL)
Appendix C. RHNA Sites – Geologic Maps
Appendix D. RHNA Sites – Paleontological Sensitivity Maps

Figures

Figure 1. Project vicinity with the Chino Hills city limits and General Plan study area and the RHNA site locations within San Bernardino County. 2
Figure 2. Project location with Chino Hills city limits and General Plan study area and RHNA site locations plotted on a 2021 aerial photograph. 3
Figure 3. Geologic map of the Chino Hills city limits and General Plan study area and RHNA site locations. 19
Figure 4. Overview of RHNA Site 1 The Shoppes II, showing land topography, disturbed surface, and ground cover; facing north. Geologic mapping could not be confirmed due to ground cover. 26
Figure 5. Overview of RHNA Site 2 Community Park Overflow, showing land topography and disturbed surface of reworked sediments, possibly from middle Holocene young alluvial-fan deposits, Unit 3 or Miocene Puente Formation, Yorba and Soquel Members; facing west. 27
Figure 6. Overview of RHNA Site 3 Los Serranos Golf Course, showing land topography within the golf course; facing east. Area mapped as middle to early Pleistocene very old alluvial-fan deposits within the channel crossing the site yielded nonsignificant fossil fish scales (F20220623-66884-KA01), preserved within an eroded clast originating from the Miocene Puente Formation. 27
Figure 7. Fossil locality (F20220623-66884-KA01) from middle to early Pleistocene very old alluvial-fan deposits recovered from RHNA Site 3 Los Serranos Golf Course. Fossil material consists of poorly preserved fish scales, which are nonsignificant and therefore not collected. 28
Figure 8. Overview of RHNA Site 4 Western Hills Golf Course, showing land topography within the golf course and level of disturbance of vegetation surficial sediments; facing north. Geologic mapping was partially confirmed by limited exposures of the Puente Formation, Soquel Member (Tpsq) present along the stream channel. 28
Figure 9. Overview of RHNA Site 5 Wang (High Density), showing land topography and vegetated cattle pasture; facing south. Geologic mapping could not be confirmed due to ground cover. 29
Figure 10. Overview of RHNA Site 6 The Shoppes, showing previous site development with a parking lot, commercial buildings, and underground utilities; facing north. Geologic mapping could not be confirmed due to ground cover. 29
Figure 11. Overview of RHNA Site 7 The Commons, showing previous site development with a parking lot, commercial buildings, and underground utilities; facing east. Geologic mapping could not be confirmed due to ground cover. 30
Figure 12. Paleontological sensitivity of the Chino Hills city limits and General Plan study area and RHNA site locations. 31

Tables

Table 1. SBCM and NHMLA Fossil Localities within or near the City of Chino Hills 22

1 INTRODUCTION

On behalf of the City of Chino Hills (City), EcoTierra Consulting, Inc. (EcoTierra) retained SWCA Environmental Consultants (SWCA) to conduct a paleontological resources assessment for the Chino Hills General Plan Update (project) in the city of Chino Hills, San Bernardino County, California (Figure 1). A major component of the General Plan Update is to implement the City's 6th Cycle Housing Element for the 2021-2029 planning period (Housing Element). The project also includes updates to the existing Land Use, Circulation, Safety, Conservation, Parks/Recreation/Open Space, Noise and Economic Development Elements. The project also includes rezoning of the Housing Element opportunity sites to meet the City's Regional Housing Needs Assessment (RHNA) allocations, and revisions to the General Plan Land Use Map and Zoning map. The Housing Element identifies 19 RHNA sites to meet the City's "lower income," "moderate income," and "above moderate income" RHNA allocation. Of those sites, eleven require a General Plan Land Use Map change accomplished through the General Plan Update process. These eleven sites also require a rezoning or specific plan amendment to ensure consistency with the changed General Plan Land Use Map designations.

The City requires this study to consider potential impacts this project may have on significant biological resources to comply with the California Environmental Quality Act (CEQA) and California State (State) and local regulations. The City prepared a comprehensive update to its General Plan in 2015 and a General Plan Environmental Impact Program Report (PEIR), which was certified in 2015. With this current update process, the City is preparing a Subsequent Program EIR (SPEIR), which is required since the General Plan Update proposes substantial changes to the City's 2015 General Plan. The SPEIR will consider whether this current General Plan Update would result in new significant impacts not identified in the 2015 Chino Hills General Plan Update PEIR (City of Chino Hills 2015b).

This assessment, which also serves as baseline information for the City General Plan update, analyzes the Chino Hills city limits at a program level and the RHNA sites at a more detailed, site-specific level. As part of the overall study, SWCA reviewed geologic maps, scientific literature, and confidential fossil locality records from the San Bernardino County Museum (SBCM) and the Natural History Museum of Los Angeles County (NHMLA). As part of the project-level analysis of the RHNA sites, SWCA conducted a pedestrian- and windshield-level field reconnaissance survey for the high- and medium-density sites and site-specific desktop review for the two low-density sites. This technical report includes a discussion of potential impacts to paleontological resources that could result from total build-out and includes mitigation recommendations to reduce potential impacts to less-than-significant levels, pursuant to CEQA.

2 PROJECT LOCATION

The overall study area for the General Plan Update includes the city of Chino Hills' incorporated boundary and sphere of influence, which encompasses approximately 45 square miles in southwestern San Bernardino County (Figure 1 and Figure 2). The city is bounded by the cities of Diamond Bar and Pomona to the north, the city of Chino to the east, the city of Corona and the Fremont Canyon Nature Preserve to the south, and the cities of Yorba Linda and Brea to the west. The General Plan Update study area is found within the San Dimas, Ontario, Yorba Linda, Prado Dam, and Black Star Canyon, California, U.S. Geological Survey 7.5-minute quadrangles.

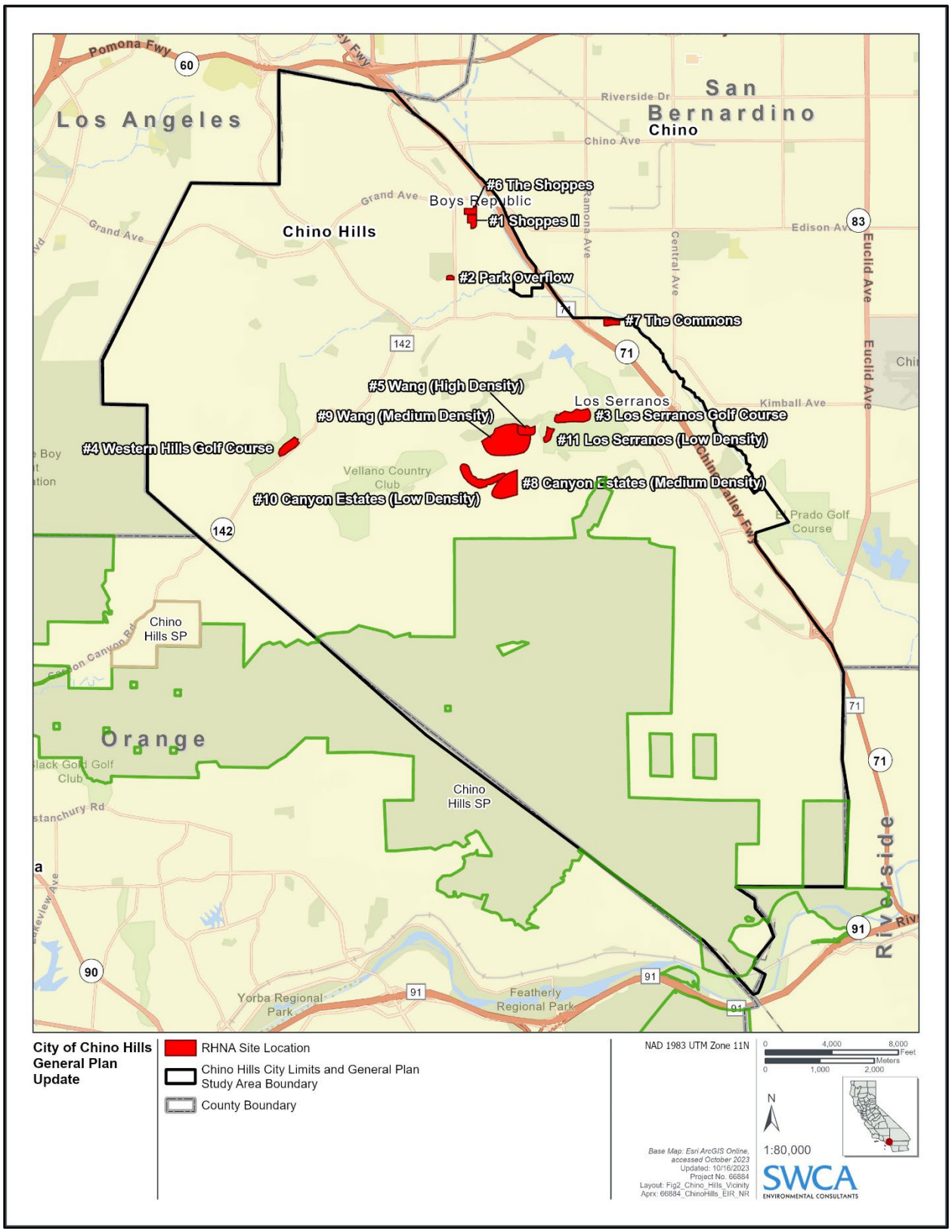


Figure 1. Project vicinity with the Chino Hills city limits and General Plan study area and the RHNA site locations within San Bernardino County.

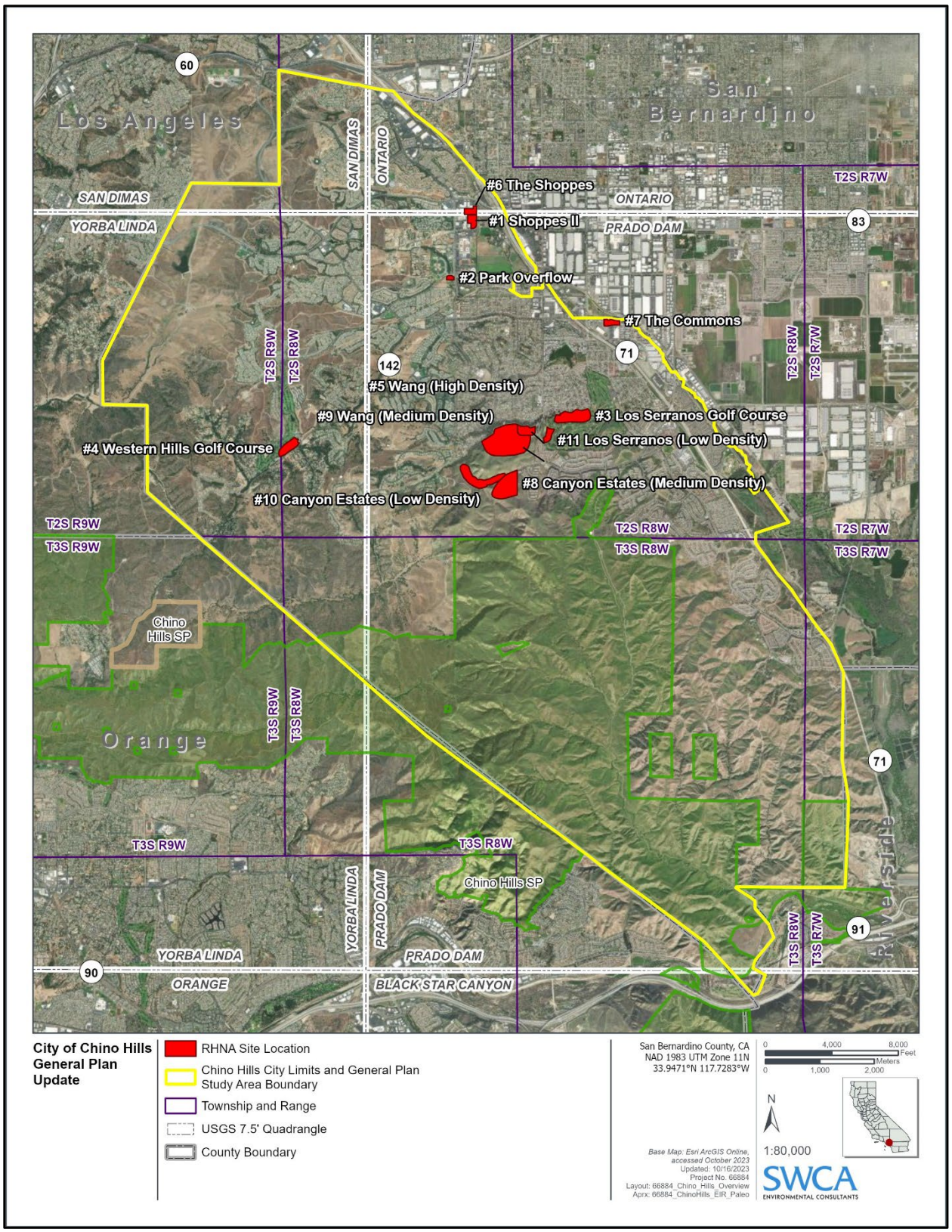


Figure 2. Project location with Chino Hills city limits and General Plan study area and RHNA site locations plotted on a 2021 aerial photograph.

In addition to the broader General Plan Update study area, this assessment provides additional analysis for eleven RHNA sites that will require General Plan Land Use Map amendments. Seven of the sites are suitable for very high density and/or lower income housing: The Shoppes II, Community Park Overflow, Los Serranos Golf Course, Western Hills Golf Course, Wang (High Density), The Shoppes, and The Commons. Two sites are suitable for medium density and/or moderate income housing: Canyon Estates (Medium Density), and Wang (Medium Density). The remaining two sites are suitable for low density residential: Canyon Estates (Low Density) and Los Serranos Golf Course (Low Density). These eleven sites are assessed in this technical analysis at a greater level of detail (as compared to the rest of the General Plan Update study area) to facilitate development of the sites to meet the City's share of regional housing needs. For the seven very high density/lower income sites, field level surveys are conducted to further facilitate and streamline their subsequent development review.

3 PROJECT DESCRIPTION

3.1 General Plan Update Overview

The project consists of updates to the City's 2015 General Plan, which incorporates the City of Chino Hills adopted 2021–2029 Housing Element, and updates the existing Land Use, Circulation, Safety, Conservation, Parks/Recreation/Open Space, Noise and Economic Development Elements. The project also includes rezoning of the Housing Element opportunity sites to meet the City's Regional Housing Needs Assessment (RHNA) allocations, and revisions to the City's Zoning Code and Zoning Map.

3.2 Housing Element, RHNA Sites, and Related Project Actions

The Housing Element is one of the seven mandated elements of the General Plan. State law requires that all Cities adopt a Housing Element and describes in detail the necessary contents of the Housing Element. This Housing Element responds to those requirements within the context of the physical and socioeconomic conditions unique to the city and covers the 8-year planning cycle from 2021–2029, identified by the State as the 6th Cycle Housing Element. A major component of the Housing Element is the identification of sites for future housing development and evaluation of the adequacy of these sites for fulfilling the City's fair share of regional housing needs, which is based on the Southern California Association of Governments' RHNA. The RHNA represents the minimum number of housing units for which each community is required to provide "adequate sites" through planning and zoning and is one of the primary threshold criteria necessary to achieve California Department of Housing and Community Development approval of the Housing Element. The City plans to fulfill its share of regional housing needs by using a combination of current project entitlements or applications for sites currently zoned for residential development, increasing density on property currently zoned for residential development, and rezoning of vacant and underutilized non-residential properties to allow for residential or mixed-use development.

The City's total RHNA for the 2021–2029 planning period is 3,729 units. Of these 3,729 RHNA units, 2,209 are designated for very high density residential, at a density that the State of California deems appropriate to accommodate housing affordable to "lower income households"; 789 of the RHNA units are designated medium density residential, at a density reasonably affordable to "moderate income" households; and 731 of the RHNA units are designated low density residential, at a density typically affordable to "above moderate" income households. The City has identified eleven RHNA sites within its

boundaries that could have the potential for new residential development within the eight-year timeframe of this planning period.

As part of the project, the Land Use Element of the General Plan would be updated to reflect new opportunity sites to meet the RHNA allocation as identified in the Housing Element. This would include three new land use categories: Medium Density Housing Overlay, Very High Density Housing Overlay, and Mixed Use Housing Overlay. These new residential categories would accommodate the RHNA allocation and would include rezoning seven sites to Very High Density Housing Overlay or Mixed Use Housing Overlay or equivalent to provide the necessary very high density sites to accommodate units affordable to lower-income households; and two properties to Medium Density Housing Overlay or equivalent to provide medium density sites to accommodate units affordable to moderate- income households.

Lower-income sites that require rezoning, new land use categories, and/or land use designation adjustments include:

> **Site 1 – The Shoppes II:** This site is City owned and zoned for high-density residential use. The current specific plan caps the site at 295 units; therefore, the site would need to be rezoned to increase the maximum housing density to 93 dwelling units per acre. The small southern portion of the Shoppes II site was included in previous RHNA cycles and remained vacant. The site is flat and situated between the existing Shoppes commercial center to the north, Chino Valley Fire District Station 62 to the south, City Hall and parking structure to the west, and Boys Republic to the east. The entire site will be rezoned to Mixed Use Housing Overlay.
>
> **Site 2 – Community Park Overflow:** The site is City owned and was intended to accommodate overflow parking for the Community Park; however, the site is vacant and underutilized. The City has focused this site on an affordable senior housing development for several years and committed to applying its Housing In-Lieu fee and available funds to help finance the development of this site. The site is located between Community Park to the north and west, and single-family residential development to the east and south. The site will be rezoned to Very High Density Housing Overlay.
>
> **Site 3 – Los Serranos Golf Course:** This site is privately owned and consists of a 9-hole area of an existing 36-hole golf course. The golf course is surrounded by single-family residential development which serves local and regional communities and includes a driving range and country club. The golf course has been underperforming in recent years, and the property owner has been actively pursuing converting the southernmost 9-hole area into housing. Although the property is larger than 10 acres, the project would include a parcel map with entitlements to subdivide into a smaller parcel of adequate size to accommodate high density for lower income RHNA. The high density portion of this property would be rezoned to Very High Density Housing Overlay to allow for owner-occupied and rental multifamily uses by-right..
>
> **Site 4 – Western Hills Golf Course:** This site is privately owned and consists of an 18-hole golf course established in the early 1960s to serve the local and regional communities and includes a country club. The golf course is located within Carbon Canyon and is surrounded by single-family residential development. In recent years, the golf course has underperformed, and the owner seeks to redevelop the south section of the golf course (which includes clubhouse, parking, and large open grass areas) to residential development and redesign the balance of the golf course for continued golf use. Although the golf course is larger than 10 acres, the project would include a parcel map with entitlements to subdivide into a smaller parcel of adequate size to accommodate

high density for lower income RHNA. The designated housing portion of the site will be rezoned to Very High Density Housing Overlay.

Site 5 – Wang (High Density): The site is privately owned and is a vacant, residentially zoned property surrounded by single-family residential to the north and west, vacant property to the south, and Los Serranos Golf Course to the east. Although the site contains areas of steep topography, the mild slope portions can accommodate development for high-density residential. Development of this site would realign Woodview Road to enhance public safety and traffic circulation. Although the property is larger than 10 acres, the project would include a parcel map with entitlements to subdivide into a smaller parcel of adequate size to accommodate high density for lower income RHNA. The designated very high density residential portion of the site will be rezoned to Very High Density Housing Overlay.

Site 6 – The Shoppes: The site is privately owned and consists of an existing 391,863-square foot commercial center surrounded by the Shoppes II site and City Hall to the south, Boys Republic to the east, commercial center and single-family residential to the west, and commercial center to the north. The property owner intends to redevelop the underutilized southeastern section of the commercial center to a mixed-use development that would retain retail space and include high-density residential. Although the commercial center is larger than 10 acres, the project would include a parcel map with entitlements to subdivide into a smaller parcel of adequate size to accommodate high density for lower income RHNA. The designated housing portion of the site will be rezoned to Mixed Use Housing Overlay.

Site 7 – The Commons: The site is privately owned and consists of an existing 443,272-square foot commercial center surrounded by a mobile home park to the east, single-family and multi-family residential to the west, an existing commercial center to the south, and vacant land to the north, across Chino Hills Parkway. The Chino Hills city limits is contiguous with Chino Hills Parkway directly north of the Commons site. The vacant parcel to the north of Chino Hills Parkway is within the city limits of Chino and is currently zoned for commercial office uses. The property owner intends to redevelop the underutilized portion of the commercial center by developing a mixed-use project to retain retail square footage and include high-density residential. Although the commercial center is larger than 10 acres, the project would include a parcel map with entitlements to subdivide into a smaller parcel of adequate size to accommodate high density for lower income RHNA. The designated housing portion of the site will be rezoned to Mixed Use Housing Overlay.

Moderate-income sites requiring rezoning, new land use categories, and/or land use designation adjustments include:

Site 8 – Canyon Estates (Medium Density): The site is privately owned and located at the terminus of Soquel Canyon Parkway and is surrounded by single-family residential and the vacant Wang site to the north, single-family residential to the west and east, and Chino Hills State Park to the south. City staff worked closely with the property owner and developer to evaluate the site and determine a feasible location to accommodate medium density development. Development of the property would also include key infrastructure as part of the City's circulation element. The designated medium density housing portion of the site will be rezoned to Medium Density Housing Overlay.

Site 9 – Wang (Medium Density): The site is privately owned and consists of a vacant residentially zoned property surrounded by single-family residential to the north and

west, vacant property to the south, and Los Serranos Golf Course to the east. Although the site contains areas of steep topography, the mild slope portions can accommodate development for high density residential. City staff worked closely with the property owner and developer to evaluate the site and determine a feasible location to accommodate high density development. Development of this site would re-align Woodview Road to enhance public safety and traffic circulation. The designated medium density housing portion of the site will be rezoned to Medium Density Housing Overlay.

Low density sites requiring rezoning, new land use categories, and/or land use designation adjustments include:

Site 10 – Canyon Estates (Low Density): The Canyon Estates property is located at the terminus of Soquel Canyon Parkway and is surrounded by single-family residential and the vacant Wang site to the north, single-family residential to the west and east, and Chino Hills State Park to the south. The site includes steep topography on the north and south sections of the property and centered with slopes less than ten percent where development can occur. City staff worked closely with the property owner and developer to evaluate the site and determine a feasible location to accommodate medium density development. Development of the property would also include key infrastructure as part of the City's circulation element. An approximate 31-acre portion of the site would be designated for low density residential with an anticipated density of 6.0 dwelling units per acre.

Site 11 – Los Serranos Golf Course (Low Density): The Los Serranos Golf Course site is approximately 79.9 acres and part of a 9-hole area of an existing 36-hole golf course, zoned for commercial recreation, and owned by Greening Family LLC. The golf course is surrounded by single-family residential development which serves local and regional communities and includes a driving range and country club. The golf course has been underperforming in recent years and the property owner has been actively pursuing converting the southernmost 9-hole area into housing, which is located southeast of Country Club Drive and Pipeline Avenue. An approximate 6.9-acre portion of the site would be designated for low density residential with an anticipated density of 6.0 dwelling units per acre.

In addition to the broader General Plan Update study area, eleven RHNA sites are considered in this technical analysis at a greater level of detail as compared to the rest of the General Plan Update study area to facilitate development of the sites to meet the City's share of regional housing needs. As noted previously, for the seven very high density/lower income sites, field level surveys were conducted to further facilitate and streamline their subsequent development review.

The General Plan Update study area is found within San Dimas, Ontario, Yorba Linda, Prado Dam, and Black Star Canyon, California, U.S. Geological Survey 7.5-minute quadrangles.

4 PROFESSIONAL STANDARDS

The Society of Vertebrate Paleontology (SVP) has established standard guidelines that outline professional protocols and practices for conducting paleontological resource assessments and surveys, monitoring and mitigation, data and fossil recovery, sampling procedures, and specimen preparation, identification, analysis, and curation (SVP 1995, 2010). Most practicing professional mitigation paleontologists in California adhere closely to the SVP's assessment, mitigation, and monitoring requirements as specifically provided in its standard guidelines. Most California state regulatory agencies

with paleontological laws, ordinances, regulations, and standards accept and use the professional standards set forth by the SVP.

As defined by the SVP (2010:11), significant paleontological resources are

> fossils and fossiliferous deposits, here defined as consisting of identifiable vertebrate fossils, large or small, uncommon invertebrate, plant, and trace fossils, and other data that provide taphonomic[1], taxonomic[2], phylogenetic[3], paleoecologic[4], stratigraphic[5], and/or biochronologic[6] information. Paleontological resources are considered to be older than recorded human history and/or older than middle Holocene (i.e., older than about 5,000 radiocarbon years).

Numerous paleontological studies have developed criteria for the assessment of significance for fossil discoveries (e.g., Eisentraut and Cooper 2002; Murphey et al. 2019; Scott and Springer 2003). In general, these studies assess fossils as significant if one or more of the following criteria apply:

1. The fossils provide information on the evolutionary relationships and developmental trends among organisms, living or extinct;
2. The fossils provide data useful in determining the age(s) of the rock unit or sedimentary stratum, including data important in determining the depositional history of the region and the timing of geologic events therein;
3. The fossils provide data regarding the development of biological communities or interaction between paleobotanical and paleozoological biotas;
4. The fossils demonstrate unusual or spectacular circumstances in the history of life; or
5. The fossils are in short supply and/or are in danger of being depleted or destroyed by the elements, vandalism, or commercial exploitation, and are not found in other geographic locations.

Geologic units known to preserve significant fossils or fossil localities are likely to contain additional undiscovered and potentially significant fossils and are generally considered sensitive for paleontological resources throughout their areal and stratigraphic extent. The extent of sensitivity differs from that defined for archaeological resource sites as follows:

> It is extremely important to distinguish between archaeological and paleontological (fossil) resource sites when defining the sensitivity of rock units. The boundaries of archaeological sites define the areal extent of the resource. Paleontological sites, however, indicate that the containing sedimentary rock unit or formation is fossiliferous. The limits of the entire rock formation, both areal and stratigraphic, therefore define the scope of the paleontological potential in each case. (SVP 1995:23)

Many archaeological sites contain features visually detectable on the surface. In contrast, fossils may be present at the surface or at depth within sediments or bedrock. Subsurficial fossils would not be observable or detectable unless exposed by erosion or human activity. In the case of human activity,

[1] Taphonomy: The study of biological and geological processes that occur between the death of an organism and its final state in the rock.
[2] Taxonomy: The study of the morphology and relationships of organisms.
[3] Phylogeny: The pattern of evolution and relationships among organisms.
[4] Paleoecology: The study of single fossil organisms or communities of fossil organisms.
[5] Stratigraphy: The sequence of rocks and of events in geologic time.
[6] Biochronology: Also referred to as biostratigraphy; the dating of rocks by means of fossils.
Definitions from Benton and Harper (2009)

such as project-related ground disturbances within geologic units with a high probability to yield significant fossils, direct or indirect adverse impacts to significant fossils may occur.

In summary, paleontologists cannot know either the quality or quantity of fossils prior to natural erosion or human-caused exposure. As a result, even in the absence of fossils on the surface, it is necessary to assess the sensitivity of geologic units based on their known potential to produce significant fossils elsewhere within the same geologic unit (both within and outside the study area), a similar geologic unit, or whether the unit in question was deposited in a type of environment known to be favorable for fossil preservation. Monitoring by experienced paleontologists greatly increases the probability that fossils will be discovered during ground-disturbing activities and that, if such fossils are determined to be potentially significant, successful mitigation and salvage efforts may be undertaken to prevent adverse impacts to these resources.

5 REGULATORY SETTING

Paleontological resources are limited, nonrenewable resources of scientific, cultural, and educational value and are afforded protection under state and local laws and regulations.

5.1 State Regulations

5.1.1 *California Environmental Quality Act*

CEQA is the principal statute governing environmental review of projects occurring in the state and is codified at Public Resources Code (PRC) Section 21000 et seq. CEQA requires lead agencies to determine if a proposed project would have a significant effect on the environment, including significant effects on paleontological resources. Guidelines for the Implementation of CEQA, as amended December 28, 2018 (Title 14, Chapter 3, California Code of Regulations 15000 et seq.), define procedures, types of activities, persons, and public agencies required to comply with CEQA. Section VII(f) of the Environmental Checklist (Appendix G of the State CEQA Guidelines) asks whether a project would directly or indirectly destroy a unique paleontological resource or site or unique geologic feature.

5.1.2 *California Public Resources Code*

Requirements for paleontological resource management are included in California PRC Division 5, Chapter 1.7, Section 5097.5, which states:

> A person shall not knowingly and willfully excavate upon, or remove, destroy, injure, or deface, any historic or prehistoric ruins, burial grounds, archaeological or vertebrate paleontological site, including fossilized footprints, inscriptions made by human agency, rock art, or any other archaeological, paleontological or historical feature, situated on public lands, except with the express permission of the public agency having jurisdiction over the lands.

These statutes prohibit the removal, without permission, of any paleontological site or feature from land under the jurisdiction of the state or any city, county, district, authority, or public corporation, or any agency thereof. Consequently, local agencies are required to comply with PRC 5097.5 for their own activities, including construction and maintenance, as well as for permit actions (e.g., encroachment permits) undertaken by others. PRC 5097.5 also establishes the removal of paleontological resources as a misdemeanor and requires reasonable mitigation of adverse impacts to paleontological resources from developments on public (i.e., state, county, city, and district) land.

5.2 Local Guidance

5.2.1 *City of Chino Hills General Plan*

In the Conservation Element of the City of Chino Hills General Plan, the City recognizes paleontological resources in Section E: Conservation Element Issues, Section 9: Cultural and Paleontological Resources, which establishes the need for paleontological resource considerations during project development (City of Chino Hills 2015a). The General Plan contains one goal (Goal CN-2) aimed at the protection of historic, cultural, and paleontological resources, with the following policy and three actions pertinent to the protection of paleontological resources:

- **Policy CN-2.2:** Protect Chino Hills' paleontological resources.
  - **Action CN-2.2.1:** Require appropriate paleontological surveys as part of the environmental review process where paleontological resources may be present.
  - **Action CN-2.2.2:** Where paleontological resources are found during development activities, require on-site inspections by a qualified paleontologist during grading activities where paleontological resources may be present.
  - **Action CN-2.2.3:** Require identified paleontological materials to be preserved, restored, cataloged, and/or transmitted to the appropriate repository or as otherwise directed by a qualified professional paleontologist.

6 METHODS

The following sections present an overview of the methodology used to analyze the potential for paleontological resources within the study area (the city limits and the RHNA sites). This report conforms to industry standards as developed by the SVP (1995, 2010) and best practices in mitigation paleontology (Murphey et al. 2019). This paleontological resources assessment analyzes the city limits at a program level and the eleven RHNA sites at a project level. This study also incorporates the results of the previous paleontological resources assessment conducted by Cogstone Resource Management (Cogstone) (2011) for the City's 2015 General Plan. SWCA supplemented the project-level desktop review of the eleven RHNA sites with a field reconnaissance survey of seven of the eleven RHNA sites. The purpose of this assessment is to 1) determine if any previously recorded fossil localities are present within the study area; 2) if so, assess the potential for disturbance of these localities during construction; and 3) evaluate the paleontological potential of the geologic units within the study area. SWCA used these data to reassess the paleontological potential of the study area and to determine the potential for adverse impacts to paleontological resources due to implementation of the project.

6.1 Existing Data Analysis

SWCA conducted an analysis of available existing data pertinent to paleontological resources within the study area and its vicinity. This analysis included a review of the previous paleontological resources assessments prepared by Cogstone (2011), as well as an updated desktop review of geologic mapping, scientific literature, and museum records searches from the NHMLA and SBCM. Geologic mapping used in this analysis is by Morton and Miller (2006) at a scale of 1:100,000. SWCA requested museum records retained by the SBCM and the NHMLA, the results of which are summarized in Section 7.3 of this report. A full copy of the museum records search results from the SBCM and the NHMLA are included in confidential Appendix A and Appendix B, respectively.

6.2 Reconnaissance Survey

SWCA conducted a pedestrian- and windshield-level field reconnaissance survey of seven of the eleven RHNA sites to supplement the project-level analysis. Four of the eleven RHNA sites were not subject to a field survey, at the City's request. The survey was conducted on June 23, 2022, by SWCA Staff Paleontologist Kristina Akesson, B.S., under the supervision of SWCA Paleontology Team Lead Mathew Carson, M.S. The purpose of the reconnaissance survey was to 1) confirm the geologic mapping by Morton and Miller (2006); 2) assess the status of previously recorded paleontological localities noted in the museum records search results within the RHNA sites, if any; 3) inspect exposures of previously undisturbed sediments or bedrock outcrops within the RHNA sites, if any, to assess their potential to preserve paleontological resources; and 4) record newly identified or previously unrecorded paleontological localities that may be present within the RHNA sites, if any. The results of the reconnaissance survey are incorporated into Section 7 of this report.

6.3 Paleontological Potential Classification

The results of the geologic map review, scientific literature review, museum records search, and pedestrian reconnaissance survey were used to assign and/or confirm the paleontological potential of the geologic units within the city. Paleontological potential, or sensitivity, is defined as the potential for a geologic unit to produce scientifically significant fossils. This is determined by rock type, history of the geologic unit in producing significant fossils, and fossil localities previously recorded from that unit. Paleontological sensitivity is derived from the known fossil data collected from the entire geologic unit, not just from a specific survey. In its Standard Procedures for the Assessment and Mitigation of Adverse Impacts to Paleontological Resources, the SVP (2010:1–2) defines four categories of paleontological sensitivity for rock units:

> **High Potential**. Rock units from which vertebrate or significant invertebrate, plant, or trace fossils have been recovered are considered to have a high potential for containing additional significant paleontological resources. Rocks units classified as having high potential for producing paleontological resources include, but are not limited to, sedimentary formations and some volcaniclastic formations (e.g., ash or tephra), and some low-grade metamorphic rocks which contain significant paleontological resources anywhere within their geographical extent, and sedimentary rock units temporally or lithologically suitable for the preservation of fossils (e.g., middle Holocene and older, fine-grained fluvial sandstone, argillaceous and carbonate-rich paleosols, cross-bedded point bar sandstone, fine-grained marine sandstone, etc.). Paleontological potential consists of both a) the potential for yielding abundant or significant vertebrate fossils or for yielding a few significant fossils, large or small, vertebrate, invertebrate, plant, or trace fossils and b) the importance of recovered evidence for new and significant taxonomic, phylogenetic, paleoecologic, taphonomic, biochronologic, or stratigraphic data. Rock units which contain potentially datable organic remains older than late Holocene, including deposits associated with animal nests or middens, and rock units which may contain new vertebrate deposits, traces, or trackways are also classified as having high potential.
>
> **Low Potential**. Paleontological literature or field surveys by a qualified professional paleontologist may allow determination that some rock units have low potential for yielding significant fossils. Such rock units will be poorly represented by fossil specimens in institutional collections or based on general scientific consensus only preserve fossils in rare circumstances and the presence of fossils is the exception not the

rule, e.g., basalt flows or Recent colluvium. Rock units with low potential typically will not require impact mitigation measures to protect fossils.

Undetermined Potential. Rock units for which little information is available concerning their paleontological content, geologic age, and depositional environment are considered to have undetermined potential. Further study is necessary to determine if these rock units have high or low potential to contain significant paleontological resources. A field survey by a qualified professional paleontologist to specifically determine the paleontological resource potential of these rock units within the project area is required before a paleontological resource impact mitigation program can be developed. In cases where no subsurface data are available, paleontological potential can sometimes be determined by strategically located existing excavations into subsurface stratigraphy.

No Potential. Some rock units have no potential to contain significant paleontological resources, for instance high-grade metamorphic rocks (such as gneisses and schists) and plutonic igneous rocks (such as granites and diorites). Rock units with no potential require no protection or impact mitigation measures relative to paleontological resources. (SVP 2010:1–2)

7 EXISTING CONDITIONS

7.1 Regional Geology

California consists of 11 geomorphic provinces[7], each of which has its own characteristic geology, topography, and climate (California Geological Survey [CGS] 2002; Norris and Webb 1990). Of these geomorphic provinces, the Peninsular Ranges Geomorphic Province is located in Southern California and is bounded on the north by the Transverse Ranges; on the east by the Transverse Ranges, Mojave Desert, and Colorado Desert; and on the west by the continental shelf under the Pacific Ocean (CGS 2002; Norris and Webb 1990). Norris and Webb (1990) characterize the Peninsular Ranges as a series of northwest-trending, fault-bound blocks, each of which contains uplifted ranges or subsided valleys (CGS 2002; Norris and Webb 1990).

The study area is located in the northernmost portion of the Peninsular Ranges (sometimes classified as the southern extent of the Transverse Ranges) along the northeastern Los Angeles Basin and is situated within a block referred to by Yerkes and others (1965) as the northeastern block. The northeastern block is bounded on the north by the Sierra Madre and Cucamonga fault zones, on the southwest by the Whittier and Elsinore fault zones, and on the east by the Chino Fault (Morton and Miller 2006; Yerkes 1972; Yerkes et al. 1965). Tectonic forces associated with movement along local faults within the northeastern block resulted in the development of the Puente Hills. The Puente Hills consist of Miocene- to Pliocene-aged marine strata uplifted as low-lying hills that are bounded on the northwest by the San Gabriel Valley; on the northeast by the San Bernardino Valley; and on the southwest by the Santa Ana coastal plain, La Habra Valley, and Santa Ana River canyon (English 1926). The city of Chino Hills is located within the northeastern-most extension of the Puente Hills referred to as the Chino Hills. Within the combined Puente-Chino Hills region, geologists note up to approximately 24,000 feet of middle and late

[7] The major geomorphic provinces of California include (1) Great Valley of California, (2) Sierra Nevada, (3) Cascade Range, (4) Modoc Plateau, (5) Klamath Mountains, (6) Coast Ranges, (7) Transverse Ranges, (8) Peninsular Ranges (including Los Angeles Basin), (9) Colorado Desert, (10) Mojave Desert, and (11) Basin Range (CGS 2002). The project site is located within the Peninsular Ranges; therefore, the other geomorphic provinces relevant to Southern California are not described in detail within this report.

Miocene- to early Pliocene-aged marine clastic sedimentary rocks, with such geologic units representing the most prolific oil reservoirs throughout the Los Angeles Basin (Morton and Miller 2006; Norris and Webb 1990; Yerkes 1972; Yerkes et al. 1965).

As detailed in Norris and Webb (1990), the geologic history of the Puente-Chino Hills region is tied to the overall geologic history of the larger Los Angeles Basin. During the Late Cretaceous and early Cenozoic (Paleocene through early Miocene), basement rocks were eroded down to sea level and overlain by marine and nonmarine clastic strata[8]. Marine and nonmarine rocks from this time are visible in the Santa Ana and Santa Monica Mountains and presumably extend across the Los Angeles Basin at considerable depth. By the early Miocene, tectonic extension occurred throughout the region due to the shifting plate tectonic boundary, resulting in widespread volcanic activity, as well as faulting and rotating of crustal blocks. During the late Miocene, the sea advanced over the Los Angeles Basin from the south, with the sea reaching the base of the San Gabriel Mountains and connecting the Los Angeles and Ventura basins by the close of the Miocene. However, during the Pliocene, a marked reduction in the rate of subsidence of the central basin occurred and coincided with a marked uplift near basin margins, as well as the deposition of large volumes of sediment eroded and transported away from the rising highlands on the northeast. By the end of the Pliocene, more than 10,000 feet of marine sedimentary deposits had accumulated in the central basin, and terrestrial environments had formed near the modern-day Palos Verdes Hills, Santa Ana and Santa Monica Mountains, Puente-Chino Hills, and small islands along the Inglewood Fault Zone. During the early Pleistocene, the San Gabriel Mountains and the Puente-Chino Hills continued to rise, but by the middle Pleistocene sedimentary deposition outpaced tectonic subsidence within the Los Angele Basin, resulting in nearly 3,000 feet of Pleistocene terrestrial to near-shore deposits near the center of the Los Angeles Basin. As global sea levels lowered throughout the Pleistocene due to continental glaciation, sedimentation within the Los Angeles Basin continued, and erosion off the surrounding highlands during the late Pleistocene and Holocene resulted in thick sequences of alluvial and fluvial deposits situated across the basin. Alluvial and fluvial sedimentation continues today (Norris and Webb 1990).

7.2 Local Geology and Paleontology

The previous paleontological resources assessment prepared by Cogstone (2011) for the 2015 General Plan update was based on published geologic mapping by Dibblee (2001) at a scale of 1:24,000. Based on Dibblee's map, middle Miocene Topanga Sandstone, middle Miocene Monterey Formation, late Miocene Sycamore Canyon Formation, and Quaternary (Pleistocene and Holocene) alluvial and landslide deposits are present at the surface within the city (Cogstone 2011). Geologists have extensively researched the geology of the Puente-Chino Hills area due to its prolific oil reserves and complex tectonic history. The geologic units within this area have undergone several reclassifications since their original descriptions around a century ago. Today, practicing geologists in the region prefer the geologic classifications and mapping presented in Morton and Miller (2006) at a scale of 1:100,000, which compiles datasets from smaller-scale geologic maps, provides updated considerations of the relationships among the geologic units in the region, and updates the naming and groupings of geologic units presented by Dibblee (2001) with the most recently accepted classifications. For example, the three members of the middle Miocene Monterey Formation and the late Miocene Sycamore Canyon Formation classified by Dibblee (2001) are combined and reclassified as the four members of the Puente Formation (La Vida, Soquel, Yorba, and Sycamore Canyon members) in Morton and Miller (2006), which retains the original classification of Schoellhamer and others (1954). This preferred scheme is based on the distinct lithology of these units in the Puente-Chino Hills region in comparison to the lithology of the Monterey Formation

[8] Here, "clastic strata" refers to layers of sediments derived from the weathering of older rocks and the subsequent erosion, transportation, and deposition of these sediments that were compressed and cemented together (i.e., lithified) into sedimentary rock.

mapped along the San Joaquin Hills. Therefore, SWCA reviewed and applied the geologic mapping of Morton and Miller (2006) to this updated study.

Updated geologic mapping of the surface of the study area consists of the following geologic units (in geochronological order from youngest to oldest): late Holocene very young landslide deposits (Qls); late Holocene very young wash deposits (Qw); late Holocene young alluvial-fan deposits, Unit 5 (Qyf_5); middle Holocene young alluvial-fan deposits, Unit 3 (Qyf_3); Holocene and late Pleistocene young landslide deposits (Qyls); Holocene and late Pleistocene young wash deposits (Qyw); Holocene and late Pleistocene young axial-channel deposits (Qya); Holocene and late Pleistocene young alluvial-fan deposits (Qyf, undivided and may contain Qyf_5 and Qyf_3); late to middle Pleistocene old axial-channel deposits (Qoa); middle to early Pleistocene very old axial-channel deposits (Qvoa); middle to early Pleistocene very old alluvial-fan deposits (Qvof); early Pliocene and Miocene sandstone and conglomerate in southeast Chino Hills (Tch); early Pliocene and Miocene Puente Formation – Sycamore Canyon Member (Tpsc); Miocene Puente Formation – Yorba Member (Tpy); Miocene Puente Formation – Soquel Member (Tpsq); Miocene Puente Formation – La Vida Member (Tplv); middle Miocene Topanga Group, undifferentiated (Tt); and early Miocene, Oligocene, and late Eocene Vaqueros and Sespe Formations (Tvs) (Morton and Miller 2006). The geologic units are summarized below and depicted in the city-wide geologic map in Figure 3. Focused geologic mapping at each of eleven RHNA sites is presented in Appendix C.

7.2.1 *Alluvial and Surficial Deposits (Qvof, Qvoa, Qoa, Qyf, Qya, Qyw, Qyls, Qyf_3, Qyf_5, Qw, Qls)*

Geologic mapping by Morton and Miller (2006) indicates that the city is underlain by several Holocene and/or Pleistocene alluvial and surficial deposits (see Figure 3). These geologic units include late Holocene very young landslide deposits (Qls); late Holocene very young wash deposits (Qw); late Holocene young alluvial-fan deposits, Unit 5 (Qyf_5); middle Holocene young alluvial-fan deposits, Unit 3 (Qyf_3); Holocene and late Pleistocene young landslide deposits (Qyls); Holocene and late Pleistocene young wash deposits (Qyw); Holocene and late Pleistocene young axial-channel deposits (Qya); Holocene and late Pleistocene young alluvial-fan deposits (Qyf, undivided and may contain Qyf_5 and Qyf_3); late to middle Pleistocene old axial-channel deposits (Qoa); middle to early Pleistocene very old axial-channel deposits (Qvoa); and middle to early Pleistocene very old alluvial-fan deposits (Qvof). Morton and Miller (2006) provide descriptions of these geologic units below.

- Late Holocene very young landslide deposits (Qls) consist of chaotically mixed soil, rubble, and displaced bedrock that formed via debris slides or earth slumps.
- Late Holocene very young wash deposits (Qw) consist of unconsolidated sand and gravel deposits in active washes, ephemeral river channels axial-valley streams, and channels on active surfaces of alluvial fans, all of which may be reworked during winter precipitation or flash flood events. Sediments of these deposits form from the erosion and reworking of local, older alluvial deposits.
- Late Holocene young alluvial-fan deposits, Unit 5 (Qyf_5) consist of unconsolidated to slightly consolidated coarse-grained sand to boulder alluvial-fan deposits, having slightly dissected to essential undissected surfaces. The age of the young alluvial-fan deposits is based on relative position in terrace riser sequence, superposition, and overlapping relations of adjacent fans.
- Middle Holocene young alluvial-fan deposits, Unit 3 (Qyf_3) consist of brown, slightly to moderately consolidated silt, sand, and coarse-grained sand to boulder alluvial-fan deposits, having slightly to moderately dissected surfaces. The surfaces of these deposits are gently rolling and may be incised by large washes incised to depths as great as 13 feet.

- Holocene and late Pleistocene young landslide deposits (Qyls) consist of chaotically mixed soil, rubble, and displaced bedrock that formed as a result of debris slides or earth slumps. These deposits are abundant in areas where the Puente Formation in the Chino Hills area has failed, resulting in debris flows deposits overlying older Puente Formation.
- Holocene and late Pleistocene young wash deposits (Qyw) consist of unconsolidated to slightly consolidated sand and gravel deposits in marginal parts of active and recently active washes and ephemeral river channels of axial-valley streams. This unit differs from younger wash deposits (described above) by an absence of flood scours, modified channel-and-bar morphology, and immature soil horizons.
- Holocene and late Pleistocene young axial-channel deposits (Qya) consist of slightly to moderately consolidated silt, sand, and gravel deposits.
- Holocene and late Pleistocene young alluvial-fan deposits (Qyf) consist of unconsolidated to moderately consolidated silt, sand, pebbly-cobbly sand, and boulder alluvial-fan deposits, which have slightly to moderately dissected surfaces. Close to the mountainous regions from which they originate, the young alluvial-fan deposits consist of cobble- to boulder-sized clasts, decreasing in size to mixed silt, medium-grained sand, and pebbly sand. This unit is undifferentiated but can be divided into seven subunits; Unit 5 (Qyf_5) and Unit 3 (Qyf_3) are described above and are mapped separately (see above).
- Late to middle Pleistocene old axial-channel deposits (Qoa) consist of moderately to well consolidated silt, sand, and gravel having moderate to well developed overlying soil. These deposits are mapped at the surface along the east sides of Aliso, Bane, Slaughter, and Aberhall canyons.
- Middle to early Pleistocene very old axial-channel deposits (Qvoa) consist of alluvial sands, with scattered gravel and pebbles layers, as well as silt and clay. Typically, these deposits are reddish brown and well consolidated to moderately to well-indurated.
- Middle to early Pleistocene very old alluvial-fan deposits (Qvof) consist of moderately to well consolidated silt, sand, gravel, and conglomerate. Throughout most of the region, these deposits are predominantly medium- to coarse-grained sand and silt deposits, which are orangish brown and well dissected at the surface.

Late Holocene sediments are typically regarded as too young (i.e., less than 5,000 years old) to contain fossils (SVP 2010); however, they may transition at depth to middle to early Holocene and/or Pleistocene deposits that have the potential to yield scientifically important fossils. Within their paleontological resources assessment for the 2015 General Plan update, Cogstone (2011) conducted a review of City-held reports for 19 development projects and requested museum records search results from the NHMLA and SBCM. Although Cogstone (2011) does not differentiate the fossil localities by geologic unit, Pleistocene-age fossil localities from within the city are tabulated. Based on the results of Cogstone's (2011) study, fossil localities from Pleistocene-age deposits have yielded bison, deer, horses, mammoths, ground sloths, and rodents. In general, Pleistocene terrestrial alluvial deposits have a rich fossil history in Southern California (Brattstrom 1961; Jefferson 1991a, 1991b; McDonald and Jefferson 2008; Miller 1971; Paleobiology Database 2022; Reynolds and Reynolds 1991; Springer et al. 2009; University of California Museum of Paleontology 2022). The most common Pleistocene terrestrial mammal fossils include the bones of mammoth, bison, deer, and small mammals, but other taxa, including horse, lion, cheetah, wolf, camel, antelope, peccary, mastodon, capybara, and giant ground sloth, have been reported (Graham and Lundelius 1994), as well as frogs, salamanders, and snakes (Hudson and Brattstrom 1977). In addition to illuminating the striking differences between Southern California in the Pleistocene and Southern California today, this abundant fossil record has been vital in studies of extinction (e.g., Barnosky et al. 2004; Sandom et al. 2014; Scott 2010), ecology (e.g., Connin et al. 1998), and climate change (e.g., Roy et al. 1996).

7.2.2 Puente Formation (Tplv, Tpsq, Tpy, Tpsc) and Sandstone and Conglomerate in Southeast Chino Hills (Tch)

Geologic mapping by Morton and Miller (2006) indicates that most of the city is underlain by the early Pliocene and Miocene Puente Formation, which includes four members: La Vida Member (Tplv), Soquel Member (Tpsq), Yorba Member (Tpy), and the Sycamore Canyon Member (Tpsc) (see Figure 3). Additionally, the southeastern portion of the city is underlain by an informal geologic unit referred to by Morton and Miller (2006) as the early Pliocene and Miocene sandstone and conglomerate in southeastern Chino Hills (Tch), which has similar lithology to the Sycamore Canyon Member of the Puente Formation and may be coeval in part (Durham and Yerkes 1964). Therefore, the Puente Formation (and its member) and the sandstone and conglomerate in southeast Chino Hills are discussed together here.

Local geologists have assessed the uplifted marine rocks throughout the Puente-Chino Hills region due to their oil reserves, resulting in numerous revisions of their subdivisions and ranking. The Puente Formation was originally named and described by Eldridge and Arnold (1907) and later subdivided by English (1926) into three units based on lithology. Later, Daviess and Woodford (1949) and Schoellhamer and others (1954) further subdivided the Puente Formation within the Puente-Chino Hills region into four members (from youngest to oldest): 1) Sycamore Canyon Member, 2) Yorba Member, 3) Soquel Member, and 4) La Vida Member, all of which have gradational contacts within the Puente-Chino Hills area and become uniform and indistinguishable westward in the Los Angeles Basin. Conversely, Dibblee (2001) reclassified the Yorba Member, Soquel Member, and La Vida Member as part of the Monterey Formation, with the Sycamore Canyon Member separated and upgraded to the Sycamore Canyon Formation; Cogstone (2011) followed this classification in their paleontological resources assessment. However, because the Monterey Formation is lithologically consistent from the Monterey area to the San Joaquin Hills and is distinct from the Puente Formation, Morton and Miller (2006) retain the classification of Schoellhamer et al. (1954). Within this paleontological resources assessment, SWCA has chosen to follow Morton and Miller's (2006) classification, which is common practice among local geologists.

The Sycamore Canyon Member (Tpsc) is the youngest member and extends from the Miocene to the early Pliocene. It consists of pale gray, thick-bedded to massive, medium- to coarse-grained, friable sandstone; pale gray, thinly bedded, siliceous siltstone; pale gray, poorly bedded siltstone; and brownish gray, massive conglomerate (Morton and Miller 2006). According to Yerkes (1972), the Sycamore Canyon Member contains a predominately conglomeratic rock of unknown extent, which is not mapped by Morton and Miller (2006) at the surface but may be present in the subsurface. Stratigraphically, the Sycamore Canyon overlies the Yorba Member but likely also includes, at least in part, the Miocene and early Pliocene sandstone and conglomerate in southeastern Chino Hills (Tch), which consists of poorly exposed marine and nonmarine sandstone and conglomerate in folded strata of the Chino Hills portion of the greater Puente Hills, as well as possibly along Wardlow Wash, Bedford Canyon, and Brown Canyon (Durham and Yerkes 1964; Morton and Miller 2006).

The Miocene Yorba Member (Tpy) overlies the Soquel Member and consists of white to gray, thinly bedded, micaceous and siliceous siltstone, containing beds of fine-grained sandstone and limy concretions, and sandy siltstone (Morton and Miller 2006). Geologists have interpreted the Yorba Member as a turbidity current deposit (Durham and Yerkes 1959). Like the Soquel Member, the Yorba Member also contains a local conglomerate; however, the extent of it is unknown (Morton and Miller 2006). The Yorba Member is mapped at the surface along the southern extent of the city, overlying the Soquel and La Vida Members along the south-facing slopes north of the Santa Ana River; along the center of the city between Soquel Canyon and Aliso Canyon; and along the northern extent of the city between Tonner Canyon and Chino Creek.

The Miocene Soquel Member (Tpsq) overlies the La Vida Member and consists of gray to yellowish gray, massive to well-bedded, medium- to coarse-grained, poorly sorted sandstone interbedded with matrix-support pebbly sandstone, and is commonly graded (Morton and Miller 2006). The Soquel Member also contains a local conglomerate (although this subunit is not mapped at the surface of the city) and the basal portions of the member contain ellipsoidal calcite-cemented concretions 1 foot to 4.5 feet in diameter (Morton and Miller 2006). The Soquel Member is exposed along the southern extent of the city on the south-facing slopes of the Puente-Chino Hills along the north bank of the Santa Ana River and exposed throughout the western portion of the city.

The Miocene La Vida Member (Tplv) is the oldest of the members of the Puente Formation; it consists of light gray to black (weathered to white or pale gray), massive to well-bedded, generally friable siltstone, with interbedded sandstone beds ranging from approximately 1 inch to 3 feet thick (Morton and Miller 2006). This unit contains widespread fish fossils and abundant foraminifers, and some beds contain phosphate nodules, sparse limy siltstone, and vitric tuff. Exposures of the La Vida Member are present along the southern extent of the city on the south-facing slopes of the Puente-Chino Hills along the north bank of the Santa Ana River.

Within their paleontological resources assessment for the 2015 General Plan update, Cogstone (2011) conducted a review of City-held reports for 19 development projects and requested museum records search results from the NHMLA and SBCM. Although Cogstone (2011) does not differentiate the fossil localities by geologic unit, Miocene-age fossil localities from within the city are tabulated. Therefore, for the purposes of this updated paleontological resources assessment, SWCA has assumed these Miocene fossil localities are from undifferentiated Puente Formation based on the mapping of the locality information presented in Cogstone's (2011) report. Based on the results of Cogstone's (2011) study, fossil localities from Miocene-age deposits (i.e., undifferentiated Puente Formation) have yielded whales, dolphins (including the extinct Chino Hills dolphin), seals, sea lions, birds, boney fishes, sharks, bivalves, gastropods, crabs, barnacles, brachiopods, algae, and terrestrial plants. The results of SWCA's paleontological assessment included in this report indicates that the Puente Formation (and all its members) has a history of preserving terrestrial fossil taxa, such as rhinoceros, mastodons, rabbits, rodents, and insects, and marine fossil taxa, such as pinnipeds, desmostylids, whales, sharks, bony fish, crustaceans, cephalopods, bivalves, sponges, and foraminifers (Barboza et al. 2017; Carnevale et al. 2008; David 1943; Feldmann 2003; Fritzsche 1980; Hilton and Grande 2006; Huddleston and Takeuchi 2006; Leatham and North 2017; Pajak 1992; Pierce 1945; Pimiento 2014; Rigby and Albi 1996; Santos et al. 2016; Saul and Stadum 2005; Scherzer 2017). Additionally, fossils have been recovered from the sandstone and conglomerate in southeastern Chino Hills informal geologic unit, including marine invertebrate and nonmarine vertebrate faunas and floras (Morton and Miller 2006).

7.2.3 *Topanga Group, Undifferentiated (Tt)*

Geologic mapping by Morton and Miller (2006) indicates that surface exposures of the middle Miocene Topanga Group, undifferentiated (Tt) are present along the southern boundary of the city along the Whittier Fault Zone near its convergence with the Elsinore Fault Zone on the north bank of the Santa Ana River (see Figure 3). Previously referred to as the Topanga Formation or the Topanga Canyon Formation, the Topanga Group consists of middle Miocene rocks overlying the middle Miocene Vaqueros Formation and underlying the late Miocene Modelo Formation, the latter of which is absent from the Puente-Chino Hills region (Morton and Miller 2006). The Topanga Formation was upgraded to "group" rank by Yerkes and Campbell (1979), based on type-strata located within the Santa Monica Mountains. Morton and Miller (2006) retain Yerkes and Campbell's (1979) group ranking but note that the subdivisions within the group notably present outside of the Puente-Chino Hills area are largely undifferentiated. Where subdivided along the north and west sides of the Santa Ana Mountains, San Jose Hills, and San Joaquin Hills, the upgraded members of the original Topanga Formation include the Buzzard Peak Conglomerate; Undivided Topanga Group, Santa Ana Mountains area; San Joaquin Hills, Laguna Beach area; Bommer

Formation; Los Trancos Formation; and Paulerino Formation (Blake 1991; Morton and Miller 2006). Because only undifferentiated strata of the Topanga Group (coeval to Undivided Topanga Group, Santa Ana Mountains area) are present within the city limits, the other subdivisions are not described here. According to Morton and Miller (2006), the Topanga Group, undifferentiated, consists of a basal, well-cemented conglomerate overlain by medium- to coarse-grained sandstone most notably present along the north and west flanks of the Santa Ana Mountains. Overall, the Topanga Group consists of pale tan to yellowish tan, coarse-grained, massive to thick-bedded sandstone and conglomerate, interbedded with fine-grained, thinly bedded sandstone, siltstone, and lesser diatomaceous shale, which is gray to grayish white, fissile, and partly silicified (Morton and Miller 2006). Where undifferentiated within the City, this group is approximately 2,260 feet thick but thins to approximately 10 feet thick east of El Modeno (Morton and Miller 2006).

Biostratigraphers have used marine invertebrate and microscopic fossils from the Topanga Group to aid in biostratigraphy and stratigraphic correlation across Southern California using the following marine invertebrate fossil fauna: gastropods, including *Turritella ocoyana*, *Turritella*. cf. *T. ocoyana topangensis*, and *T. temblorensis*; bivalves, including *Leptopecten andersoni*, *Chione temblorensis*, *Crassostrea* cf. *titan subtitan*, and *Vertipecten nevadanus*, and limited foraminifers (Morton and Miller 2006). Other fossil localities recovered from the Topanga Group include marine/aquatic fossils, such as pinnipeds, whales, dolphins, desmostylids (an extinct group of hippopotamus-like mammals), sirenians, sharks, rays, bivalves, gastropods, and stomatopods (Aranda-Manteca et al. 1994; Boessenecker and Churchill 2013; Domning 1978; Hof and Schram 1998; Howard and Barnes 1987; Powell and Geiger 2019; Stinson et al. 2005; VanderHoof 1937). The Topanga Group has also yielded terrestrial fossils, such as horses, artiodactyls (including camels), rabbits, rodents, and birds (Howard and Barnes 1987; Kelly and Lander 1988).

7.2.4 *Vaqueros and Sespe Formations, Undifferentiated (Tvs)*

Geologic mapping by Morton and Miller (2006) indicates that undifferentiated exposures of the Vaqueros and Sespe Formations (Tvs) are present along the southernmost extent of the city, with small exposures of these units along the Whittier Fault Zone near its convergence with the Elsinore Fault Zone on the north bank of the Santa Ana River (see Figure 3). Overall, exposures of these units at the surface are minimal within the city limits and mostly underlie the Topanga Group (discussed above) (Cogstone 2011; Yerkes 1972; Yerkes et al. 1965). However, they are observed at the surface near the city along the northeast side of the Whittier Fault Zone, where these undifferentiated formations are folded as a syncline, with maximum depths to these deposits varying between 3,000 and 4,000 feet below sea level (Dibblee 2001; Yerkes 1972). The undifferentiated Vaqueros and Sespe Formations range in age, spanning the late Eocene through early Miocene. Where undifferentiated, deposits of the formations consist of red (oxidized), interbedded mudstones, sandstones, and conglomerate, with marine fossil-bearing strata of the Vaqueros Formation interlayered bed-by-bed with the nonmarine Sespe Formation, making it impossible to differentiate the two formations in local geologic mapping (Morton and Miller 2006; Yerkes 1972). However, these units are differentiated at the surface within the San Joaquin Hills in Orange County to the south and in Ventura County to the north. Within the San Joaquin Hills, the Vaqueros Formation consists of brownish gray, massive to thick-bedded sandstone and sandy siltstone, with interbedded siltstone, shale, mudstone, and minor conglomerate and may be as much as 3,800 feet thick. The Sespe Formation in the San Joaquin Hills area is gray to red (i.e., oxidized) and massive to thick bedded, consisting of nonmarine conglomerate, conglomeratic sandstone, and clayey to silty sandstone. Stratigraphically, the Sespe Formation conformably underlies the Vaqueros Formation in Ventura County (Morton and Miller 2006) but is interbedded (and may partially overlie) with the Vaqueros Formation in the Puente-Chino Hills region (Dibblee 2001; Yerkes 1972).

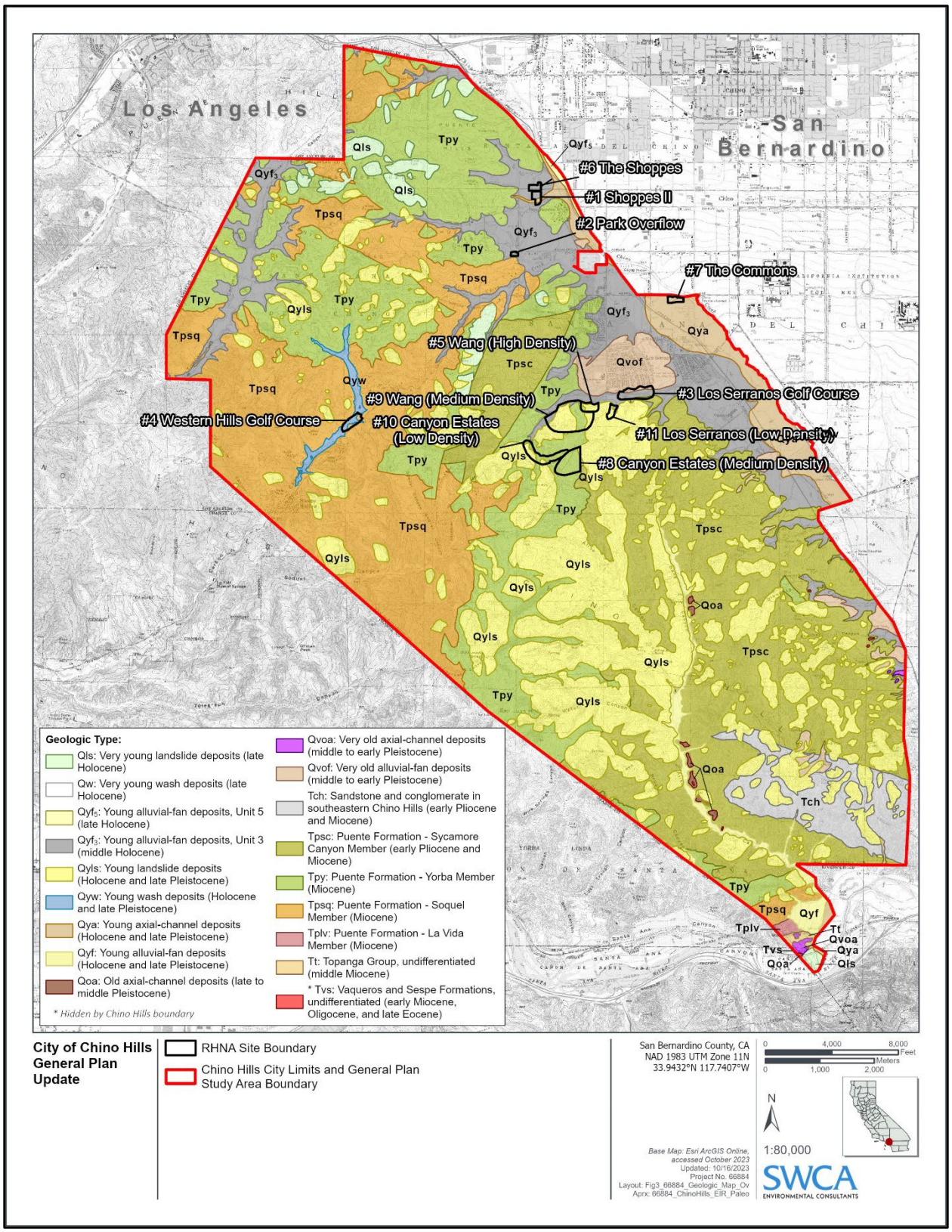


Figure 3. Geologic map of the Chino Hills city limits and General Plan study area and RHNA site locations.

Fossil sites from the Vaqueros and Sespe Formations have yielded numerous specimens allowing geologists and paleontologists to correlate different regional exposures across Southern California. For example, the correlation of rocks attributed to the Vaqueros Formation across Southern California is based upon the *Turritella inezana* fossil fauna. The Vaqueros Formation has yielded marine taxa, including whales, pinnipeds, sharks, foraminifers, bryozoans, bivalves, gastropods, echinoids, barnacles, and polychaetes (Calvano et al. 2008; Cushman and Leroy 1938; Dickinson and Lowe 1966; Loel and Corey 1932; Wiedey 1928), and terrestrial taxa, including metatherian mammals, canids, rhinoceroses, horses, camels, musk deer, oreodonts, pikas, rabbits, rodents, and hedgehogs (Whistler and Lander 2003), among others. The Sespe Formation has yielded numerous nonmarine to terrestrial vertebrate fossils, such as early primates, amphicyonids ("beardogs"), canids, bears, mustelids, rhinoceroses, titanotheres, artiodactyls, camelids, oreodonts, peccaries, pikas, rodents, birds, turtles, iguana, lizards, snakes, frogs, mollusks, and others throughout its mappable extent in Southern California, with such taxa ranging in age from the Eocene to early Miocene (Bailey and Jahns 1954; Golz and Lillegraven 1977; Hunt and Stepleton 2015; Kelly and Whistler 1994; Prothero and Vance 1996; Wang et al. 2009; Whistler and Lander 2003; Woodburne 1987).

7.2.5 *Geology of the RHNA Sites*

For this paleontological resources assessment, SWCA reviewed the geologic mapping of Morton and Miller (2006) at each RHNA site. Because Section 7.2 provides a detailed description of each geologic unit within the city limits and describes the paleontological setting of each unit, only a summary of the local geology at each RHNA site is provided here. Figures within Appendix C present the local geology (within a 0.5-mile buffer) around each RHNA site. This geologic review is summarized below.

Site 1 – The Shoppes II: This site is mapped at the surface as middle Holocene young alluvial-fan deposits, Unit 3 (Qyf_3) and Holocene and late Pleistocene young axial-channel deposits (Qya). However, several surface exposures of the Miocene Puente Formation, Yorba Member (Tpy) are present within 0.5 mile of this location. The Puente Formation, Yorba Member is likely present at very shallow depth based on its surface exposures in proximity to the site.

Site 2 – Community Park Overflow: This site is mapped at the surface as middle Holocene young alluvial-fan deposits, Unit 3 (Qyf_3). However, surface exposures of the Miocene Puente Formation, Yorba Member (Tpy) and the Puente Formation, Soquel Member (Tpsq) are immediately adjacent to the site to the west and south, respectively, and are extensively exposed at the surface along the neighboring slopes to the southwest. Although not present at the surface of the site, the Yorba Member and Soquel Member of the Puente Formation are likely present at very shallow depth based on their surface exposures in proximity to the site.

Site 3 – Los Serranos Golf Course: This site is mapped at the surface as middle Holocene young alluvial-fan deposits, Unit 3 (Qyf_3), middle to early Pleistocene very old alluvial-fan deposits (Qvof), and early Pliocene and Miocene Puente Formation, Sycamore Canyon Member (Tpsc). Additionally, Holocene and late Pleistocene young landslide deposits (Qyls) are mapped at the surface immediately adjacent to the southern boundary of the site and overlie both the Sycamore Canyon (Tpsc) and Yorba (Tpy) members of the Puente Formation within a 0.5-mile radius of the site. Although close to the southern site boundary, young landslide deposits are unlikely to be present within the site since construction of the golf course likely removed any landslide debris or rubble that could have been present. Subsurface deposits of the Sycamore Canyon and Yorba Members are likely present at shallow depth, however, underlying the alluvial-fan deposits mapped at the surface.

Site 4 – Western Hills Golf Course: This site is mapped at the surface as Holocene and late Pleistocene young wash deposits (Qyw) and Miocene Puente Formation, Soquel Member (Tpsq). Holocene and late Pleistocene young landslide deposits (Qyls) are also located near the site on the northwestern slopes; however, based on the topography of the site, they are unlikely to be present within the site as unmapped deposits. Additionally, Miocene Puente Formation, Yorba Member (Tpy) is present approximately 0.5 mile to the southeast near the top of the hills; this deposit is unlikely to be in the site based on the stratigraphy of the members of the Puente Formation and the local topography.

Site 5 – Wang (High Density): The site is mapped at the surface as middle Holocene young alluvial-fan deposits, Unit 3 (Qyf_3), Holocene and late Pleistocene young landslide deposits (Qyls), and Miocene Puente Formation, Yorba Member (Tpy). Within portions of the site mapped as young alluvial-fan deposits and young landslide deposits, the Puente Formation, Yorba Member is likely present at very shallow depth. Additionally, middle to early Pleistocene very old alluvial-fan deposits (Qvof) is situated near the site along the north side of Country Club Drive and the east side of Rolling Ridge Drive; very old alluvial-fan deposits may be present as a thin unit in the subsurface of the site, underlying young alluvial-fan deposits and young landslide deposits and overlying the Puente Formation, Yorba Member.

Site 6 – The Shoppes: The site is mapped at the surface as middle Holocene young alluvial-fan deposits, Unit 3 (Qyf_3), with alluvial fans radiating away from the Puente-Chino Hills located north, west, and south of the site. Immediately adjacent to and surrounding the site are exposures of the Holocene and late Pleistocene young axial-channel deposits (Qya) associated with Chino Creek, and on the northwest side of Chino Creek, exposures of late Holocene young alluvial-fan deposits, Unit 5 (Qyf_5) are mapped at the surface across the basin. Based on their proximity to the site and the flattened topography, young alluvial-fan deposits, Unit 5 and young axial-channel deposits may be present, but unmapped, at the surface within the site. Underlying these alluvial deposits, the Miocene Puente Formation, Yorba Member (Tpy) may be present at shallow depth based on the proximity of exposures adjacent to the site.

Site 7 – The Commons: The site is mapped at the surface as Holocene and late Pleistocene young axial-channel deposits (Qya). Based on their proximity to the site, middle Holocene young alluvial-fan deposits, Unit 3 (Qyf_3) and late Holocene young alluvial-fan deposits, Unit 5 (Qyf_5), which are present on the north and south banks of Chino Creek, may be present but unmapped at the surface of the site. Additionally, surficial young axial-channel deposits associated with Chino Creek may be underlain by middle to early Pleistocene very old alluvial-fan deposits (Qvof) at shallow depth within the site.

Site 8 – Canyon Estates (Medium Density): The site is mapped at the surface as Miocene Puente Formation, Yorba Member (Tpy). This site is also bordered by surface exposures of Holocene and late Pleistocene young landslide deposits (Qyls), which may be present at the surface along the fringes of the site. The Miocene Puente Formation, Soquel Member (Tpsq) may also be present but unmapped at the surface or present within the subsurface at the site based on the proximity of its exposures, stratigraphic relations, and the local topography of the site. Note that the early Pliocene and Miocene Puente Formation, Sycamore Canyon Member (Tpsc) is mapped at the surface immediately adjacent to and upslope of the site; however, based on the stratigraphy of the Puente Formation and the local topography, the Sycamore Canyon Member is unlikely to be present within the site.

Site 9 – Wang (Medium Density): The site is mapped at the surface as middle Holocene young alluvial-fan deposits, Unit 3 (Qyf_3), Holocene and late Pleistocene young landslide deposits (Qyls), and Miocene Puente Formation, Yorba Member (Tpy). Most of the surface of the site is covered by young alluvial-fan deposits, Unit 3 and young landslide deposits; however, the exposures of the Puente Formation, Yorba Member that are mapped at the surface within the eastern portion of the site likely extend at shallow depth to the west, underlying the young alluvial-fan deposits, Unit 3 and young landslide deposits. The early Pliocene and Miocene Puente Formation, Sycamore Canyon Member (Tpsc) is also mapped at the surface within 0.5 mile of the site but is unlikely to be present within the site based on stratigraphy of the Puente Formation and the local topography.

Site 10 – Canyon Estates (Low Density): The site is mapped at the surface as Holocene and late Pleistocene young landslide deposits (Qyls) and Miocene Puente Formation, Yorba Member (Tpy). Although not mapped at the surface within the bounds of the site, middle Holocene young alluvial-fan deposits, Unit 3 (Qyf_3) are mapped at the surface immediately adjacent to the site on its north boundary and could extend into the site as unmapped deposits.

Site 11 – Los Serranos (Low Density): The site is mapped at the surface as middle Holocene young alluvial-fan deposits, Unit 3 (Qyf_3) and Holocene and late Pleistocene young landslide deposits (Qyls). Additionally, the early Pliocene and Miocene Puente Formation, Sycamore Canyon Member (Tpsc) or the Miocene Puente Formation, Yorba Member (Tpy) are mapped near the site and could be present in the shallow subsurface underlying the sediments of middle Holocene young alluvial-fan deposits, Unit 3 (Qyf_3) and/or Holocene and late Pleistocene young landslide deposits (Qyls).

7.3 Museum Records Search

SWCA requested updated museum records search results from the SBCM (Confidential Appendix A) and NHMLA (Confidential Appendix B). Based on the results of the museum records search, the SBCM and NHMLA contain numerous records of paleontological resources from within the city and its vicinity; however, no fossil localities were identified from within the bounds of the eleven RHNA sites. The results of the museum records searches are summarized in Table 1.

Table 1. SBCM and NHMLA Fossil Localities within or near the City of Chino Hills

Locality Number	General Location	Formation	Taxa	Depth
SBCM 1.116.319	Within the city limits, approximately 0.21 mile away from Site 1 The Shoppes II and Site 6 The Shoppes	Unnamed Pleistocene deposits	Indeterminant vertebrate, rabbits, rodents, lizards, snakes, gastropods	Unknown
SBCM 1.116.318	Within the city limits, approximately 0.25 miles away from Site 1 The Shoppes II and Site 6 The Shoppes	Unnamed Pleistocene deposits	Indeterminant vertebrate, indeterminant mammal, rodents, gastropods	Unknown
SBCM 1.116.304–1.116.317 and 1.116.320–1.116.330	Within the city limits, approximately 0.35 to 0.65 mile away from Site 6 The Shoppes	Puente Formation, Yorba Member	Whales, seals, bony fish, sharks, sea stars, indeterminant mollusks, bivalves, gastropods, plants, algae	Unknown
SBCM 1.116.265–1.116.268	Within the city limits, approximately 0.35 to 0.60 mile away from Site 6 The Shoppes	Puente Formation, Soquel Member or Yorba Member	Bony fish, sharks, echinoderms, indeterminant	Unknown

Locality Number	General Location	Formation	Taxa	Depth
	and 0.60 to 0.90 mile away from Site 2 Community Park Overflow		mollusks, plants, trace fossils	
SBCM 1.116.262–1.116.264	Within the city limits, approximately 0.80 mile away from Site 6 The Shoppes	Puente Formation, Yorba Member	Indeterminant vertebrates, plants	Unknown
SBCM 1.116.301–1.116.303	Within the city limits, approximately 1.0 mile away from Site 6 The Shoppes	Unnamed Pleistocene deposits	Indeterminant mammals, rodents	Unknown
		Puente Formation, Yorba Member	Seals, rodents, bony fish, shark, plants, brown algae	
SBCM 1.116.80, 1.116.85–1.116.109, 1.116.122–1.116.179, 1.116.215–1.116.233, 1.116.235–1.116.240, 1.116.246–1.116.253, 1.116.255–1.116.261 (128 fossil localities)	Within the city limits, extending from 0.25 to 2.0 miles away from Site 2 Community Park Overflow	Unnamed Pleistocene deposits	Indeterminant vertebrates, bison, horses, trace fossils	Unknown
		Puente Formation, Yorba Member	Indeterminant mammals, whales, bony fish, sharks, crustaceans, indeterminant mollusks, bivalves, gastropods, sponges, plants, trace fossils	
		Puente Formation, Soquel Member	Whales, bony fish, sponges, plants	
SBCM 1.116.290	Within the city limits, approximately 0.15 mile away from Site 7 The Commons	Unnamed Pleistocene deposits	Indeterminant vertebrates, indeterminant mammals, rodents, gastropods	Unknown
SBCM 1.116.338–1.116.350	Within the city limits, approximately 1.0 mile away from Site 7 The Commons	Unnamed Pleistocene deposits overlying Puente Formation (member unspecified)	Indeterminant vertebrates, indeterminant mammals, bison, rabbits, rodents, moles, bird, snake, lizard, frog, sharks, bivalves, gastropods	Unknown
SBCM 1.116.246	Within the city limits, approximately 0.65 mile away from Site 4 Western Hills Golf Course	Puente Formation, Soquel Member	Bony fish, petrified wood	Unknown
SBCM 1.116.111 (see SBCM 1.116.112–1.116.117 below, which were part of the same project)	Within the city limits, approximately 0.05 mile away from Site 5 Wang (High Density) and 0.20 mile away from Site 3 Los Serranos Golf Course	Puente Formation, Yorba Member	Unknown – fossil specimens unlisted in archive and fossils could not be located	Unknown
SBCM 1.116.24	Within the city limits, approximately 0.70 mile away from Site 5 Wang (High Density)	Puente Formation, Sycamore Canyon Member	More than 3,500 specimens, including bony fish, crustaceans, bivalves, foraminifers, plants, algae	Various (from shale beds)
SBCM 1.116.112–1.116.117	Within the city limits, approximately 0.60 to 0.70 mile away from Site 3 Los Serranos Golf Course	Puente Formation, Yorba Member Puente Formation, Sycamore Canyon Member	Toothed whales, dolphins, baleen whales, bony fish, indeterminant mollusks, bivalves, gastropods, foraminifers, plants	
SBCM 1.116.269	Within the southeastern portion of the city (east slope of the Puente-Chino Hills)	Puente Formation, Yorba Member	Whales	Unknown
SBCM 1.116.270	Within the southeastern portion of the city (east slope of the Puente-Chino Hills in Chino Hills State Park)	Puente Formation, Yorba Member	Whales	Unknown
SBCM 1.116.11, 1.116.12–1.116.114	Within the southeastern portion of the city (immediately east of Chino Hills State Park)	Puente Formation, Sycamore Canyon Member	Bony fish, bivalves, plants	Unknown

Locality Number	General Location	Formation	Taxa	Depth
SBCM 1.116.241–1.116.244	Within the southeastern portion of the city (immediately east of Chino Hills State Park)	Puente Formation, Sycamore Canyon Member	Bony fish, bivalves, plants	Unknown
SBCM 1.116.271–1.116.274	Within the southeastern portion of the city (immediately east of Chino Hills State Park near Owl Rock Quarry)	Puente Formation, Sycamore Canyon Member	Bony fish, bivalves, plants	Unknown
SBCM 1.116.16–1.116.23, 1.116.180–1.116.206 (35 fossil localities)	Within the southeastern portion of the city (within Owl Rock Quarry)	Puente Formation, Sycamore Canyon Member	Indeterminant chordates, sharks, bivalves, plants	Unknown
SBCM 5.5.48–5.5.58, 1.116.275–1.116.288	5.0 miles northeast of and outside of the city limits	Unnamed Pleistocene deposits	Mastodons, mammoths, saber-toothed cats, camels, bison, horses, ground sloths, rabbits, rodents, shrews	Unknown
LACM VP 1728	Within the city limits, approximately 0.25 mile away from Site 1 The Shoppes II	Unnamed Pleistocene deposits	Horses, camels	15–20 feet bgs
LACM VP 7508	Within the city limits	Unnamed Pleistocene deposits	Ground sloths, elephants, horses	Unknown
LACM VP 7268, 7271	Within the city limits, approximately 0.5 mile away from Site 3 Los Serranos Golf Course	Unnamed Pleistocene deposits	Horses	Unknown
LACM IP 17597-17600	1.7 miles west of and outside of the city limits	Puente Formation	Undifferentiated invertebrates, shelled cephalopods	Unknown
LACM VP 6166, 6167, 6172, 6173, 7471	4.7 miles northwest of and outside of the city limits	Puente Formation	Bony fish and sharks	Surface
LACM IP 17925–17928, 17932	7.1 miles northwest of and outside of the city limits	Puente Formation, Sycamore Canyon Member	Bivalves, gastropods, plants	6–6.5 feet bgs

Sources: SBCM (2022) and NHMLA (2022)

Note: bgs = below ground surface

7.4 Reconnaissance Survey of the RHNA Sites

To supplement the project-level analysis of the RHNA sites, SWCA's Staff Paleontologist Kristina Akesson, B.S., conducted a pedestrian- and windshield-level field reconnaissance survey of seven of the eleven RHNA sites. As discussed previously, four of the eleven RHNA sites were not surveyed and were only subject to a desktop-level review. The results of the field reconnaissance survey are summarized below.

Site 1 – The Shoppes II: This site was subject to a pedestrian survey. The site is partially disturbed at the surface, based on the presence of an asphalt-covered parking lot in the northeastern portion and imported gravel in the western portion; however, the southern portion is mostly undisturbed, covered in soil and grasses, and contains small hills across a west-facing slope (Figure 4). Geologic mapping by Morton and Miller (2006), which indicates the RHNA site is mapped at the surface as middle Holocene young alluvial-fan deposits, Unit 3 (Qyf_3) and Holocene and late Pleistocene young axial-channel deposits (Qya), could not be confirmed due to ground cover. Soil observed at the surface consisted of light brown to tan, very fine- to coarse-

grained sand, which was poorly sorted and angular to subangular, and silt. No paleontological resources were observed.

Site 2 – Community Park Overflow: This site was subject to a pedestrian survey. The surface of the site has been disturbed by vehicles (i.e., parking and traffic) and the construction of underground utilities based on the presence of a manhole cover within the site; otherwise, it is an empty, flat lot capped with a veneer of gravel that may have originated as previously disturbed sediments from the site (Figure 5). These reworked sediments may have been from the middle Holocene young alluvial-fan deposits, Unit 3 (Qyf_3), which are composed of eroded and transported clasts of the Miocene Puente Formation, Yorba and Soquel Members (Tpy and Tpsq), which are also mapped within the site. These reworked sediments consist of tan, poorly sorted silt and angular to subangular, very fine- to coarse-grained sand, gravel, conglomerate.
No paleontological resources were observed.

Site 3 – Los Serranos Golf Course: This site was subject to a pedestrian survey. Areas mapped as the Puente Formation, Sycamore Canyon Member (Tpsc) are covered by vegetation, areas mapped as young alluvial-fan deposits, Unit 3 (Qyf_3) have limited exposures along a channel wash crossing the site, and areas mapped as very old alluvial-fan deposits (Qvof) have limited exposures along the same channel (Figure 6). Very young alluvial-fan deposits, Unit 3 consist of light medium brown silt and very fine-grained sand with gravel, poorly sorted and subangular to subrounded in shape. Very old alluvial-fan deposits consist of light brown to tan, fine- to medium-grained sand and gravel, which are poorly sorted and angular to subangular in shape. During the survey, SWCA's paleontologist recorded one nonsignificant fossil locality (F20220623-66884-KA01) along the channel's bank in an area mapped as very old alluvial-fan deposits; this fossil locality yielded poorly preserved fossil fish scales observed in clasts eroded from older geologic units (presumably the Puente Formation) that washed into the channel (Figure 7). Fossils from this locality were not collected, and no further mitigation or treatment is required. Although determined to be nonsignificant in the field and ultimately not collected, the presence of fossil material indicates the fossil preservation potential of the Puente Formation and the overlying alluvial or surface deposits.

Site 4 – Western Hills Golf Course: This site was subject to a pedestrian survey. Geologic mapping by Morton and Miller (2006) was mostly obscured by vegetation, soil, and disturbed sediments across most of the site (Figure 8). Limited exposures of the Puente Formation, Soquel Member (Tpsq) are present along the stream channel where erosion has removed surficial alluvial sediments and exposed sandstones within the stream channel, suggesting that the Puente Formation, Soquel Member is likely present at shallow depth beneath surficial sediments. Topographically, the site contains small, rolling hills and a stream channel at the base of a valley, which is partially or fully disturbed, based on the presence of pipes along the banks and crossing the stream channels. No paleontological resources were observed.

Site 5 – Wang (High Density): The site was subject to a windshield survey (visually viewed from outside the site boundary) because the site is completely vegetated with grasses for a cattle pasture and was inaccessible at the date of the paleontological field reconnaissance survey (Figure 9). Geologic mapping by Morton and Miller (2006) could not be confirmed due to vegetative ground cover. Topography at the site consisted of rolling hills with no discernable creeks or channels. No paleontological resources were observed.

Site 6 – The Shoppes: The site was subject to a windshield (drive-by) survey because the site is completely disturbed with a parking lot and commercial buildings (Figure 10). Geologic mapping by Morton and Miller (2006) could not be confirmed due to prior site development. Topography

at the site was flat, with no swales or channels. Based on the presence of buildings and underground utilities (re: manholes within the parking lot), the site has likely been disturbed to moderate depths. No paleontological resources were observed.

Site 7 – The Commons: The site was subject to a windshield (drive-by) survey because the site is completely disturbed with a parking lot and commercial buildings (Figure 11). Geologic mapping by Morton and Miller (2006) could not be confirmed due to prior site development. Topography at the site was flat, with no swales or channels. Based on the presence of buildings and underground utilities (re: manholes within the parking lot), the site has likely been disturbed to moderate depths. No paleontological resources were observed.

Site 8 – Canyon Estates (Medium Density): At the request of the City, a paleontological field reconnaissance survey was not conducted for this site.

Site 9 – Wang (Medium Density): At the request of the City, a paleontological field reconnaissance survey was not conducted for this site.

Site 10 – Canyon Estates (Low Density): At the request of the City, a paleontological field reconnaissance survey was not conducted for this site.

Site 11 – Los Serranos (Low Density): At the request of the City, a paleontological field reconnaissance survey was not conducted for this site.



Figure 4. Overview of RHNA Site 1 The Shoppes II, showing land topography, disturbed surface, and ground cover; facing north. Geologic mapping could not be confirmed due to ground cover.



Figure 5. Overview of RHNA Site 2 Community Park Overflow, showing land topography and disturbed surface of reworked sediments, possibly from middle Holocene young alluvial-fan deposits, Unit 3 or Miocene Puente Formation, Yorba and Soquel Members; facing west.



Figure 6. Overview of RHNA Site 3 Los Serranos Golf Course, showing land topography within the golf course; facing east. Area mapped as middle to early Pleistocene very old alluvial-fan deposits within the channel crossing the site yielded nonsignificant fossil fish scales (F20220623-66884-KA01), preserved within an eroded clast originating from the Miocene Puente Formation.



Figure 7. Fossil locality (F20220623-66884-KA01) from middle to early Pleistocene very old alluvial-fan deposits recovered from RHNA Site 3 Los Serranos Golf Course. Fossil material consists of poorly preserved fish scales, which are nonsignificant and therefore not collected.



Figure 8. Overview of RHNA Site 4 Western Hills Golf Course, showing land topography within the golf course and level of disturbance of vegetation surficial sediments; facing north. Geologic mapping was partially confirmed by limited exposures of the Puente Formation, Soquel Member (Tpsq) present along the stream channel.



Figure 9. Overview of RHNA Site 5 Wang (High Density), showing land topography and vegetated cattle pasture; facing south. Geologic mapping could not be confirmed due to ground cover.



Figure 10. Overview of RHNA Site 6 The Shoppes, showing previous site development with a parking lot, commercial buildings, and underground utilities; facing north. Geologic mapping could not be confirmed due to ground cover.



Figure 11. Overview of RHNA Site 7 The Commons, showing previous site development with a parking lot, commercial buildings, and underground utilities; facing east. Geologic mapping could not be confirmed due to ground cover.

7.5 Paleontological Potential of the Study Area

Based on the results of this updated paleontological resources assessment, which included a broad (i.e., program-level) review of the city limits (Figure 12), as well as a focused (i.e., project-level) review of the eleven RHNA sites within the city limits, SWCA determined the paleontological potential of the geologic units within the study area (Appendix D). Based on these data, the geologic units within the study area were binned in three paleontological sensitivity classes, based off the SVP (2010) paleontological potential classification system described in Section 6.3 above: low, low to high (increasing with depth), and high.

Geologic units within the study area with low paleontological sensitivity include: late Holocene very young landslide deposits (Qls), late Holocene very young wash deposits (Qw), late Holocene young alluvial-fan deposits, Unit 5 (Qyf_5), and Holocene and late Pleistocene young landslide deposits (Qyls). These geologic units are regarded as too young (i.e., less than 5,000 years old) to yield significant paleontological resources. Additionally, landslide deposits form as a result of high-energy debris flows, which are nonconducive to fossil preservation (i.e., the forces associated with landslides typically result in destruction of mineralized hard parts that would otherwise be preserved in lower-energy depositional environments). Therefore, these units have a low paleontological sensitivity but may be underlain at variable depth by older geologic units capable of yielding significant fossils.

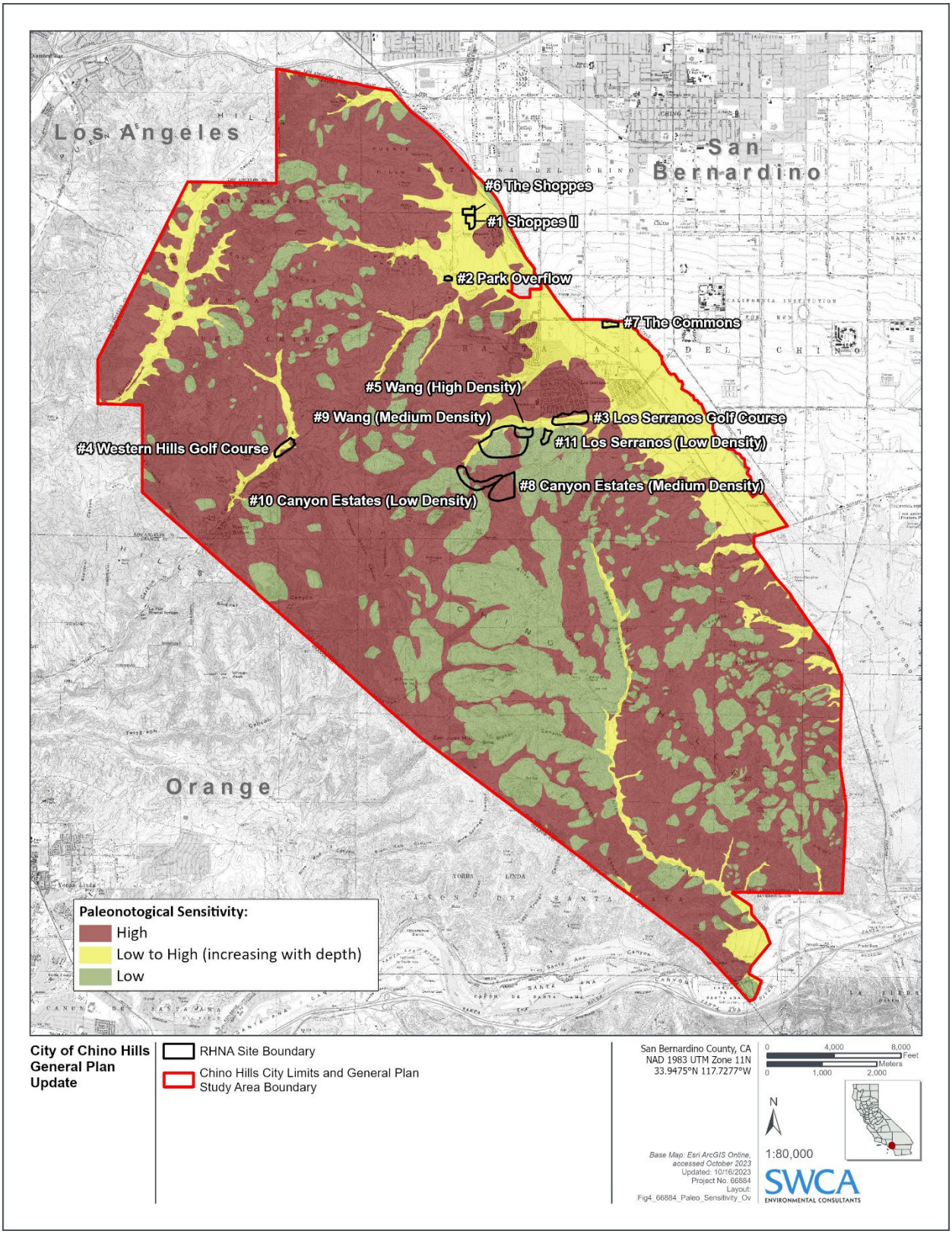


Figure 12. Paleontological sensitivity of the Chino Hills city limits and General Plan study area and RHNA site locations.

Geologic units within the study area with low to high (increasing with depth) paleontological sensitivity include: middle Holocene young alluvial-fan deposits, Unit 3 (Qyf_3); Holocene and late Pleistocene young wash deposits (Qyw); Holocene and late Pleistocene young axial-channel deposits (Qya); and Holocene and late Pleistocene young alluvial-fan deposits (Qyf, undivided and may contain Qyf_5 and Qyf_3). The uppermost sediments within these geologic units are likely too young to contain significant fossils but may transition with depth to older sediments capable of preserving fossils. The depth to this transition within these geologic units is unknown and variable, but likely shallow (e.g., 10 feet below ground surface [bgs], based on depths of known fossil localities from Pleistocene deposits within the city limits [NHMLA 2022]). Therefore, these geologic units have a low to high (increasing with depth) paleontological sensitivity.

Geologic units within the study area with high paleontological sensitivity include: late to middle Pleistocene old axial-channel deposits (Qoa); middle to early Pleistocene very old axial-channel deposits (Qvoa); middle to early Pleistocene very old alluvial-fan deposits (Qvof); early Pliocene and Miocene sandstone and conglomerate in southeast Chino Hills (Tch); early Pliocene and Miocene Puente Formation – Sycamore Canyon Member (Tpsc); Miocene Puente Formation – Yorba Member (Tpy); Miocene Puente Formation – Soquel Member (Tpsq); Miocene Puente Formation – La Vida Member (Tplv); middle Miocene Topanga Group, undifferentiated (Tt); and early Miocene, Oligocene, and late Eocene Vaqueros and Sespe formations (Tvs). These geologic units have yielded a plethora of significant paleontological resources throughout their mappable extent in Southern California, particularly in Puente-Chino Hills regions where these older geologic units have been uplifted and exposed at the surface. Furthermore, exposure of unweathered material during construction has a high possibility of yielding fossils not preserved or noticeable at the surface. Therefore, they have a high paleontological sensitivity.

The paleontological sensitivities of the eleven RHNA sites are based on the assessment described above. Figures within Appendix D present the local paleontological sensitivity (within a 0.5-mile buffer) around each RHNA site. Based on the geologic units mapped at the surface, the RHNA sites have the following paleontological sensitivity classifications:

Site 1 The Shoppes II: This site has a low to high (increasing with depth) paleontological sensitivity.

Site 2 Community Park Overflow: This site has a low to high (increasing with depth) paleontological sensitivity.

Site 3 Los Serranos Golf Course: This site has low to high (increasing with depth) and high paleontological sensitivity.

Site 4 Western Hills Golf Course: This site has low to high (increasing with depth) and high paleontological sensitivity.

Site 5 Wang (High Density): This site has low, low to high (increasing with depth), and high paleontological sensitivity.

Site 6 The Shoppes: This site has a low to high (increasing with depth) paleontological sensitivity.

Site 7 The Commons: This site has a low to high (increasing with depth) paleontological sensitivity.

Site 8 Canyon Estates (Medium Density): This site has a high paleontological sensitivity.

Site 9 Wang (Medium Density): This site has low, low to high (increasing with depth), and high paleontological sensitivity.

Site 10 Canyon Estates (Low Density): This site has low and high paleontological sensitivity. Note that a geologic unit (middle Holocene young alluvial-fan deposits, Unit 3 [Qyf_3]), which has low to high (increasing with depth) paleontological sensitivity, is present immediately outside of the site along its northern boundary; if present as unmapped deposits, then the site also has low to high (increasing with depth) paleontological sensitivity.

Site 11 Los Serranos (Low Density): This site has low and low to high (increasing with depth) paleontological sensitivity.

8 IMPACT ASSESSMENT

This updated paleontological resources assessment was conducted to analyze any potential impacts this project may have on paleontological resources located broadly within the city limits and locally within the eleven RHNA sites. Based on the results of this study, the project may result in impacts to geologic units with low to high (increasing with depth), and/or high paleontological sensitivities. Broadly, ground-disturbing activities impacting geologic units of low paleontological sensitivity are unlikely to result in impacts to significant fossils; however, these geologic units are directly underlain by older geologic units with relatively higher paleontological sensitivity at variable depths across the city. Ground-disturbing activities that have the potential to impact geologic unit with low to high (increasing with depth) or high paleontological sensitivities, whether present at the surface or at depth, may result in impacts to significant fossils if such disturbances would impact previously undisturbed sediments. Locally, the paleontological sensitivities of the eleven RHNA sites vary among low, low to high (increasing with depth), and high paleontological sensitivities, depending on the geologic units mapped at the surface, the geologic units that may be present in the subsurface, and the level of previous ground disturbance at each site that may have resulted in the presence of unmapped disturbed sediments or artificial fill from the surface to unknown depths. Geotechnical investigations and grading/engineering plans would inform a refinement of this impact assessment and allow a qualified paleontologist to develop mitigation requirements specific and appropriate to each RHNA site.

Cogstone's (2011) paleontological resources assessment does not provide specific recommendations for the mitigation of paleontological resources. However, the City's EIR for the 2015 General Plan Update (City of Chino Hills 2015b) requires that site-specific paleontological resources investigations be conducted for discretionary land development projects to determine the potential for impacts to significant paleontological resources; if the potential to encounter paleontological resources is identified, then paleontological monitoring or grading in targeted areas by a qualified professional paleontologist would be required. Potentially significant fossil material should also be preserved, restored, catalogued, and/or transmitted to an appropriate repository. Implementation of these procedures would result in less-than-significant impacts, pursuant to CEQA.

In relation to the current project, which proposes updates to the Chino Hills 2015 General Plan study area and proposes inclusion of eleven RHNA sites, ground-disturbing activities could impact previously undisturbed geologic units with the potential to yield significant paleontological resources, either at the surface or at depth. Should fossils be encountered during discretionary land development projects within the Chino Hills 2015 General Plan study area, they would be at risk of damage or destruction, constituting a significant impact under CEQA. However, implementation of the City's existing General Plan Policy CN-2.2 and Actions CN-2.2.1 through CN-2.2.3 would reduce any potential impacts to less-than-significant levels. In accordance with the City's policy and actions, SWCA reviewed the eleven RHNA sites and concluded that impacts to paleontological resources may occur, and mitigation recommendations should be developed and implemented for the RHNA sites to reduce potential impacts to less-than-significant levels, pursuant to CEQA.

9 RECOMMENDED IMPACT AVOIDANCE AND MITIGATION MEASURES

This section provides general measures geared to avoid, reduce, or mitigate potential impacts resulting from build out under the City's General Plan.

9.1 Measures Applying to Development Projects in General Plan Study Area

Based on the results of the program-level assessment, the paleontological potential of the geologic units mapped at the surface or present at depth are low, low to high (increasing with depth), and high paleontological sensitivities. Implementation of the City's existing General Plan Policy CN-2.2 and Actions CN-2.2.1 through CN-2.2.3 would reduce any potential impacts to less-than-significant levels, pursuant to CEQA. Therefore, the requirements established in the 2015 Chino Hills General Plan would still be applicable to the current General Plan Update SEIR.

The existing General Plan (City of Chino Hills 2015a) policy and actions are listed below for reference.

- **Policy CN-2.2:** Protect Chino Hills' paleontological resources.
  - **Action CN-2.2.1:** Require appropriate paleontological surveys as part of the environmental review process where paleontological resources may be present.
  - **Action CN-2.2.2:** Where paleontological resources are found during development activities, require on-site inspections by a qualified paleontologist during grading activities where paleontological resources may be present.
  - **Action CN-2.2.3:** Require identified paleontological materials to be preserved, restored, cataloged, and/or transmitted to the appropriate repository or as otherwise directed by a qualified professional paleontologist.

9.2 Mitigation Measures for RHNA Sites

The results of the project-level assessment of the RHNA sites indicate that the geologic mapping is similar among the eleven RHNA sites. Thus, the surficial geologic units of the eleven RHNA sites have similar paleontological sensitivities, ranging among low, low to high (increasing with depth), and/or high paleontological sensitivities. Moreover, surficial geologic units noted as having low paleontological sensitivity are immediately underlain at variable depths by older geologic units that have relatively higher paleontological sensitivity (i.e., either low to high [increasing with depth] and/or high paleontological sensitivity), resulting in each RHNA site having high paleontological sensitivity at some depth. Depending on the extent and depth of ground-disturbing activities for a development project(s) within each of the RHNA sites, geologic units of high paleontological sensitivity could be encountered, and significant fossils (if present) within those geologic units would be at risk for damage or destruction. Therefore, impacts to paleontological resources may occur. Accordingly, the following avoidance or minimization recommendations applicable to all eleven RHNA sites.

Mitigation Measure RHNA-PR-1. Requirements to Avoid Impacts to Paleontological Resources. The following measures apply to all eleven RHNA sites. These recommendations have been developed in accordance with and incorporate the performance standards of the SVP (1995, 2010), state and local regulations, and best practices in mitigation paleontology (Murphey et al. 2019).

a. **Retain a Qualified Professional Paleontologist:** Prior to the issuance of any permits allowing ground-disturbing activities, a qualified paleontologist meeting the SVP (2010) standards (Qualified Paleontologist) should be retained by the project proponent. The Qualified Paleontologist should provide technical and compliance oversight of all work as it relates to paleontological resources, should be responsible for ensuring the employee training provisions are implemented during implementation of the project, and should report to the project site in the event potential paleontological resources are encountered.

b. **Prepare a Paleontological Resources Management Plan:** A Paleontological Resources Management Plan (PRMP) should be prepared by the Qualified Paleontologist that incorporates all available geologic data for the project to determine the necessary level of effort for monitoring based on the planned rate of excavation and grading activities, the geologic sediments/materials being excavated, and the depth of excavation. The PRMP would establish the ground rules for the entire paleontological resource mitigation program. The Qualified Paleontologist should implement the PRMP as the project paleontologist, program supervisor, and principal investigator. The PRMP should incorporate the results of all additional paleontological resources assessment(s), geotechnical investigation, and the final engineering/grading plans for the project, including pertinent geological and paleontological literature, geologic maps, and known fossil locality information. The PRMP should include processes and procedures for paleontological monitoring, fossil salvaging (if needed), reporting, and curation (if needed). The PRMP should also require the Qualified Paleontologist to prepare a report of the findings of the monitoring efforts after construction is completed. The PRMP should also require the Qualified Paleontologist to obtain a curatorial arrangement with a qualified repository prior to construction if significant paleontological resources are discovered and require curation.

c. **Conduct Worker Training:** The Qualified Paleontologist should develop a Worker Environmental Awareness Program to train the project personnel on the legal requirements for preserving fossil resources, as well as the procedures to follow in the event of a fossil discovery. This training should be given to on-site workers before ground-disturbing work commences.

d. **Monitor for Paleontological Resources:** Areas where the mapped geologic units have low paleontological sensitivity should be initially spot checked when ground disturbances impact sediments greater than or equal to 10 feet bgs to check for the presence of the underlying older geologic units of relatively higher paleontological sensitivity. If geologic units of relatively higher paleontological sensitivity would not be observed during initial spot-checking, then the level of spot-checking should be reduced or ceased at the discretion of the Qualified Paleontologist. Areas where the mapped geologic units have low to high (increasing with depth) paleontological sensitivity should be monitored full time when ground disturbances impact sediments greater than or equal to 10 feet bgs; ground disturbances in these areas that are less than 10 feet bgs should be spot checked. Areas where the mapped geologic units have high paleontological sensitivity should be monitored full time, regardless of depth. Paleontological monitoring would not be required when ground-disturbing activities impact only geologic units of low paleontological sensitivity at depths less than 10 feet bgs. Additionally, monitoring would not be required in previously disturbed sediments or artificial fill, regardless of depth. Monitoring should be conducted by a paleontological monitor who meets the standards of the SVP (2010). Monitoring should be conducted in accordance with the protocols outlined in the PRMP and under the supervision of the Qualified Paleontologist. The Qualified Paleontologist may periodically inspect construction activities to adjust the level of monitoring in response to subsurface conditions. Monitoring efforts can be increased, reduced, or ceased entirely if determined adequate by the Qualified Paleontologist. Paleontological monitoring should include inspection of exposed sedimentary units during active excavations within sensitive geologic

sediments. The Qualified Paleontologist should have authority to temporarily divert activity away from exposed fossils to evaluate the significance of the find and, should the fossils be determined significant, professionally and efficiently recover the fossil specimens and collect associated data. Paleontological monitors should record pertinent geologic data and collect appropriate sediment samples from any fossil localities. Recovered fossils should be prepared to the point of curation, identified by qualified experts, listed in a database to facilitate analysis, and deposited in a designated paleontological repository

e. **Prepare a Paleontological Resources Monitoring Report:** Upon conclusion of ground-disturbing activities, the Qualified Paleontologist overseeing paleontological monitoring should prepare a final Paleontological Resources Monitoring Report that documents the paleontological monitoring efforts for the project and describes any paleontological resource discoveries observed and/or recorded during the life of the project. If paleontological resources are curated, the Paleontological Resources Monitoring Report and any associated data pertinent to the curated specimen(s) should be submitted to the designated repository. A copy of the final Paleontological Resources Monitoring Report should be filed with the City.

With the implementation of the measures outlined in Mitigation Measure RHNA-PR-1, impacts to paleontological resources at the RHNA sites would be reduced to less than significant levels.

10 LITERATURE CITED

Aranda-Manteca, F.J., D.P. Domning, and L.G. Barnes. 1994. A new middle Miocene sirenian of the genus *Metaxytherium* from Baja California and California: Relationship and paleobiogeographic implications. *Proceedings of the San Diego Society of Natural History* 29:191–204.

Bailey, T.L., and R.H. Jahns. 1954. Geology of the Transverse Range Province, southern California. In *Geology of southern California*, edited by R.H. Jahns, p. 83–106. California Division of Mines Bulletin 170, Chapter II. San Francisco: State of California, Department of Natural Resources, Division of MInes.

Barboza, M., J. Parham, G.-P. Santos, B.N. Kussman, and J. Velez-Juarbe. 2017. The age of the Oso Member, Capistrano Formation, and a review of fossil crocodylians from California. *PaleoBios* 34:1–16.

Barnosky, A., C. Bell, S. Emslie, H.T. Goodwin, J. Mead, C. Repenning, E. Scott, and A. Shabel. 2004. Exceptional record of Mid-Pleistocene vertebrates helps differentiate climatic from anthropogenic ecosystem perturbations. *Proceedings of the National Academy of Sciences* 101:9297–9302.

Benton, M.J., and D.A.T. Harper. 2009. Introduction to Paleobiology and the Fossil Record. Wiley-Blackwell, a John Wiley & Sons, Ltd. Publication, West Sussex, United Kingdom, pp. 554-572.

Blake, G.H. 1991. Review of the Neogene biostratigraphy and stratigraphy of the Los Angeles Basin and implication for basin evolution. In *Active Margin Basins*, edited by K.T. Biddle, pp. 135–184. American Association of Petroleum Geologists Memoir 52.

Boessenecker, R.W., and M. Churchill. 2013. A reevaluation of the morphology, paleoecology, and phylogenetic relationships of the enigmatic walrus *Pelagiarctos*. *PLoS One* 8(1):e5411.

Brattstrom, B.H. 1961. Some new fossil tortoises from western North America with remarks on the zoogeography and paleoecology of tortoises. *Journal of Paleontology* 35(3):543–560.

California Geological Survey (CGS). 2002. *California Geomorphic Provinces*. *Note* 36:1-4. California Department of Conservation, California Geological Survey.

Calvano, G., D.P. Prothero, J. Ludtke, and E.B. Lander. 2008. Magnetic stratigraphy of the Eocene to Miocene Sespe and Vaqueros formations, Los Angeles and Orange counties, California. *Natural History Museum of Los Angeles County Science Series* 41:43-61.

Carnevale, G., T.W. Pietsch, G.T. Takeuchi, and R.W. Huddleston. 2008. Fossil Ceratoid anglerfishes (Teleostei: Lophiiformes) from the Miocene of the Los Angeles Basin, California. *Journal of Paleontology* 85(2):996-1008.

City of Chino Hills. 2015a. *General Plan*. Adopted February 24, 2015. Available at: https://www.chinohills.org/124/General-Plan. Accessed August 31, 2022.

———. 2015b. *City of Chino Hills Final Program Environmental Impact Report*. General Plan Updated. Dated February 24, 2015. Accessed August 31, 2022.

Cogstone Resource Management (Cogstone). 2011. *Paleontological and Cultural Resources of Chino Hills for the General Plan Update, City of Chino Hills, California*. February.

Connin, S., J. Betancourt, and J. Quade. 1998. Late Pleistocene C4 plant dominance and summer rainfall in the southwestern United States from isotopic study of herbivore teeth. *Quaternary Research* 50:179–193.

Cushman, J.A., and L.W. Leroy. 1938. A microfauna from the Vaqueros Formation, Lower Miocene, Simi Valley, Ventura County, California. *Journal of Paleontology* 12(2):117–126.

David, L.R. 1943. Miocene fishes of southern California. *Geological Society of America Special Paper* 43:92.

Daviess, S.N., and A.O. Woodford. 1949. Geology of the northwestern Puente Hills, Los Angeles County, California. *U.S. Geological Survey Oil and Gas Investigation*, Preliminary Map 83.

Dibblee, T.W., Jr. 2001. Geologic map of the Yorba Linda and Prado Dam quadrangles (eastern Puente Hills), Los Angeles, Orange, San Bernardino and Riverside Counties, California. Dibblee Geological Foundation, Map DF-75, scale 1:24,000.

Dickinson, W.R., and D.R. Lowe. 1966. Stratigraphic relations of phosphate- and gypsum-bearing Upper Miocene strata, upper Sespe Creek, Ventura County, California. *Bulletin of the American Association of Petroleum Geologist* 50(110):2464–2481.

Domning, D.P. 1978. Sirenian evolution in the North Pacific Ocean. *University of California Publications in Geological Sciences* 118:1–176.

Durham, D.L., and R.F. Yerkes. 1959. Geologic map of the eastern Puente Hills, Los Angeles Basin, California. U.S. Geological Survey Oil and Gas Map OM-195.

———. 1964. Geology and oil resources of the eastern Puente Hills, southern California. U.S. Geological Survey, Professional Paper 420-B:1-62.

Eisentraut, P., and J. Cooper. 2002. *Development of a Model Curation Program for Orange County's Archaeological and Paleontological Collections*. Submitted to the County of Orange Public Facilities and Resources Department/Harbors, Parks and Beaches. Fullerton: California State University.

Eldridge, G.H., and R. Arnold. 1907. The Santa Clara Valley, Puente Hills, and Los Angeles oil districts, southern California. *U.S. Geological Survey Bulletin* 309:1–266.

English, W.A. 1926. Geology and oil resources of the Puente Hills Region, California. U.S. Geological Survey Bulletin 768:1–110.

Feldmann, R.M. 2003. Decapod crustaceans from the Puente Formation (late middle to early late Miocene), California: a possible mass death. *Bulletin of the Southern California Academy of Sciences* 102:107.

Fritzsche, R.A. 1980. Revision of the eastern Pacific Syngnathidae (Pisces: Syngnathiformes), including both recent and fossil forms. *Proceedings of the California Academy of Sciences* 42(6):181–227.

Golz, D.J., and J.A. Lillegraven. 1977. Summary of known occurrences of terrestrial vertebrates from Eocene strata of southern California. *University of Wyoming Contributions to Geology* 15(1):43–65.

Graham, R.W., and E.L. Lundelius. 1994. FAUNMAP: a database documenting the late Quaternary distributions of mammal species in the United States. *Illinois State Museum Scientific Papers* XXV(1).

Hilton, E.J., and L. Grande. 2006. Review of the fossil record of sturgeons, family Acipenseridae (Actinopterygii: Acipenseriformes), from North America. *Journal of Paleontology* 80:672–683.

Hof, C.H.J., and F.R. Schram. 1998. Stomatopods (Crustacea: Malacostraca) from the Miocene of California. *Journal of Paleontology* 72(2):317–331.

Howard, H., and L.G. Barnes. 1987. Middle Miocene marine birds from the foothills of the Santa Ana Mountains, Orange County, California. *Contributions in Science, Natural History Museum of Los Angeles County* 383:1–9.

Huddleston, R.W., and G.T. Takeuchi. 2006. A new Late Miocene species of Sciaenid fish, based primarily on an in situ otolith from California. *Bulletin of the Southern California Academy of Sciences* 105:30–42.

Hudson, D., and B. Brattstrom. 1977. A small herpetofauna from the Late Pleistocene of Newport Beach Mesa, Orange County, California. *Bulletin of the Southern California Academy of Sciences* 76:16–20.

Hunt, R.M., Jr., and E. Stepleton. 2015. A skull of the immigrant Eurasian beardog *Cynelos* (Carnivora, Amphicyonidae) from the early Miocene of Southern California. *Journal of Vertebrate Paleontology* 35(1).

Jefferson, G.T. 1991a. *A Catalogue of Late Quaternary Vertebrates from California: Part One, Nonmarine Lower Vertebrate and Avian Taxa*. Technical Reports No. 5. Los Angeles, California: Natural History Museum of Los Angeles County.

———. 1991b. *A Catalogue of Late Quaternary Vertebrates from California: Part Two, Mammals*. Technical Reports No. 7. Los Angeles, California: Natural History Museum of Los Angeles County.

Kelly, T.S., and E.B. Lander. 1988. Biostratigraphy and Correlation of Hemingfordian and Barstovian Land Mammal Assemblages, Caliente Formation, Cuyama Valley Area, California. In *Tertiary Tectonics and Sedimentation in the Cuyama Basin, San Luis Obispo, Santa Barbara, and Ventura Counties, California*, edited by W.J.M. Bazeley. Pacific Section, Society of Economic Paleontologists and Mineralogists:1-19.

Kelly, T.S., and D.P. Whistler. 1994. Additional Uintan and Duchesnean (Middle and Late Eocene) mammals from the Sespe Formation, Simi Valley, California. *Contributions in Science, Natural History Museum of Los Angeles County* 439:1–29.

Leatham, W.B., and C. North. 2017. Late Miocene "great white" shark from the Puente Hills, San Bernardino County, CA: Rare preservation of vertebral centrae of a marine apex predator (*Carcharodon* sp., a lamniform elasmobranch). *Bulletin of the Southern California Academy of Sciences* 113:119.

Loel, W., and W.H. Corey. 1932. The Vaqueros Formation, Lower Miocene of California (Part 1). *University of California Publications, Bulletin of the Department of Geological Sciences* 22(3):31–410.

McDonald, H.G., and G.T. Jefferson. 2008. Distribution of Pleistocene Nothrotheriops (Xenartha, Nothrotheridae) in North America. In *Geology and Vertebrate Paleontology of Western and Southern North America*, edited by X. Wang and L. Barnes, pp. 313–331. Science Series 41. Los Angeles, California: Natural History Museum of Los Angeles County.

Miller, W.E. 1971. *Pleistocene Vertebrates of the Los Angeles Basin and Vicinity: Exclusive of Rancho La Brea*. Bulletin of the Los Angeles County Museum of Natural History 10. Los Angeles, California.

Morton, D.M., and F.K. Miller. 2006. Geologic map of the San Bernardino and Santa Ana 30' x 60' quadrangles, California. U.S. Geological Survey Open-File Report 2006-1217. Scale 1:100,000.

Murphey, P., G. Knauss, L. Fisk, T. Demere, and R. Reynolds. 2019. Best practices in mitigation paleontology. *Proceedings of the San Diego Society of Natural History* 47:1–43.

Natural History Museum of Los Angeles County (NHMLA). 2022. Unpublished collections data, June 19, 2022.

Norris, R.M., and R.W. Webb. 1990. *Geology of California.* Santa Barbara, California: John Wiley & Sons, Inc.

Pajak, A.F., III. 1992. Relating the Hemphillian Land Mammal Age to the Mohnian and Delmontian Foraminiferal Stages based on an assemblage containing marine and terrestrial faunas from the Puente Formation; Los Angeles Basin; California. *San Bernardino County Museum Association Quarterly* 39(2):24-25.

Paleobiology Database. 2022. The Paleobiology Database. Available at: https://paleobiodb.org/#/. Accessed August 1, 2022.

Pierce, W.D. 1945. Fossil arthropods of California 6. Two new fossils from the Upper Miocene of the Puente Hills. *Bulletin of the Southern California Academy of Sciences* 44(1):3–6.

Pimiento, C. 2014. *Carcharocles megalodon* unpublished collections from natural history museums around the world. Data retained in Paleobiology Database (2022).

Powell, C.L., and D.L. Geiger. 2019. Two new Miocene limpets (Fissurellidae) from southern California, with notes on other fossil occurrences of the family in northwestern North America. *PaleoBios* 36(46304):1–7.

Prothero, D.R., and E.H. Vance, Jr. 1996. Magnetostratigraphy of the upper middle Eocene Coldwater Sandstone, central Ventura County, California. In *The Terrestial Eocene-Oligocene Transition in North America*, edited by D.R. Prothero and R.J. Emry:140-156.

Reynolds, R.E., and R.L. Reynolds. 1991. The Pleistocene beneath our feet: Near-surface Pleistocene fossils in inland Southern California basins. In *Inland Southern California: The Last 70 Million Years*, edited by M.O. Woodburne, R.E. Reynolds, and D.P. Whistler, pp. 41–43. San Bernardino County Museum Special Publication 38(3 and 4).

Rigby, J.K., and Y. Albi. 1996. An Upper Miocene hexactinellid sponge from the Puente Shale, Orange County, California. *Journal of Paleontology* 70(6):908–913.

Roy, K., J. Valentine, D. Jablonski, and S. Kidwell. 1996. Scales of climatic variability and time averaging in Pleistocene biotas: Implications for ecology and evolution. *Trends in Ecology and Evolution* 11:458–463.

San Bernardino County Museum (SBCM). 2022. Paleontology records review for City of Chino Hills Jurisdictional Area, Paleontological Technical Study, San Bernardino County, California. August 18, 2022.

Sandom, C., S. Faurby, B. Sandel, and J.-C. Svenning. 2014. Global late Quaternary megafauna extinctions linked to humans, not climate change. *Proceedings of the Royal Society B* 281:20133254.

Santos, G.P., J.F. Parham, and B.L. Beatty. 2016. New data on the ontogeny and senescence of *Desmostylus* (Desmostylia, Mammalia). *Journal of Vertebrate Paleontology*. DOI: 10.1080/02724634.2016.1078344.

Saul, L.R., and C.J. Stadum. 2005. Fossil argonauts (Mollusca: Cephalopoda: Octopodida) from late Miocene siltstones of the Los Angeles Basin. California. *Journal of Paleontology* 79:520–531.

Scherzer, B. 2017. A possible physeteroid (Cetacea: Odontoceti) from the Yorba Member of the Puente Formation, Orange County, California. *PaleoBios* 34:11–12.

Schoellhamer, J.E., D.M. Kinney, R.F. Yerkes, and J.G. Vedder. 1954. Geologic map of the northern Santa Ana Mountains, Orange and Riverside Counties, California. U.S. Geological Survey Oil and Gas Investigations, Map OM 154.

Scott, E. 2010. Extinctions, scenarios, and assumptions: changes in latest Pleistocene large herbivore abundance and distribution in western North America. *Quaternary International* 217:225–239.

Scott, E., and K. Springer. 2003. CEQA and fossil preservation in Southern California. *The Environmental Monitor* 4–10.

Society of Vertebrate Paleontology (SVP). 1995. Assessment and Mitigation of Adverse Impacts to Nonrenewable Paleontologic Resources: Standard Guidelines. *SVP News Bulletin* 163:22–27.

———. 2010. *Standard Procedures for the Assessment and Mitigation of Adverse Impacts to Paleontological Resources*. Society of Vertebrate Paleontology. Available at: https://vertpaleo.org/wp-content/uploads/2021/01/SVP_Impact_Mitigation_Guidelines.pdf. Accessed July 30, 2022.

Springer, K., E. Scott, J.C. Sagebiel, and L.K. Murray. 2009. The Diamond Valley Lake local fauna: late Pleistocene vertebrates from inland southern California. In *Papers on Geology, Vertebrate Paleontology, and Biostratigraphy in Honor of Michael O. Woodburne*, edited by L.B. Albright III, pp. 217–236. Museum of Northern Arizona Bulletin 65. Flagstaff, Arizona: Museum of Northern Arizona.

Stinson, A.L., M. Izzi, L. Mirallegro, and L. Tewksbury. 2005. Mid-Miocene cetacean fossils, Paularino Member, Topanga Formation, western San Joaquin Hills, Orange County, California. *Geological Society of America Abstracts with Programs* 37(4):45.

University of California Museum of Paleontology. 2022. Fossil Locality Database. Available at: https://ucmp.berkeley.edu/collections/databases/. Accessed July 22, 2022.

VanderHoof, V.L. 1937. A study of the Miocene sirenian *Desmostylus*. *University of California Publications in Geological Sciences* 24(8):169–262.

Wang, X., R.H. Hunt, Jr., R.H. Tedford, and E.B. Lander. 2009. First record of immigrant *Phoberogale* (Mammlia, Ursidae, Carnivora) from Southern California. *Geodiversitas* 31(4):753–773.

Whistler, D.P., and E.B. Lander. 2003. New late Uintan to early Hemingfordian land mammal assemblages from the undifferentiated Sespe and Vaqueros Formations, Orange County, and from the Sespe and equivalent marine formations in Los Angeles, Santa Barbara, and Ventura Counties, Southern California. *Bulletin of the American Museum of Natural History* 279:231–268.

Wiedey, L.W. 1928. Notes on the Vaqueros and Temblor formation of the California Miocene with descriptions of new species. *Transactions of the San Diego Society of Natural History* 5(10):95–182.

Woodburne, M.O. (ed.). 1987. *Cenozoic Mammals of North America: Geochronology and Biostratigraphy*. Berkeley: University of California Press.

Yerkes, R.F. 1972. Geology and oil resources of the western Puente Hills area, southern California. U.S. Geologic Survey, Professional Paper 420-C:1–63.

Yerkes, R.F., and R.H. Campbell. 1979. Stratigraphy nomenclature of the central Santa Monica Mountains, Los Angeles County, California. U.S. Geological Survey, Bulletin 1457-E:1–31.

Yerkes, R.F., T.H. McCulloh, J.E. Schoellhamer, and J.G. Vedder. 1965. Geology of the Los Angeles Basin, California – An Introduction. U.S. Geological Survey, Professional Paper 420-A:1–57.

APPENDIX A

San Bernardino County Museum
Paleontological Records Search

CONFIDENTIAL – NOT FOR PUBLIC RELEASE

2024 Orange Tree Lane, Redlands, California 92374 | Phone: 909.798.8608
www.SBCounty.gov

SAN BERNARDINO COUNTY

Museum
Division of Earth Science

Scott Kottkamp
Curator of Earth Science

18 August, 2022

SWCA Environmental Consultants, Inc.
Attn: Mathew Carson
51 W. Dayton Street
Pasadena, CA 91105

PALEONTOLOGY RECORDS REVIEW for City of Chino Hills Jurisdictional Area paleontological technical study, San Bernardino County, California

Dear Mr. Carson,

The Division of Earth Science of the San Bernardino County Museum (SBCM) has completed a records search for the above-named study in San Bernardino, California. The proposed study site is the entire jurisdictional area of the city of Chino Hills, California as shown on the United States Geological Survey (USGS) 7.5 minute San Dimas, Ontario, Prado Dam, Yorba Linda, and Black Star Canyon, California quadrangles.

Geologic mapping of the area by Morton and Miller (2006), Dibblee and Minch (2002), Dibblee and Ehrenspeck (2001), Schoellhamer et al. (1981), and Durham and Yerkes (1964) indicates that the majority of Chino Hills is situated atop a thick uplifted zone of Cenozoic sedimentary rock. This uplifted zone, the Puente Hills, is formed out of a series of anticlines and synclines with the majority of the units exposed at the surface being of Miocene age and marine origin. In rough order from oldest to youngest, these units are: the Sespe Formation (Tsp); the Topanga Sandstone (Ttp); and the Puente Formation, which includes the La Vida Shale Member (Tplv), Soquel Sandstone Member (Tpsq), Yorba Shale Member (Tpy), and Sycamore Canyon Member (Tpsc) (Morton and Miller 2006). The Puente Formation accounts for the largest majority of both surface exposure and subsurface thickness in the jurisdictional area of Chino Hills (Dibblee and Ehrenspeck 2001). Other older and younger lithified units are exposed at the surface just outside of Chino Hills, most notably in the south. The Pliocene Fernando Formation

BOARD OF SUPERVISORS
Col. Paul Cook (Ret.) First District | Janice Rutherford Second District | Dawn Rowe Vice Chair, Third District | Curt Hagman Chairman, Fourth District | Joe Baca, Jr. Fifth District
Leonard X. Hernandez Chief Executive Officer

(Tf) and early Pleistocene Lab Habra Formation (Qlh) are exposed in Yorba Linda at the foothills of the Puente Hills across the Whittier Fault (Dibblee and Ehrenspeck 2001). The Oligocene Vaqueros Formation (Tv), Eocene Santiago Formation (Tsa), Paleocene Silverado Formation (Tsl), and late Cretaceous Ladd Formation (Ka, Kcg, Kcgr) have surface exposures just south of the Santa Ana River, along the north face of the Santa Ana Mountains (Dibblee and Ehrenspeck 2001; also in Morton and Miller 2006 with different abbreviations). Igneous units occur just outside of Chino Hills to the north and south (Santa Ana Mountains and some exposures in San Dimas), but there seem to be no known occurrences within Chino Hills itself (Morton and Miller 2006; Dibblee and Minch 2002; Dibblee and Ehrenspeck 2001). Some of the units not found at the surface within Chino Hills may be found at depth, see cross section B-B' from Dibblee and Ehrenspeck (2001) for an example (Figure 1).

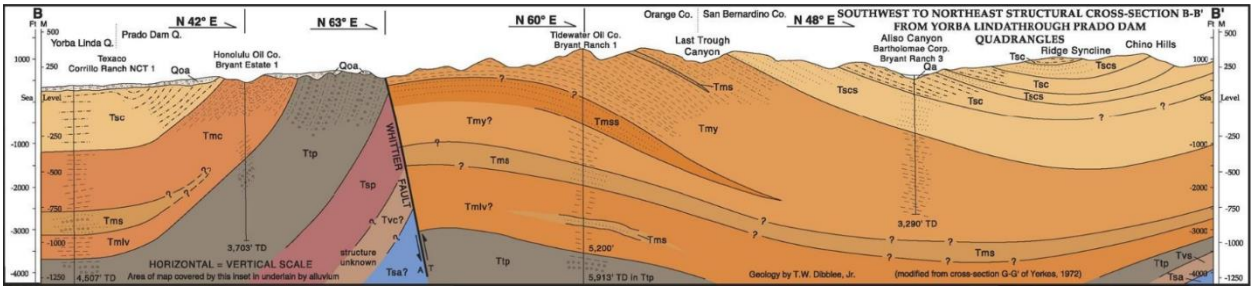


Figure 1: Cross section of the southeastern Puente Hills from Dibblee and Ehrenspeck (2001). The right half of the cross section is exemplary of the general stratigraphy of the Puente Hills, though faulting and folding can drastically alter local geology.

Pleistocene (Qoa) and Holocene (Qa) age alluvium fills in discrete areas such as valleys and canyons created by runoff and fluvial systems. The latter range in size from small creeks to the bed of the Santa Ana River in the region between the Puente Hills and the Santa Ana Mountains. Much thicker alluvial deposits border the Puente Hills, especially in the east (Reynolds 1989; Morton and Miller 2006). Alluvium is variable in its composition, often resembling a poorly indurated mixture of the units from which its sediment was sourced. Qa is unlikely to be fossiliferous, but Qoa is highly fossiliferous throughout Los Angeles, Riverside, and San Bernardino counties, yielding the remains of mastodons, mammoths, *Smilodon*, camels, horses, bison, and ground sloths, as well as microfossils including rodents (Reynolds and Reynolds 1991). In the city of Chino Hills, this alluvium directly and unconformably overlies the Puente Formation; outside the city's jurisdiction, the Pliocene age Fernando Formation (Dibblee and Ehrenspeck, 2001) or an unnamed Pleistocene age sandstone (Reynolds 1989) sometimes underlies Quaternary alluvium instead.

The Miocene age Puente Formation is equivalent in age to the Monterey Formation found elsewhere in southern California, and shares its combination of siliceous, diatomaceous, and organic siltstones and shales. However, the Puente Formation is distinguished from the Monterey

Formation via its thick and widespread clastic units, especially those containing coarse grained sediments (Scott 1998). The Puente Formation has multiple fossiliferous members, producing fossils of marine vertebrates and invertebrates. Bivalves, gastropods, and microinvertebrates like diatoms and foraminifera are common, fish are uncommon though abundant in select localities, and cetaceans are rare. A new species of dolphin has been found in the formation (Valleri Patel, personal comm. 2022). Terrestrial plant fossils are also common in several units of the Puente Formation.

The Sycamore Canyon Member is the youngest unit of the Puente Formation. Late Miocene in age (specifically Upper Mohnian and Lower Delmontian), the Sycamore Canyon member is comprised of three moderately indurated clastic marine facies: a micaceous, vaguely to moderately bedded grey silt, which has localized nodular zones and lenses of fine-grained grey-brown sandstone (Tpsc); a coarse to fine-grained and arkosic sandstone that ranges in color from brown to light grey and even white near Prado Dam (Tpscs), with localized conglomerate; and a light grey, bedded, and partially nonmarine conglomerate comprised of cobble to pebble sized clasts, mostly granitic though diorite, gneiss, and quartzite are also present (Tpscc). The Sycamore Canyon Member displays a depth gradient, which generally shallows upwards from the base of the member. The basal 900 feet of the unit represent sparsely fossiliferous deep water strata (> 2000 ft.) containing mostly foraminifera, while the uppermost units to the east (especially near Prado Dam) were deposited nearer to shore and are richly and diversely fossiliferous (Reynolds 1989). Upper Tpsc is the most fossiliferous facies of the Sycamore Canyon member and contains some splendidly preserved fish, sharks, whales, a sea turtle, diverse invertebrates, and terrestrial plant remains. Tpscc is the least fossiliferous facies, with isolated shell fragments.

Underlying the Sycamore Canyon Member is the Middle Miocene Yorba Shale member (Tpy), which is a moderately-lithified, thin-bedded, light grey to yellow to white, siliceous to silty shale (Dibblee and Ehrenspeck 2001). The Yorba Shale is the most productive member of the Puente Formation, especially in the north and east of the Puente Hills. Tpy also has localized occurrences of yellowish dolomite, thin layers of fine-grained sandstone, and white siliceous shales that are heavily diatomaceous (Durham and Yerkes 1964; Schoellhamer et al. 1981). The well-laminated sandstone units were probably deposited by turbidity currents from shallower depths (Reynolds 1989). Diatoms, foraminifera, fish scales, and fish skeletons comprise the bulk of the fossil record in Tpy, which combined with the lithology suggests a deep water paleoenvironment of depth exceeding 1800 feet (Reynolds 1989).

Underlying Tpy is the Middle Miocene Soquel Sandstone (Tpsq), which is prominently exposed in Soquel Canyon. This unit is bedded, light grey to tan when weathered, medium-grained, and arkosic, with local patches of coarser grains and pebbles, biotite, and silty grey shale

units (Reynolds 1989; Dibblee and Ehrenspeck 2001). Fossils found within Tpsq include mollusks, foraminifera, cetacean bone, shark teeth, and coral (Reynolds 1989). The fossils often display a fragmented or even crushed taphonomy, though some Tpsq localities have taphonomy and fossil assemblages similar to Tpy instead. Underlying Tpsq is the Middle Miocene La Vida Shale Member (Tplv), which is thin-bedded, cream-white, platy, and siliceous to semi-siliceous. Like Tpy, Tplv also includes yellow-grey dolomite and thin sandstone strata. Diatoms are the most common fossils in Tplv, with foraminfera also present and more common in the Santa Ana Mountains (Durham and Yerkes 1964; Reynolds 1989). No macrofossils have been found in Tplv of the Puente Hills. Finally, Dibblee and Ehrenspeck (2001) record several additional unnamed units in the southern Chino Hills of comparative age to the above three members. Diatoms are a common microfossil in Tpy and Tplv, and partially account for the siliceous nature of the stone (Durham and Yerkes 1964).

Underlying all of Tp is the Middle Miocene Topanga Formation (Ttp). Ttp is a marine, clastic, moderately lithified, light grey to tan, bedded, fine to medium grained, and arkosic sandstone with localized pebbly inclusions (Dibblee and Ehrenspeck, 2001). Thin interbeds of micaceous siltstone also occur. Fossil mollusks are the most common fossils in Ttp, with fish scales and foraminifera also present. The foraminifera and mollusks present indicate a shallow water to near shore paleoenvironment (Schoellhamer et al. 1981; Reynolds 1989). This unit is rarely exposed within the City of Chino Hills, occurring south of the Scully Hill Fault near Green River Golf Club where the unit is folded upwards toward the surface. Elsewhere in the City of Chino Hills, Ttp is buried deeply below Tp (Figure 1). Deep well bores and excavation conducted near the southern faults may penetrate Ttp, however. The formation is more commonly exposed in eastern Yorba Linda.

Underlying Ttp is the Early Miocene Sespe Formation (Tsp), which is terrestrial in origin. Though Tsp elsewhere ranges from Late Eocene to Early Miocene in age (Schoellhamer et al. 1981; Reynolds 1989), Dibblee and Ehrenspeck (2001) list the local exposures as Early Miocene exclusively. Tsp is split into two major facies, red beds of red-pink sandstone or silty claystone and cobble conglomerate. The former accounts for the only surface exposure in the City of Chino Hills, which like Ttp occurs at the southern edge of the Green River Golf Club bordering the Santa Ana River. No fossils have been found from Tsp within the City of Chino Hills, but nearby exposures in the Santa Ana Mountains have produced fossil vertebrates (Durham and Yerkes 1964). Units older than Tsp are buried so deeply under the City of Chino Hills as be outside the scope of this report.

For this review, I conducted a search of the Regional Paleontological Locality Inventory (RPLI) at the SBCM. The results of this search indicate that 351 localities have been discovered

within the programmatic project area, with over 100 additional specimens from the same strata located within 5 miles of the perimeter. No paleontological resources have been found within the 9 specific project areas of special interest, but several project areas have known localities near their borders and all have at least one locality from alike sediments within a mile. The following will discuss each specific project site and all paleontological localities found within a mile of their perimeters, followed up by an overview of localities in the broader jurisdictional area, and finishing with a summary of other fossiliferous regions nearby.

Project areas the Shoppes and the Shoppes II are situated atop Qa. There are no known localities within the project areas, but 38 SBCM localities occur within a mile of the site in multiple units. SBCM 1.116.319 is the closest locality, found in Qoa underlying surficial Qa between the canal and highway 71 0.21 miles northeast of The Shoppes northeasternmost corner. The sediment is a green clayey silt with caliche; there is no mention of how far it was located beneath the surface. Taxa found at the site include: Gastropoda indet.; Limacidae indet.; *Succinea* sp.; *Physa* sp.; *Anniella* sp.; *Aspidoscelis* sp.; *Cnemidophorus* sp.; *Trimorphodon* sp.; Leporidae indet.; *Thomomys* sp.; Heteromyidae indet.; *Microtus* sp.; and Vertebrata indet (Scott 1998). Fossils are fragmental to incomplete, disarticulated, disassociated, and unaltered to lightly permineralized. Taphonomy and sedimentology of the gastropods are consistent with a freshwater fluvial or flood plain system. Though the site was dated as late Pleistocene, many of the lizards are modern inhabitants of the region and their remains may be of recent origins. Nearby SBCM 1.116.318 is found only slightly further north in the same unit of Qoa. *Physa* sp., *Perognathus* sp., *Thomomys* sp., *Ammospermophilus* sp., and indeterminate vertebrate and mammal fossils are found there.

From 0.35 to 0.65 miles to the north of the Shoppes, SBCM localities 1.116.304 – 1.116.317 and 1.116.320 – 1.116.330 lie between residential housing on Royal Ridge road and highway 71. These localities are within Tpy, represented by a yellow to orange shale interbedded with sandstone, thinly covered by topsoil, and are highly fossiliferous. Permineralized fish bones and scales make up the bulk of the fossil assemblage here, often found as articulated partial to complete skeletons (Scott 1998). Some of the fish specimens also preserve muscle or flesh via carbonization or impression. Plant impressions, both terrestrial and marine, are the second most common constituent and recrystallized bivalves or impressions thereof are tertiary. Taxa found at these localities include: Mollusca indet.; Bivalvia indet.; *Pernopecten* sp.; *Ensis* sp.; Gastropoda indet.; *Olivia* sp.; cf. *Polinices* sp.; Asteroidea indet.; Chondrichthyes indet.; *Triakis* sp.; *Isurus* sp.; Osteichthyes indet.; Clupeidae indet.; †*Ganolytes* sp., †*G. cameo*; †*Xyne grex*; Bathylagidae indet.; †*Chauliodus eximius*; Myctophidae indet.; Moridae indet.; Atherinidae indet.; Belonidae indet.; *Syngnathus* sp.; Scorpaenidae indet.; *Sebastes* sp.; †*Lompoquia* sp.; Scombridae indet.; *Scomber* sp.; cf. †*Thrysocles* sp.; Pleuronectiformes indet.; Cetacea indet.; Pinnipedia indet.; Plantae indet.; *Magnolia* sp.; *Laurus* sp.; *Persea* sp.; *Umbellularia* sp.; cf. *Rhus* sp.; *Platanus* sp.;

cf. *Alnus* sp.; *Quercus* sp.; *Populus* sp.; *Salix* sp.; cf. *Washingtonia* sp.; and †*Paleohalidrys* sp (Scott 1998). Based on the fossil assemblage, quality of preservation, and the sedimentology of the localities, the depositional environment is hypothesized to be calm and deep water with transported remains of nearshore and terrestrial taxa, as is typical for the Puente Formation (Scott 1998).

SBCM 1.116.265 – 1.116.268 are located 0.35 – 0.6 miles west of the Shoppes and 0.6 – 0.9 miles north-northwest of Park Overflow. Locality records claim these sites belong to Tpsq, but the description of the thickness and yellow-brown color of the shale strata suggest Tpy instead. Dibblee and Ehrenspeck (2001) and Dibblee and Minch (2002) indicate the surface rock is Tpy, and the rock at these localities is buried shallowly under a thin layer of soil. Taxa found at the sites include: Echinodermata indet.; Molluca indet.; Chondrichthyes indet.; Osteichthyes indet.; Clupeidae indet.; Plantae indet.; coprolites; and worm burrows. Body fossils from these sites are all small, fragmental, and of limited diagnostic value. The burrow traces are much better preserved, and suggest a level of bioturbation in the paleoenvironment that may partially explain the taphonomic condition of the other fossils. This bioturbation suggests an active and oxygenated seafloor, which contrasts with many Tpy sites in the region that exhibit high quality preservation due to deposition in calm and anoxic environs.

SBCM 1.116.262 – 1.116.264 are located approximately 0.8 miles north-northwest of the Shoppes, along a portion of Chino Avenue. Assorted unidentifiable chordate and plant fossil fragments were found within a yellowish shale with bedding and sedimentary features matching Tpy. The fossiliferous unit was shallowly buried under the soil. Slightly further away, 1 mile north-northwest of the Shoppes, SBCM 1.116.301 – 1.116.303 are located within what is now a Lowe's Hardware. Unaltered Heteromyidae teeth and mammalian bones were found in a light green silty sand similar to a coarser version of the sediment found at 1.116.319 (Scott 1998). Underlying that sand, however, was a progression of increasingly clayey units grading in color from green, to orange, and finally to grey and diatomic off-white shales belonging to Tpy. The intervening layers contain mixed fossils of Pleistocene terrestrial and Miocene marine origin, the former as isolated or fragmentary elements, while the shales mostly contain well preserved fish fossils including complete skeletons. It is likely that the mixed units represent reworking of Miocene sediment during the Pleistocene. Taxa found at the sites include: *Isurus* sp.; *Triakis* sp.; Actinopterygii indet.; Teleostei indet.; Scombridae indet.; Clupeidae indet.; †*Ganolytes cameo*; Bathylagiae indet.; Belonidae indet.; *Syngnathus* sp.; cf. Pennipedia indet.; Heteromyidae indet.; †*Paleohalidrys californica*; Phaeophyta indet.; Thallophyta indet.; and *Platanus* sp. Bones are mildly permineralized for Pleistocene age specimens, not responding to a burn test, and permineralized for Miocene age ones. Note that this was the first record of *Triakis* from the Puente Formation.

Project area Park Overflow is situated atop Qa directly overlying Qoa and then Tpy in turn. There are no known localities within the project area, but Gordon Ranch and Coral Ridge immediately to the southwest are densely populated by numerous richly fossiliferous localities. Approximately 128 fossil localities are situated within 2 miles of Park Overflow, forming a rough NE – SW line, with the closest locality (1.116.85) occurring 0.25 miles southwest of Park Overflow. Localities include: SBCM 1.116.80 – 1.116.109; 1.116.122 – 1.116.179; SBCM 1.116.215 – 1.116.233; SBCM 1.116.235 – 1.116.240; SBCM 1.116.246 – 1.116.253; and SBCM 1.116.255 – 1.116.261. These localities are located within the same units at or underlying Park Overflow, including Qoa, Tpy, and Tpsq, suggesting the likelihood for fossils to occur at Park Overflow is very high. Quarternary taxa found at the sites near Park Overflow include: *Bison* sp.; *Equus* sp.; indeterminate bone fragements; and herbivore coprolites. These fossils are lightly permineralized, indicating a Pleistocene age.

Taxa found near Park Overflow from the Yorba Member include: Porifera indet. spicules; Mollusca indet.; *Delectopecten* sp.; Gastropoda indet.; *Allocentrotus fragilis* (= *Strongylocentrotus fragilis*); Decapodiformes indet.; *Isurus* sp.; *Squatina* sp.; Osteichthyes indet.; †*Etringus* sp.; Clupeidae indet.; †*Ganolytes* sp., †*G. cameo*; †*Xyne grex*; Argentinidae indet.; Bathylagidae indet.; †*Bathylagus* cf. *quasita* var. *angelensis*; cf. †*Chauliodus eximus*; *Cyclothone* sp.; *Lampanyctus* sp.; cf. Hemiramphidae indet.; Myctophidae indet.; †*Eclipes* sp.; †*Pseudoseriola gillilandi*; Carangidae indet.; Scorpaenidae indet.; Syngnathidae indet.; *Syngnathus* sp., †*S.* cf. *avus*, †*S. emeritus*; *Seriola* sp.; †*Lompoquia* cf. *retropes*; Scombridae indet.; cf. *Sarda* sp.; †*Thyrsocles kreigeri*; †Euzaphlegidae indet.; Pleuronectiformes indet.; Mammalia indet.; Cetacea indet.; coprolites; †*Chondrites ramulosa*; Plantae indet.; *Sequoia* sp.; *Alnus* sp.; *Quercus* sp.; *Magnolia* sp., *M. grandiflora*; *Persea* sp.; *Sassafrass* sp.; *Umbellularia* sp.; *Platanus racemosa*; *Phragmites* sp.; †*Julescraneia grandicornis*; †*Paleohalidrys* sp., †*P. linearis*, †*P. linguliformis*, †*P. occidentalis*; †*Paleocystophora lacerodentata*; †*Chondrides flexilis*; Foraminifera indet.; †*Praebulimina obtusa*; *Eubuliminella subfusiformis*; *Kleinpella californiensis*; cf. *Virgulina vaughni*; †*Bolivina barbarana, B. brevior,* †*B. costata,* †*B. girardensis,* †*B. marginata*; †*Uvigerina subperegrina*; *Epistominella subperuviana*; *Globigerina* sp.; Spumellaria indet. Lithology is mostly alternating thin beds of light-grey shale, sandstone, and siltstone; there are also distinct and intermittent yellow-brown sandstone units. Mesopelagic fish fossils are common in local Tpy, but are not as well preserved as those found at SBCM 1.116.12 – 1.116.17 (see section on Los Serranos Golf Course, below), frequently occurring as incomplete skeletons or isolated elements. Because mesopelagic fish remains do not frequently survive significant transport, their presence here suggests a relatively deep water depositional environment (Reynolds et al. 1985; Reynolds 1989). However, the presence of nearshore fish taxa and moderately preserved terrestrial plants also suggest the environment must have been adjacent to a nearshore source. Deep water continental shelf, with a seafloor around the

oxygen minimum zone and supplied with sediment by a low gradient freshwater source, would match with the vertebrate and plant fossil assemblage present. This depositional environment is further supported by the assemblage's benthic Foraminifera, with *Bolivina* frequently being found in deep and oxygen depleted water on the outer continental shelf. An alternative to the singular depositional environment proposed by Reynolds (1989), for similar sites in the Puente Hills, would be time averaging of a depth gradient over sequences of transgressions and regressions. Additional research on the local stratigraphy and the precise stratigraphic positions of mesopelagic versus epipelagic and neritic taxa is needed to test these hypotheses.

Taxa found near Park Overflow from the Soquel Member include: Porifera indet. spicules; Osteichthyes indet.; Clupeidae indet.; †*Ganolytes cameo*; †*Xyne grex*; †*Bathylagus* cf. *quasita* var. *angelensis*; †*Chauliodus eximus*; *Lampanyctus* sp.; †*Eclipes* sp.; †*Syngnathus* cf. *avus*; †*Pseudoseriola gillilandi*; †*Lompoquia* cf. *retropes*; Thunnini indet., †*Thyrsocles kreigeri*; Cetacea indet.; coprolites; †*Chondrites ramulosa*; Plantae indet.; *Juniperus* sp., †*Populus* cf. *alexanderi*; *Salix* sp.; *Acer* sp.; *Quercus* sp.; *Magnolia grandiflora*; *Persea* sp.; *Sassafras* sp.; *Umbellularia* sp.; *Platanus racemosa*; *Amelanchier pallida*; *Sabal* sp.; *Phragmites* sp.; †*Paleohalidrys californica*, †*P. dendritica*, †*P. linearis*, †*P. linguliformis*, †*P. lompocensis*, †*P. occidentalis*, †*P. superba*; †*Cystoseirites ornatus*; †*Paleocystophora acuminata*, †*P. lacerodentata*; †*Chondrides recurva*, †*C. flexilis*; †*Delesserites acuminata*. The Soquel Canyon Member here is represented by alternating thin beds of light grey and green silty shales between thicker units of massive, brown, and medium-grained sandstone. Mesopelagic fish are rare to absent in the sandstone units, while terrestrial plants and marine algae are more common. The paleoenvironment of the Tpsq shale units at Coral Ridge and Gordon Ridge appears to have been similar to that of the Yorba Member, with a mixture of shallow and deep open water fish taxa, mixed with some near-shore taxa and terrestrial plant fossils, within a fine grained lithology suggestive of a relatively calm depositional environment. The medium-grained sandstone units, on the other hand, may have been deposited at shallower depth given the lesser abundance of mesopelagic taxa.

Project area The Commons is situated atop recent alluvium deposited by Chino Creek. There are no known localities within the project area, but the site is likely underlain by Qoa at unknown depth. Furthermore, SBCM 1.116.290 is located less than 0.15 miles southeast from The Commons, at 33°58'50''N 117°41'52''W. This locality is located in an undescribed unit of Qoa underlying as little as five feet of Qa. Fossils are fragmental and unaltered to lightly permineralized, with taxa including: Gastropoda indet.; Chordata indet.; Mammalia indet.; and Rodentia indet. The other localities within a mile of The Commons are SBCM 1.116.338 – 1.116.350, which are in an east-to-west line along Little Chino Creek west of Ramona Avenue. The Qoa here consists of stratigraphically layered, poorly-sorted, olive green units of wet clay, silt, and sand interspersed with a dark-yellowish brown mud and a brown sand, which underlies

the surface Qa by as little as three feet and extends down to nine feet. At nine feet, further cuts revealed green-black featureless clay that produced no fossils; the underlying Puente Formation was not revealed during the excavation of these localities (Scott 1999). A diverse Quaternary fauna was recovered from these localities, including: Bivalvia indet.; Gastropoda indet.; Chordata indet.; Galeomorpha indet.; Anura indet.; *Bufo* sp.; Squamata indet.; *Phrynosoma* sp; cf *Uta stansburiana*; Colubridae indet.; *Masticophis* sp.; Aves indet.; Mammalia indet.; Soricidae indet.; *Scapanus* sp.; *Sylvilagus* sp.; Rodentia indet.; Cricetidae indet.; *Microtus* sp.; *Peromyscus* sp.; cf. *Reithrodontomys* sp.; Heteromyidae indet.; *Chaetodipus* sp.; *Diplodomys* sp.; *Perognathus* sp.; Sciuridae cf. *Ammospermophilus* sp.; *Thomomys* cf. *bottae*; and *Bison* sp. Fossils occur as lightly permineralized and isolated, sometimes fragmentary, elements – a flame test produced no noticeable odor (Scott 1999). The presence of abundant *Thomomys* and *Scapanus* suggests a mesic environment with cool and moist soils. The isolated shark tooth is reworked from the underlying Puente Formation. Scott (1999) contains much more detailed information about these sites, beyond the parameters of this report.

Project area Western Hills Golf Course is situated atop Tpsq, with a band of Qa stemming from Sleepy Hollow infilling low points in the topography. There are no known localities within the project area, but Coral Ridge Park is within a mile to the north. Thus, Western Hills Golf Course occurs in the same sediments as several nearby Soquel Sandstone localities accounted for in the preceding section on Park Overflow. The closest locality to Western Hills Golf Course is SBCM 1.116.246, 0.65 miles to the north, which produced an isolated Clupeidae scale and some unidentified petrified wood from within grey colored Tpy.

Project areas Wang (High-Density), Canyon Estates, and Wang (Medium-Density) have no localities present within their bounds. However, these sites are located atop Qa, Qoa, Tmy, Tsc, and Tscs, of which the latter three are fossiliferous throughout the Puente Hills. More specifically, both Wang project areas have surface exposures of Qa and Tmy, while Canyon Estates is located atop Qa, Qoa, Tsc, and Tscs. Note that Qoa often underlies Qa and Tsmy will underlie Tsc. Of these, Qoa and Tsc are of particular interest given the potential for macrovertebrate fossils. The closest locality to all three of these sites is SBCM 1.116.111, which is just outside the perimeter of Wang (High Density)'s northeast corner at 33°57'54''N 117°42'57''W. This locality occurs within a grey shale corresponding to Tpy. A list of taxa for this site cannot be provided, as only field numbers of specimens were listed on the locality card and the specimens could not be located in time to complete this report. SBCM 1.116.111 was part of the same project as SBCM 1.116.112 – 1.116.117, discussed below regarding Los Serranos Golf Course, and the fossil assemblage described for those localities can be considered representative of SBCM 1.116.111. As a result, this locality and its immediate vicinity are highly likely to produce many well-preserved fossils from a Miocene marine deep water environment (Reynolds 1989).

The next closest locality to Wang and Canyon Estates is SBCM 1.116.24, Robert O. Townsend High School, at a distance of about 0.7 miles north of Wang (Reynolds et al. 1985). Sediments at the site correspond to Upper Tpsc, locally represented by alternating beds of dark grey-green fine-grained shale and iron-stained sand (Reynolds et al. 1985). The beds vary in thickness from 0.3 – 15.2 cm (1/8th – 6 inches) and part easily at bedding planes. Isolated instances of other bed-scale units also occur, such as a basal grey clay resembling bentonite and several thin beds of highly indurated and resistant sandstone between shale sequences. However, the alternating shale beds contain most of the fossils found at this locality (Reynolds et al. 1985). More than 3500 specimens were collected from SBCM 1.116.24. Taxa found include: *Delectopecten* sp.; Crustacea indet.; *Cetorhinus* sp.; Osteichthyes indet.; Clupeidae indet.; †*Ganolytes cameo*; †*Xyne grex*; *Engraulis* sp.; *Bathylagus* sp.; †*Chauliodus eximius*; Myctophidae indet.; *Eclipes* sp.; Scorpaenidae indet.; †*Protanthias fossilis*; Percichthyidae indet.; cf. *Anoploploma* indet.; †*Pseudoseriola gillilandi*; *Seriola* sp.; †*Lompoquia* sp., †*L. retropes*; cf. *Sphyraena* sp.; †*Araeosteus rothi*; Scombridae indet.; †*Zaphleges* sp., †*Z. longurio*; Perciformes indet.; Pleuronectiformes indet.; †*Psephophorus* sp.; *Puffinus* sp.; Balaenopteridae indet.; †*Chondrites ramulosa*; Plantae indet.; cf. *Sabal* sp.; *Smilacina* sp.; *Phragmites* sp.; *Platanus* sp.; *Populus* sp.; *Salix* sp.; *Alnus* sp.; *Betula* sp.; *Sassafras* sp.; *Umbellularia* sp.; *Persea* sp.; *Quercus* sp., †*Q. convexa*; *Magnolia* sp.; *Malva* sp.; *Amelanchier* sp.; Thallophyta indet.; †*Julescraneia grandicornis*; †*Paleohalidrys* sp., †*P. liguliformis*, †*P. occidentalis*, †*P. accuminata*; *Chondrides* sp., †*C. recurva*; Foraminifera indet.; †*Robulus cf. miocenicus*; *Buliminella* sp. (3 species); *Bolivina* sp. (4 species); Uvigerina sp. (2 species); *Siphogenerina* sp.; *Siphogenerina* sp.; *Valvulineria* sp.; and cf. *Cibicides* sp. (2 species). Sedimentology and the fossil assemblage include both near-shore forms and mesopelagic fishes, with taphonomy suggesting little to no transport for these specimens. The presence of well-preserved mesopelagic fishes suggests deep water, but the relative abundance of near-shore specimens corresponds better to nearshore sites 120 – 300 ft. deep. Specimens are often found articulated, with minimal damage, and even terrestrial leaves display only moderate wear. However, the presence of worm burrows suggests the depositional environment was not anoxic. Reynolds et al. (1985) suggests a depositional environment just above or at the oxygen minimum zone, which would limit decay while not being fully anoxic. A low gradient fresh water source would be needed nearby to raft the terrestrial leaves. It is also possible that facies changes within the locality reflect a fluctuating depth gradient, with the effect of time averaging species from different depths across the locality, but further research is needed to test this hypothesis. Reynolds et al. (1985) contains a more fully detailed account of this site and associated mitigation work, beyond the parameters of this report.

Project Area Los Serranos Golf Course is situated atop several units. Beginning in the north, there is a thin strip of surficial exposed Qoa along County Club Drive, but moving further

south this unit is covered by Qa. The southern portion of the project area is quite complex at the surface, transitioning from Tpy in the west, to localized mixtures of Qa, Qoa, and Tpsc. Just east of the project site border is a fault, which uplifts Tpsq to the surface on the far side. SBCM 1.116.111, discussed previously, is the closest locality at 0.2 miles to the west. The next closest localities are SBCM 1.116.12 – 1.116.17, which run along Soquel Canyon Parkway 0.6 – 0.7 miles to the southeast of Los Serranos Golf Course. These localities were located upon Lower Tpsc and Upper Tpy. More than 5,298 specimens were collected from these localities, which represent a deep water subtropical paleoenvironment close to shore with low relief (Reynolds 1989). Tpsc was represented by a coarsed grained light-grey arkosic sandstone and Tpy by light grey shale; the majority of the fossils were found in Tpy, but Tpsc accounted for a significant number as well. Taxa found at SBCM 1.116.12 – 1.116.17 include: Mollusca indet.; *Delectopecten* sp.; †*Lyropecten* sp.; Gastropoda indet.; Osteicthyes indet.; Clupeidae indet.; †*Ganolytes cameo*; †*Xyne grex*; *Argentina* sp.; Bathylagidae sp.; Stomiiformes indet.; *Cyclothone* sp.; *Argyropelecus* sp.; †*Chauliodus eximius*; cf. *Stomias* sp.; Myctophidae indet.; *Eclipes* sp.; cf. †*Lampris zatima*; Percichthyidae indet.; *Pseudoseriola* sp.; *Decapterus* sp.; *Seriola* sp.; *Rhythimias* sp.; *Lompoquia* sp.; Embiotocidae indet.; Scombridae indet.; cf. †*Thrysocles kriegeri*; Pleuronectiformes indet.; Cetacea indet.; Mysticeti indet.; *Delphinus* sp.; †*Chondrites ramulosa*; Plantae indet.; *Pinus* sp., cf. *P. coulteri*; *Sabal* sp.; *Smilacina* sp.; *Phragmites* sp.; *Bumelia* sp.; *Ribes* sp.; *Platanus* sp.; *Ficus* sp.; *Acer* sp.; *Populus* sp.; *Salix* sp.; *Alnus* sp.; *Cercis* sp.; *Robinia* sp.; *Sassafras* sp.; *Umbellularia* sp.; *Persea* sp.; *Quercus* sp., †*Q. convexa*; *Magnolia* sp.; Thallophyta indet.; †*Caulerpites denticulata*; †*Julescraneia grandicornis*; †*Paleohalidrys* sp., †*P. liguliformis*, †*P. linearis*, †*P. dendritica*, †*P. californica*, †*P. lompocensis*; †*Cystoseirites ornatus*; †*Paleocystophora* sp., †*P. acuminata*, †*P. plumosa*, †*P. lacerodentata*; †*Chondrides* sp., †*C. recurva*, †*C. flexis*; and Foraminifera indet. The preservation of articulated and relatively complete skeletons belonging to deep water mesopelagic fish indicates a calm, deep water environment with minimal outgoing transport. The presence of nearshore faunas and terrestrial flora is explained by incoming transport from shallower water, which is reflected in the slightly more damaged average condition of these specimens as opposed to the mesopelagic fishes (Reynolds 1989). A mass mortality layer of *Xyne grex* occurs over several localities, likely the result of a catastrophic oxygen depletion event according to Reynolds (1989). This mass mortality layer, the general high quality of preservation, and the presence of terrestrial plant fossil leaves suggests an anoxic seabed, which prevented scavenging and decomposition. Reynolds (1989) contains a more fully detailed account of these sites and associated mitigation work, beyond the parameters of this report.

The records discussed above cover nearly all of the fossil localities found within the northern half of the City of Chino Hills. An exception is localities SBCM 1.116.337 and 1.116.338, found in Grand Avenue Park within Yorba Linda Quadrangle. Fossils were found in two units of

light-olive grey shale pertaining to Tpy, one dry and the other wet. The dry shale produced disarticulated and isolated elements of teleost fish, while the wet shale produced unidentifiable dicot impressions. However, southeastern sections of the City of Chino Hills, including the area around Chino Hills State Park, Prado Dam, the Butterfield Ranch and Hunter's Hill subdivisions, and numerous canyons along the east face of the Puente Hills are notably fossiliferous. Two isolated localities occur in Chino Hills State Park. SBCM 1.116.269 is located west of Bane Canyon Road and north of Rolling M Ranch Campground, between Upper Aliso Trail and Upper Bane Ridge Trail Lookout. Cetacean fossils were recovered here from Tpy. Another whale was discovered at SBCM 1.116.270, Mcdermont Spring. Several localities occur along Slaughter Canyon and Abacherli Canyon east of the park's borders. SBCM 1.116.11 is near the head of Slaughter Canyon Trail, while 1.116.12 – 1.116.14 lie closer to the Butterfield Ranch subdivision. These localities belong to Tpsc and taxa found therein include: Bivalvia indet.; Osteichthyes indet.; Plantae indet.; and Pinopsida indet.

Not far from the Slaughter Canyon localities, multiple SBCM localities were identified during the construction of the Butterfield Ranch and Hunter's Hill subdivisions located between Highway 71 and Chino Hills State Park. SBCM 1.116.241 – 244 were identified at Butterfield Ranch, within sediments corresponding to Tpsc found on a ridge between Abacherli Canyon and Slaughter Canyon. Taxa found at these localities include: Bivalvia indet; *Donax* sp.; *Macoma* sp.; *Cyclocardia* sp.; *Thracia* sp.; †*Clementia compsoyax*; *Nassarius* sp.; Myctophidae inde.; Plantae indet.; *Plantanus* sp.; *Salix* sp.; †*Persea coalingensis*; and *Quercus* sp. These sites differ from many other Puente Hills Formation localities by the relative lack of mesopelagic fishes, or many fish fossils at all. SBCM 1.116.244 produced several myctophid fossils, but the other localities contain mostly bivalves, including taxa that tend to prefer shallower waters. Of particular note is *Donax*, which dwells infaunally on beaches and sometimes the intertidal zone. It is possible that that the shallow water bivalves were all transported to deep water typical of the Puente Formation, given the presence of Myctophidae, but it is also possible that some of these localities reflect a shallower depositional environment. Note that these localities are closer to Owl Rock Quarry (see below) than most other localities from the Puente Hills, which is widely regarded to be a near-shore deposit in Tpsc. SBCM 1.116.271 – 274 were found during surveying of road cuts preceding the construction of Hunter's Hill, in light to buff clayey silts corresponding to Tpsc. These localities produced fossils of significantly poorer condition than Butterfield Ranch, with most specimens unable to be identified beyond coarse taxonomy. Indeterminate Bivalvia, Osteichthyes, and Plantae were recovered from these localities.

Owl Rock Quarry, situated northwest of the intersection between Highway 71 and Highway 91, contains 35 fossil localities: SBCM 1.116.16 – 1.116.23 and SBCM 1.116.180 – 1.116.206. These localities are found throughout both the active quarry and the hills surrounding

it. Sediments here correlate to Upper Tpsc, ranging from gray to yellow-green silty micaceous and carbonaceous sandstone to a stark white sandstone sometimes containing localized conglomerate. Fossils were much more commonly found in the greenish finer grained strata. Taxa found at these localities include: Bivalvia indet.; *Ostrea* sp.; *Thyasira* sp.; Chordata indet.; Chondrichthyes indet.; *Carcharhinus* sp.; Plantae indet; and Fagales indet. The paleoenvironment is hypothesized to be near-shore in relatively shallow water (neritic zone), as compared to the deep water depositional environments common in the Puente Formation further north and west (Durham and Yerkes 1964; Reynolds 1984, 1989; Dibblee and Ehrenspeck 2001). A calm and low gradient freshwater source likely provided the diverse fossil flora of Owl Rock Quarry, which includes tree leaves, wood, and reeds, though aeolian transport is also possible (Reynolds 1984).

The City of Chino Hills exists within a broader geological and paleontological context that includes the adjacent modern San Bernardino Valley, Santa Ana Mountains, and Los Angeles Basin. To the east, Qoa rapidly thickens to several hundred feet of depth in the San Bernardino Valley, with occasional hilly outcrops of Mesozoic igneous basement rock and a possible eastern extension of the Pliocene age Fernando Formation in Norco. The Qoa in this region is richly fossiliferous with Irvingtonian and Rancholabrean mega- and microfauna, yielding the remains of mastodons, mammoths, *Smilodon*, camels, horses, bison, ground sloths, lagomorphs, rodents, and eulipotyphlans (Reynolds and Reynolds 1991). Examples of such Pleistocene age sites within 5 miles of the City of Chino Hills include SBCM 5.5.48 – 5.5.58 and 1.116.275 – 1.116.288. Taxa found at these localities can be considered potentially representative of similarly aged Qoa found within the City of Chino Hills.

The Santa Ana Mountains to the south contain multiple SBCM localities within 5 miles of the jurisdictional area of the City of Chino Hills. SBCM 5.5.4 – 5.5.6 occur within marine shales interrupted by coal and terrestrial clay deposits, all belonging to the late Cretaceous Ladd Formation. Terrestrial units yield plant fossils including leaves, needles, and water reeds. Taxa from the marine strata include: Bivalvia indet.; cf. *Propeamussium* sp.; cf. *Ostrea* sp.; †*Inoceramus* sp.; †*Scaphites* sp.; Plantae indet.; Araucaria sp.; and indeterminate algae. SBCM 5.5.7 – 5.5.11 occur within the Paleocene Silverado Formation, which is of deep marine origin with transported terrestrial plant fossils. Taxa found in these localities include: Bivalvia indet.; †*Cucullaea* cf. *matthewsonii*; Crassatella sp.; †*Glycymeris* cf. *veatchii* var. *major*; Gastropoda indet.; cf. †*Brachysphingus* sp.; †*Ficopsis* sp.; †*Turritella* cf. pachecoensis; Plantae indet.; Cycadeoidae indet.; Gymnospermae indet.; Angiospermae indet.; and indeterminate reeds fossils. A full account of the paleontology of the northern Santa Ana Mountains is beyond the scope of this report. Schoellhamer et al. (1981) provides a general overview of the region. Overall, the Santa Ana Mountains contain a mixture of the same units found in the Puente Hills, but also expose older units underlying those present at and near the surface of the Puente Hills.

Three SBCM localities are present at Diamond Bar, located roughly 2.5 miles west of SBCM 1.116.337 and 1.116.338. Localities SBCM 1.116.5, 1.116.9, and 1.116.10 are situated in unidentified members of the Puente Formation. SBCM 1.116.5 preserves cetacean bone fragments within a conglomeritic sandstone. SBCM 1.116.9 preserves articulated and nearly complete fish skeletons in light grey shale, indicating it comes from the deep water paleoenvironment typical of fossiliferous Puente Formation units. Finally, SBCM 1.116.10 produced a cetacean vertebra from an undescribed sandstone.

This records search covers only the paleontological records of the San Bernardino County Museum. It is not intended to be a thorough paleontological survey of the proposed project area covering other institutional records, a literature survey, or any potential on-site survey.

Please do not hesitate to contact us with any further questions that you may have.

Sincerely,

Scott Kottkamp

Scott Kottkamp, Curator of Earth Science
Division of Earth Science
San Bernardino County Museum

Literature Cited

Dibblee, T.W., and H.E. Ehrenspeck. 2001. Geologic map of Yorba Linda and Prado Dam quadrangles (eastern Puente Hills), Los Angeles, Orange, San Bernardino and Riverside Counties, California. Dibblee Geological Foundation. Dibblee Foundation Map DF-75. Scale 1:24,000.
Available at: https://ngmdb.usgs.gov/Prodesc/proddesc_71710.htm (accessed 20 April 2022).

Dibblee, T.W., and J.A. Minch. 2002. Geologic map of the San Dimas and Ontario quadrangles, Los Angeles and San Bernardino Counties, California. Dibblee Geological Foundation. Dibblee Foundation Map DF-91. Scale 1:24,000.
Available at: https://ngmdb.usgs.gov/Prodesc/proddesc_71723.htm (accessed 26 July 2022).

Durham, D.L., and R.F. Yerkes. 1964. Geology and oil resources of the eastern Puente Hills area, southern California, *in* Geology of the eastern Los Angeles basin, southern California. U.S. Geological Survey. Professional Paper 420-B. Scale 1:24,00.
Available at: https://ngmdb.usgs.gov/Prodesc/proddesc_260.htm (accessed 26 July 2022).

Morton, D.M., C.H. Gray, K.R. Bovard, and M. Dawson. 2002. Geologic map of the Corona North 7.5' quadrangle, Riverside and San Bernardino Counties, California. U.S. Geological Survey. Open-File Report OF-2002-22. Scale 1:24,000. Available at:
https://ngmdb.usgs.gov/Prodesc/proddesc_46492.htm (accessed 19 April 2022).

Morton, D.M., and F.K. Miller. 2006. Geologic map of the San Bernardino and Santa Ana 30' x 60' quadrangles, California. U.S. Geological Survey. Open-File Report OF-2006-1217. Scale 1:100,000.
Available at: https://ngmdb.usgs.gov/Prodesc/proddesc_78686.htm (accessed 19 April 2022).

Reynolds, R.E. 1984. Paleontologic assessment, Trautwein Annexation No. 54, southeastern Puente Hills and northern Santa Ana Mountains, Riverside County, California. San Bernardino County Museum. Redlands, CA.

Reynolds, R.E. 1989. Paleontologic Salvage Soquel Canyon Project AD-85, Chino Hills, San Bernardino County, California. San Bernardino County Museum. Redlands, CA. 122 p.

Reynolds, R. E., and R.L. Reynolds. 1991. The Pleistocene Beneath our Feet: Near-surface Pleistocene Fossils from Inland Southern California Basins. San Bernardino County Museum Association Quarterly 38(3 & 4): 41-43.

Reynolds R.E., J. Reynolds, M.A. Roeder, and R.W. Huddleston. 1985. Paleontologic salvage, Robert O. Townsend Junior High School site, Chino, San Bernardino County, California. San Bernardino County Museum. Redlands, CA. 273 p.

Schoellhamer, J.E., J.G. Vedder, R.F. Yerkes, and D.M. Kinney. 1981. Geology of the Northern Santa Ana Mountains, California. U.S. Geological Survey. Professional Paper 420-D. US Printing Office, Washington D.C.
Available at: https://pubs.usgs.gov/pp/0420d/report.pdf (accessed 28 July 2022).

Scott, E. 1998. Paleontologic Resource Mitigation Program San Bernardino County Segment, Chino Valley Freeway (State Route 71) Realignment/Expansion, San Bernardino County, California. San Bernardino County Museum. Redlands, CA. 114 p.

Scott, E. 1999. Paleontological Resource Mitigation Program Carbon Canyon Creek Channelization, City of Chino, San Bernardino County, California. San Bernardino County Museum. Redlands, CA. 57 p.

APPENDIX B

Natural History Museum of Los Angeles County
Paleontological Records Search

CONFIDENTIAL – NOT FOR PUBLIC RELEASE

Natural History Museum
of Los Angeles County
900 Exposition Boulevard
Los Angeles, CA 90007

tel 213.763.DINO
www.nhm.org

Research & Collections

e-mail: paleorecords@nhm.org

June 19, 2022

SWCA Environmental Consultants
Attn: Georgia Knauss

re: Paleontological resources for the City of Chino Hills Plan Update Project #00066884

Dear Georgia:

I have conducted a thorough search of our paleontology collection records for the locality and specimen data for proposed development at the City of Chino Hills Plan Update project area as outlined on the portion of the e San Dimas, Ontario, Prado Dam, Yorba Linda, Black Star Canyon USGS topographic quadrangle map that you sent to me via e-mail on June 1, 2022. We have numerous fossil localities that lie directly within the proposed project area, particularly invertebrate sites in the southwestern project area.

The following table shows the known localities in the collection of the Natural History Museum of Los Angeles County (NHMLA) from the project area shapefiles provided on June 13, 2022.

Locality Number	Location	Formation	Taxa	Depth
LACM VP 1728	W of intersection of English Rd & Peyton Dr, Chino	Unknown (light brown shale with interbeds of very coarse brown sand; Pleistocene)	Horse (*Equus*), camel (*Camelops*)	15-20 feet bgs
LACM VP 7508	Near intersection of Vellano Club Dr. and Palmero Dr., Oakcrest Development; N of Serrano Canyon, Chino Hills	Unknown formation (Pleistocene)	Ground sloth (*Nothrotheriops*); elephant family (Proboscidea); horse (*Equus*)	Unknown
LACM VP 7268, 7271	Sundance Condominiums, S of Los Serranos Golf Course	Unknown (Pleistocene)	Horse (*Equus*)	Unknown

VP, Vertebrate Paleontology; IP, Invertebrate Paleontology; bgs, below ground surface

Additional localities from the vicinity are as follows:

Locality	Location	Formation	Taxa	Depth

Number				
LACM IP 17597-17600	Olinda landfill	Puente Formation	Invertebrates, including the shelled octopod (Mizuhobaris lepta)	Unknown
LACM IP 17925-17928, 17932	West end of the San Jose Hills, around intersection of N Azusa Ave and E Amar Rd.	Sycamore Canyon Formation (Sandstone and conglomerate facies)	Bivalves (Tellinidae, Delectopecten), Gastropods (Fasciolaridae); Land plants (Taxodium dubium, Typha lesquereuxi, Phragmites)	6-6.5 feet bgs
LACM VP 7930-7932	Five Knolls development, Golden Valley Rd., Santa Clarita	Monterey Formation (Yorba Shale; sandstone & diatomaceous shale)	Bony fish (Osteichthyes), including ray-finned fishes (Clupeidae)	6.5 - 7 feet bgs
LACM VP 6166, 6167, 6172, 6173, 7471	Puddingstone Reservoir, San Jose Hills	Puente Formation	Sturgeonfish (*Prionurus*), Mako shark (*Isurus planus),* Extinct bony fish (*Etringus*), Mola (Molidae), other Fish (Osteichthyes)	Surface

VP, Vertebrate Paleontology; IP, Invertebrate Paleontology; bgs, below ground surface

This records search covers only the records of the NHMLA. It is not intended as a paleontological assessment of the project area for the purposes of CEQA or NEPA. Potentially fossil-bearing units are present in the project area, either at the surface or in the subsurface. As such, NHMLA recommends that a full paleontological assessment of the project area be conducted by a paleontologist meeting Bureau of Land Management or Society of Vertebrate Paleontology standards.

Sincerely,



Alyssa Bell, Ph.D.
Natural History Museum of Los Angeles County

enclosure: invoice

APPENDIX C

RHNA Sites – Geologic Maps

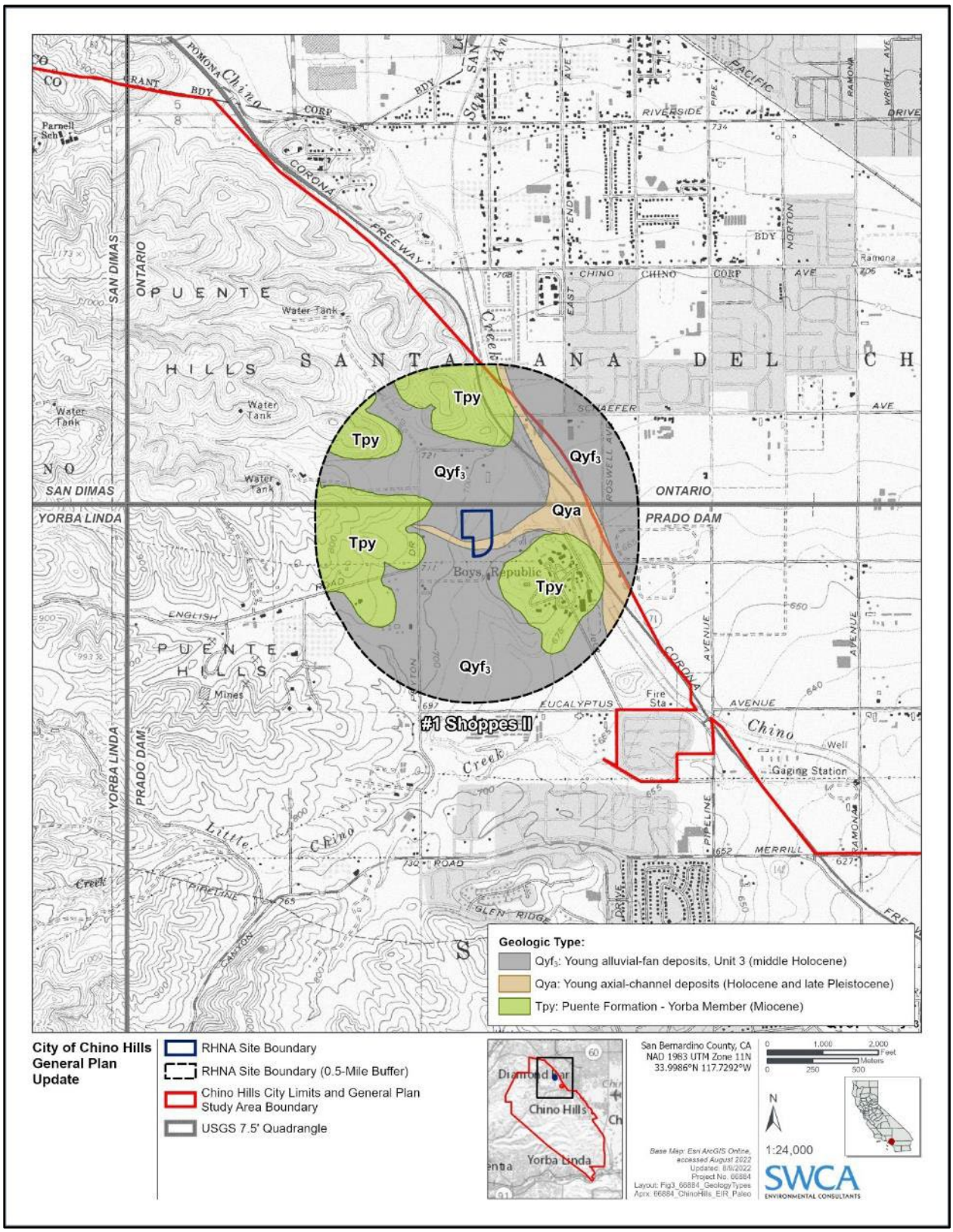


Figure C-1. Geologic map of the RHNA Site 1 The Shoppes II.

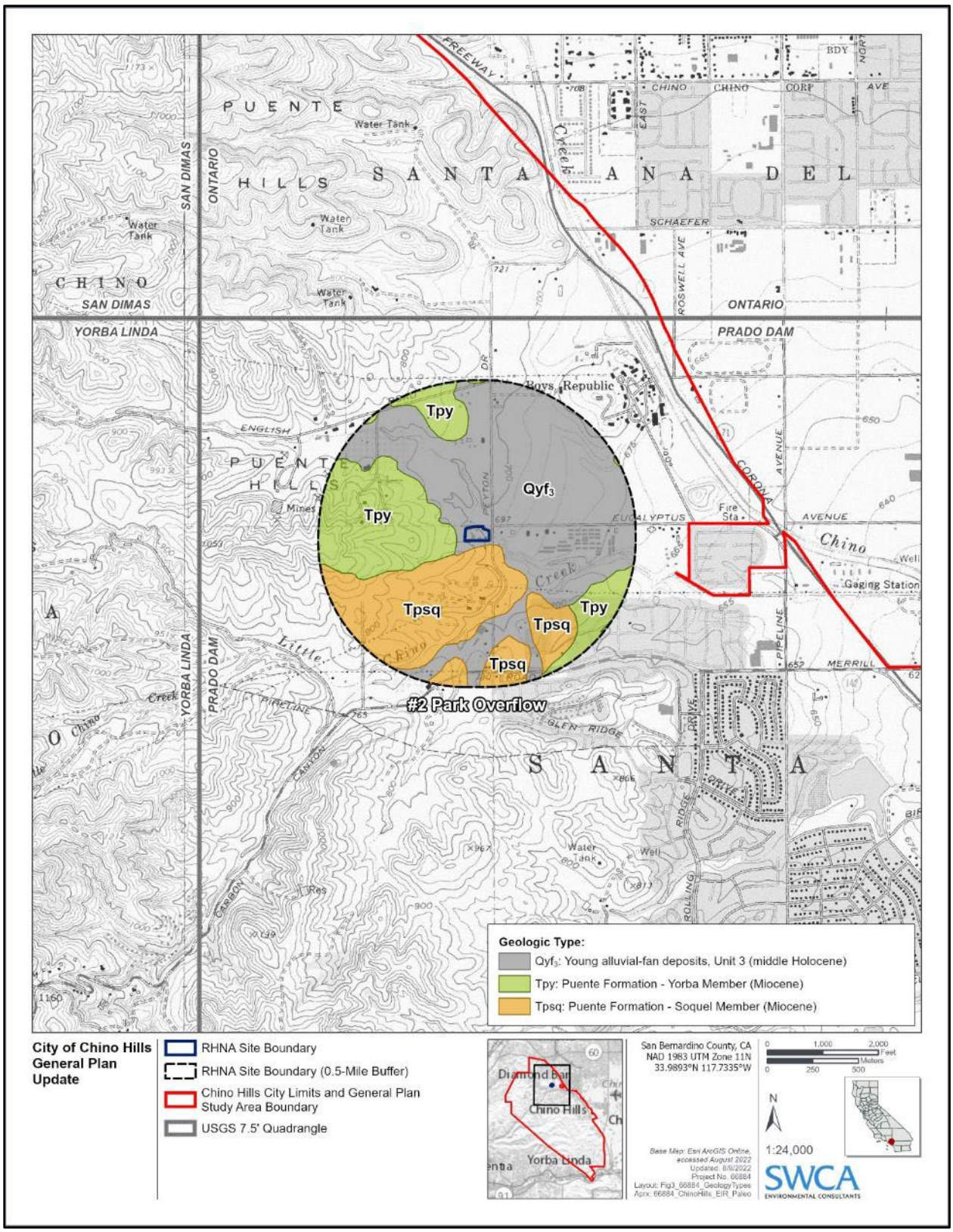


Figure C-2. Geologic map of the RHNA Site 2 Community Park Overflow.

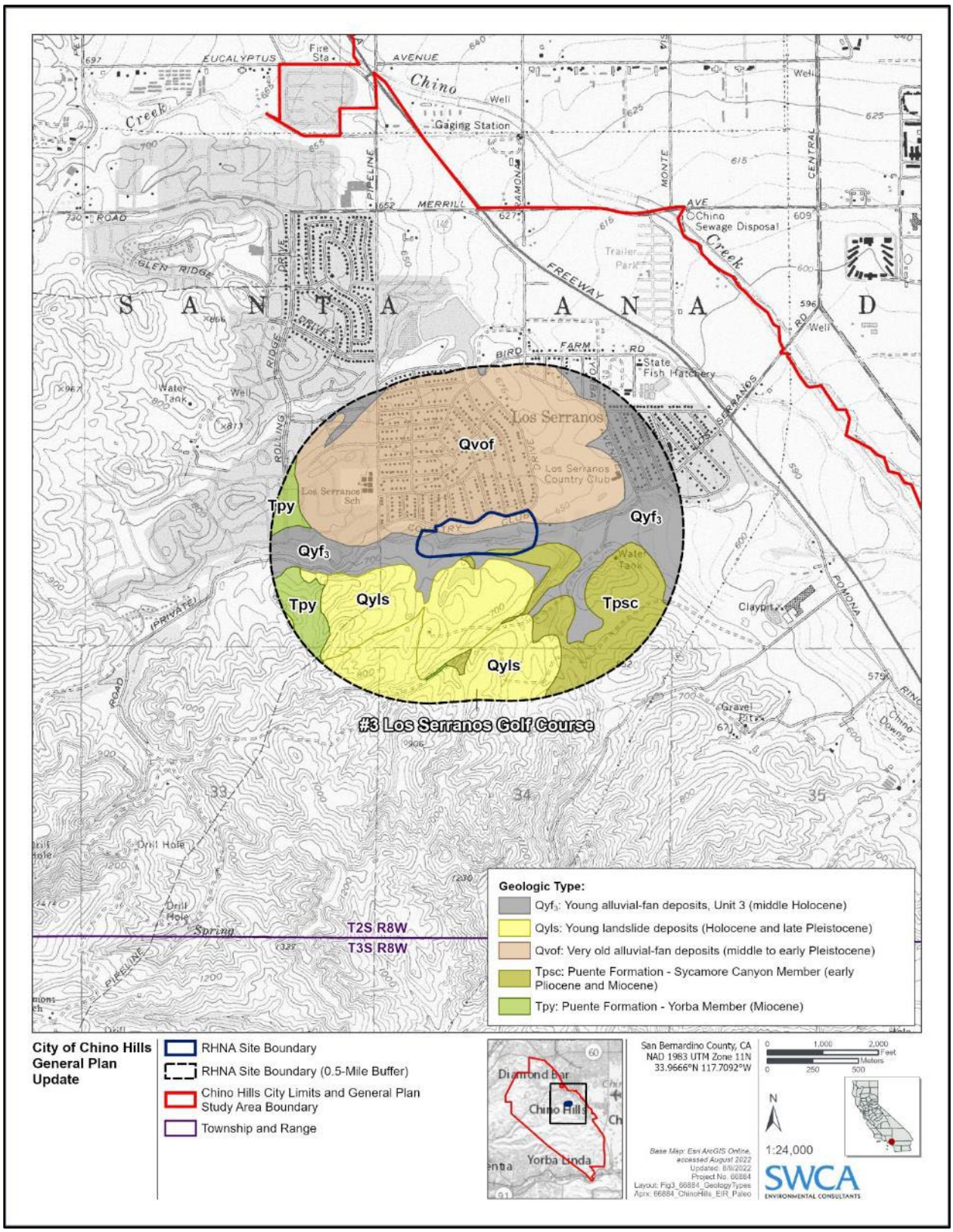


Figure C-3. Geologic map of the RHNA Site 3 Los Serranos Golf Course.

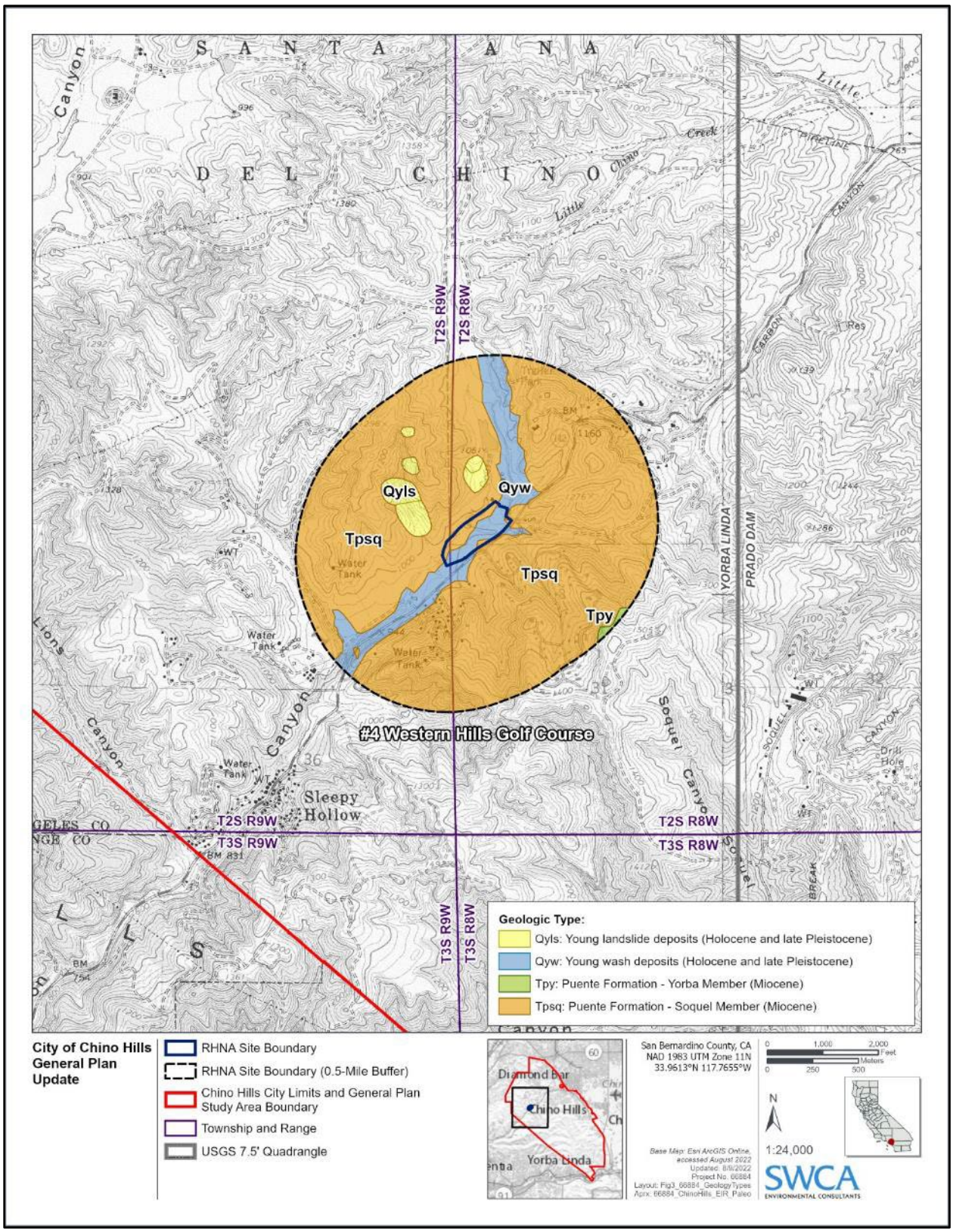


Figure C-4. Geologic map of the RHNA Site 4 Western Hills Golf Course.

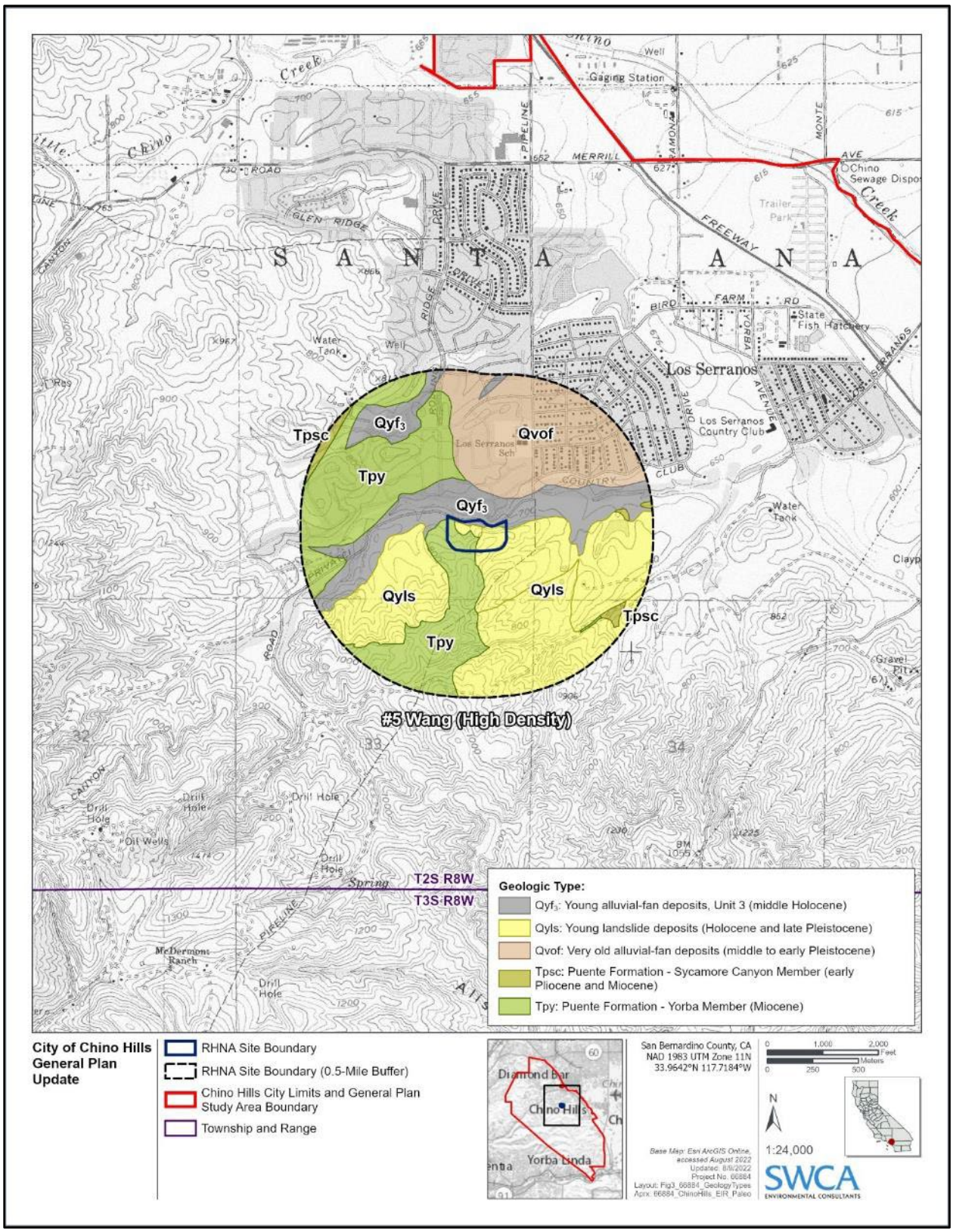


Figure C-5. Geologic map of the RHNA Site 5 Wang (High Density).

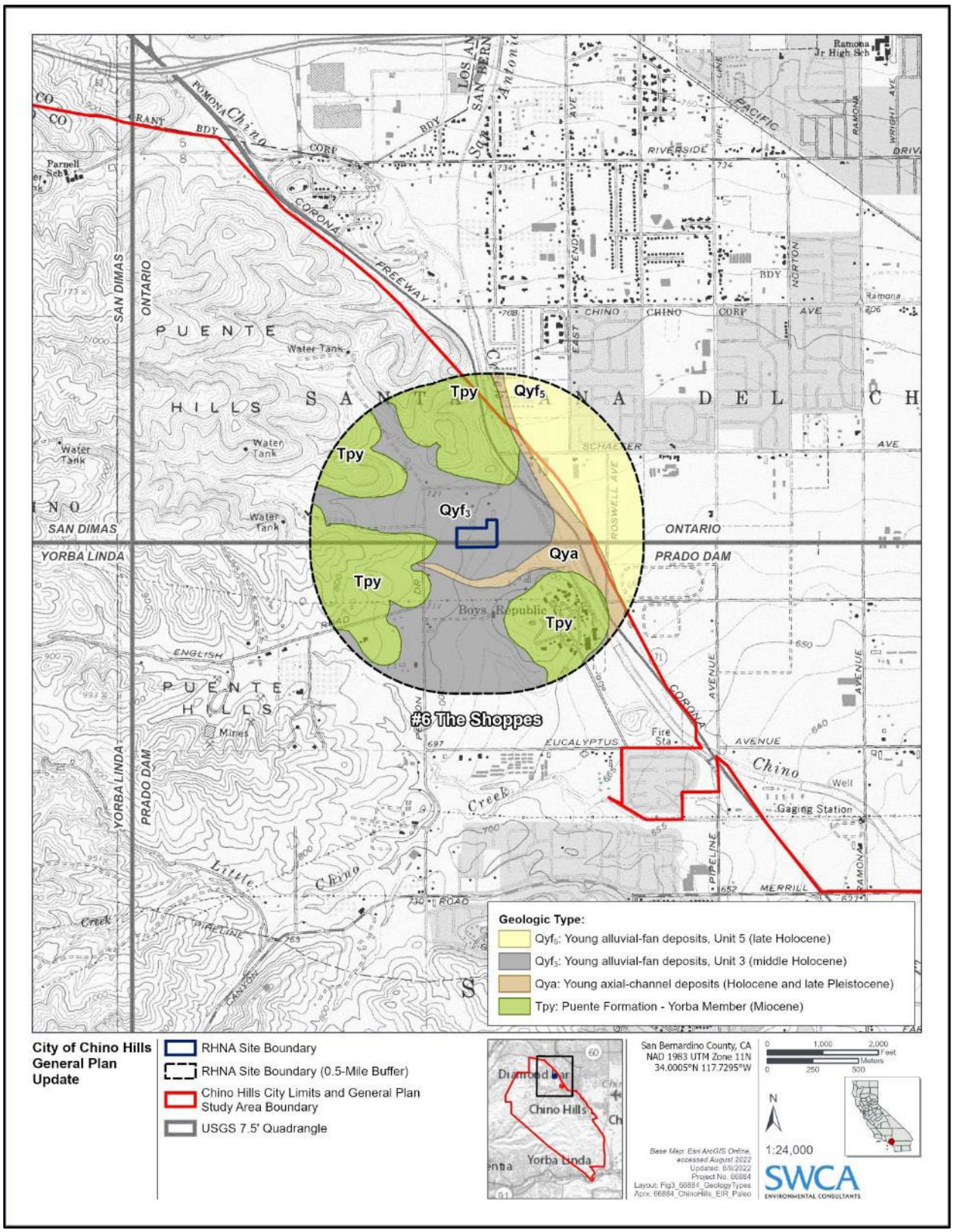


Figure C-6. Geologic map of the RHNA Site 6 The Shoppes.

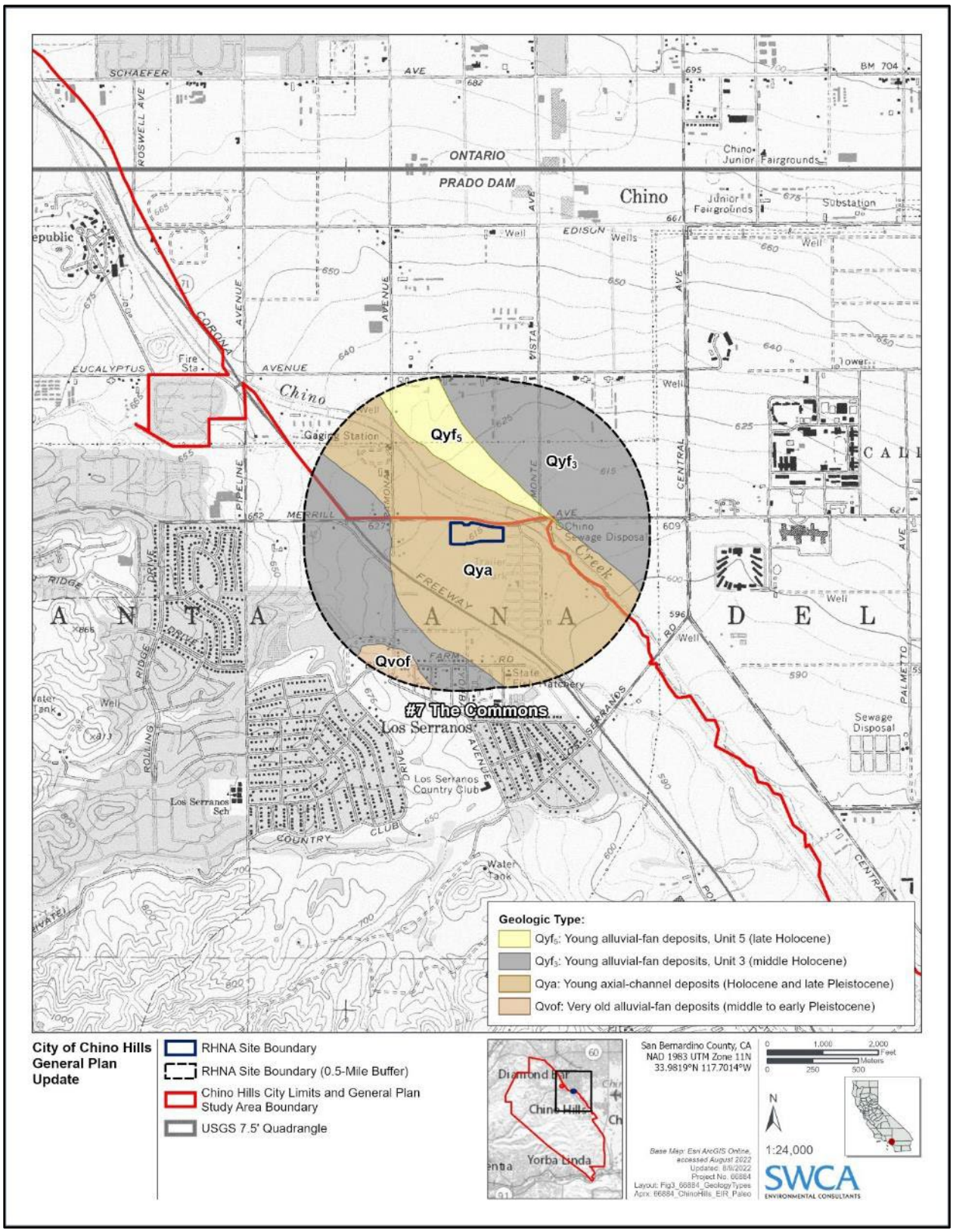


Figure C-7. Geologic map of the RHNA Site 7 The Commons.

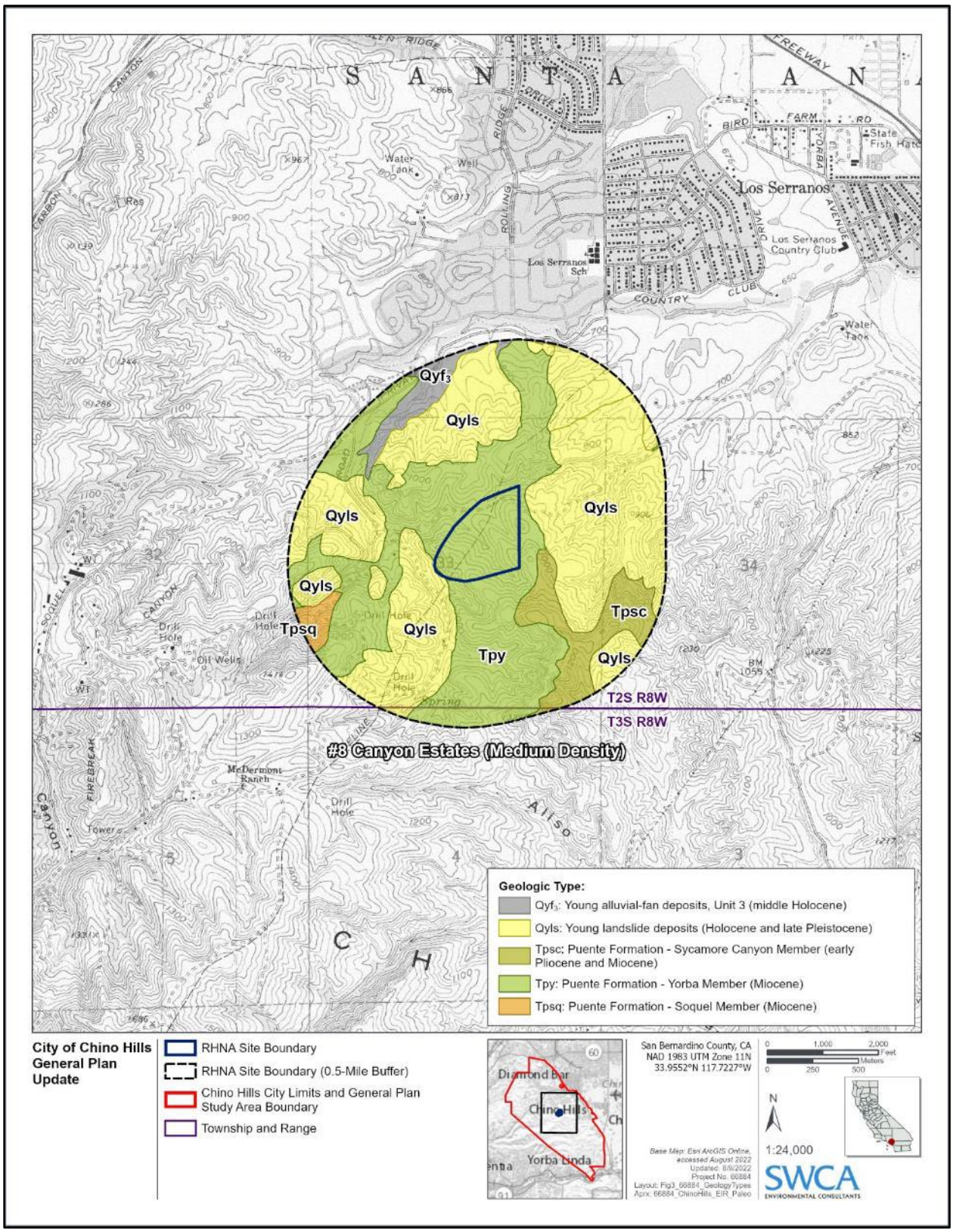


Figure C-8. Geologic map of the RHNA Site 8 Canyon Estates (Medium Density).

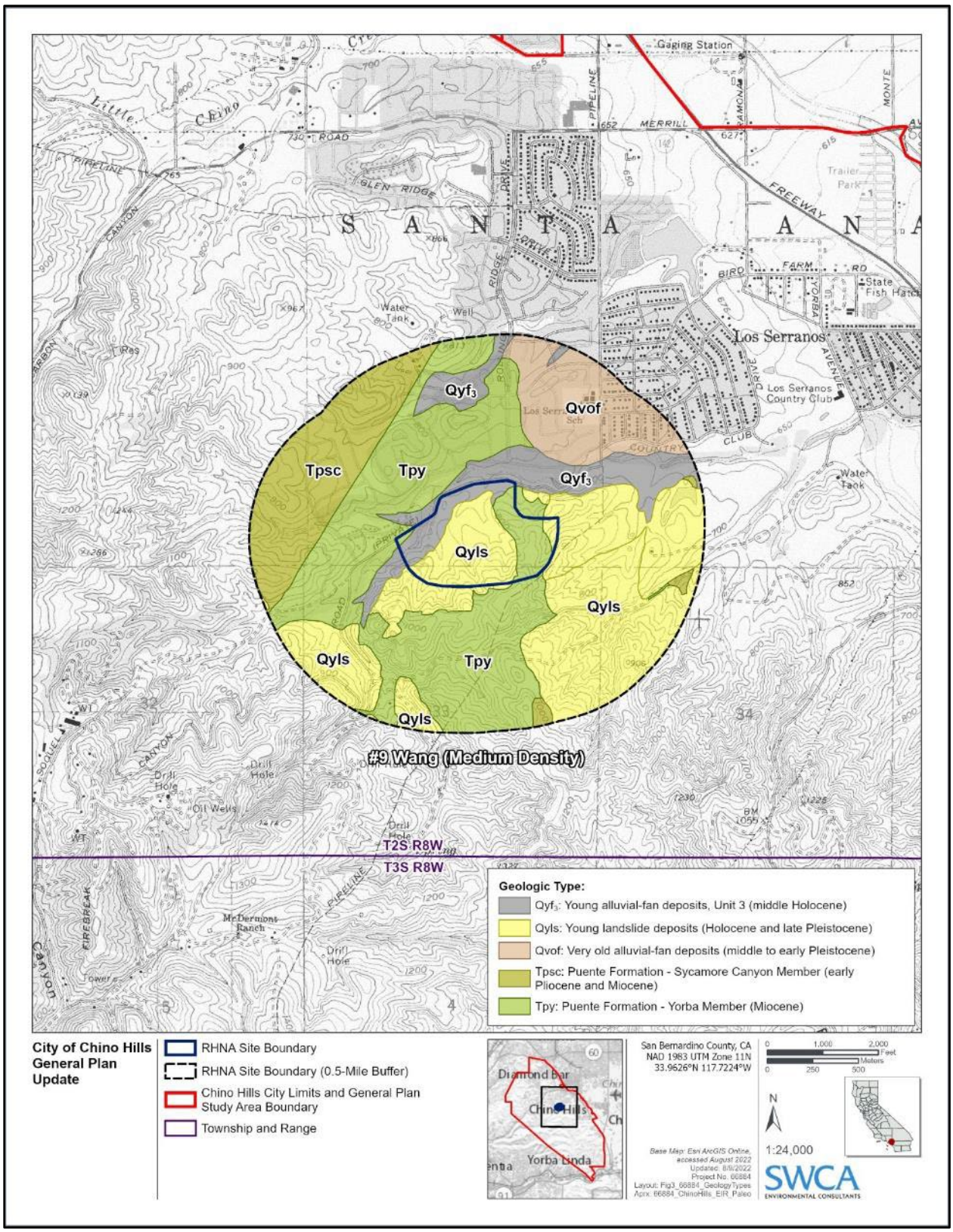


Figure C-9. Geologic map of the RHNA Site 9 Wang (Medium Density).

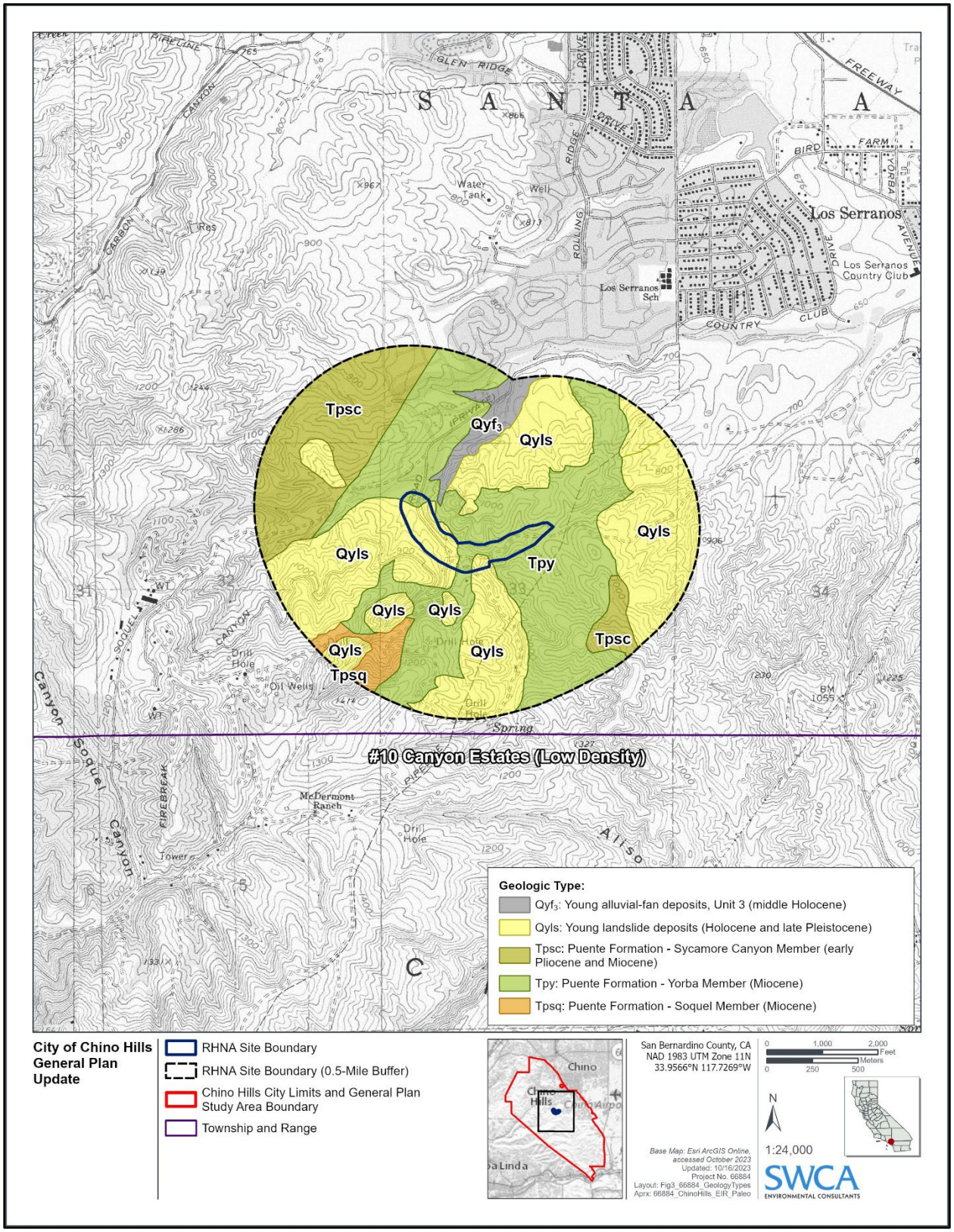


Figure C-10. Geologic map of the RHNA Site 10 Canyon Estates (Low Density).

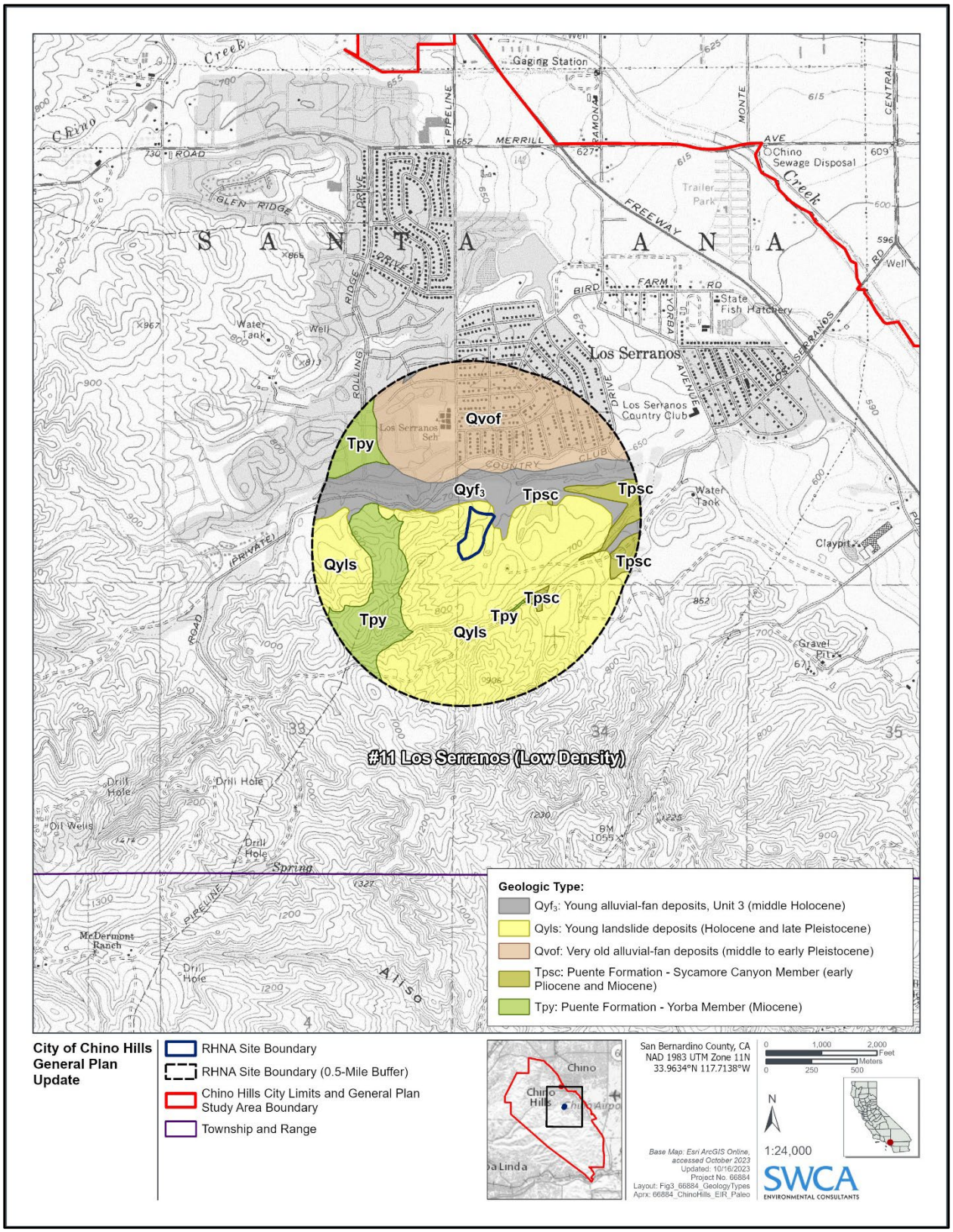


Figure C-11. Geologic map of the RHNA Site 11 Los Serranos (Low Density).

APPENDIX D

RHNA Sites – Paleontological Sensitivity Maps

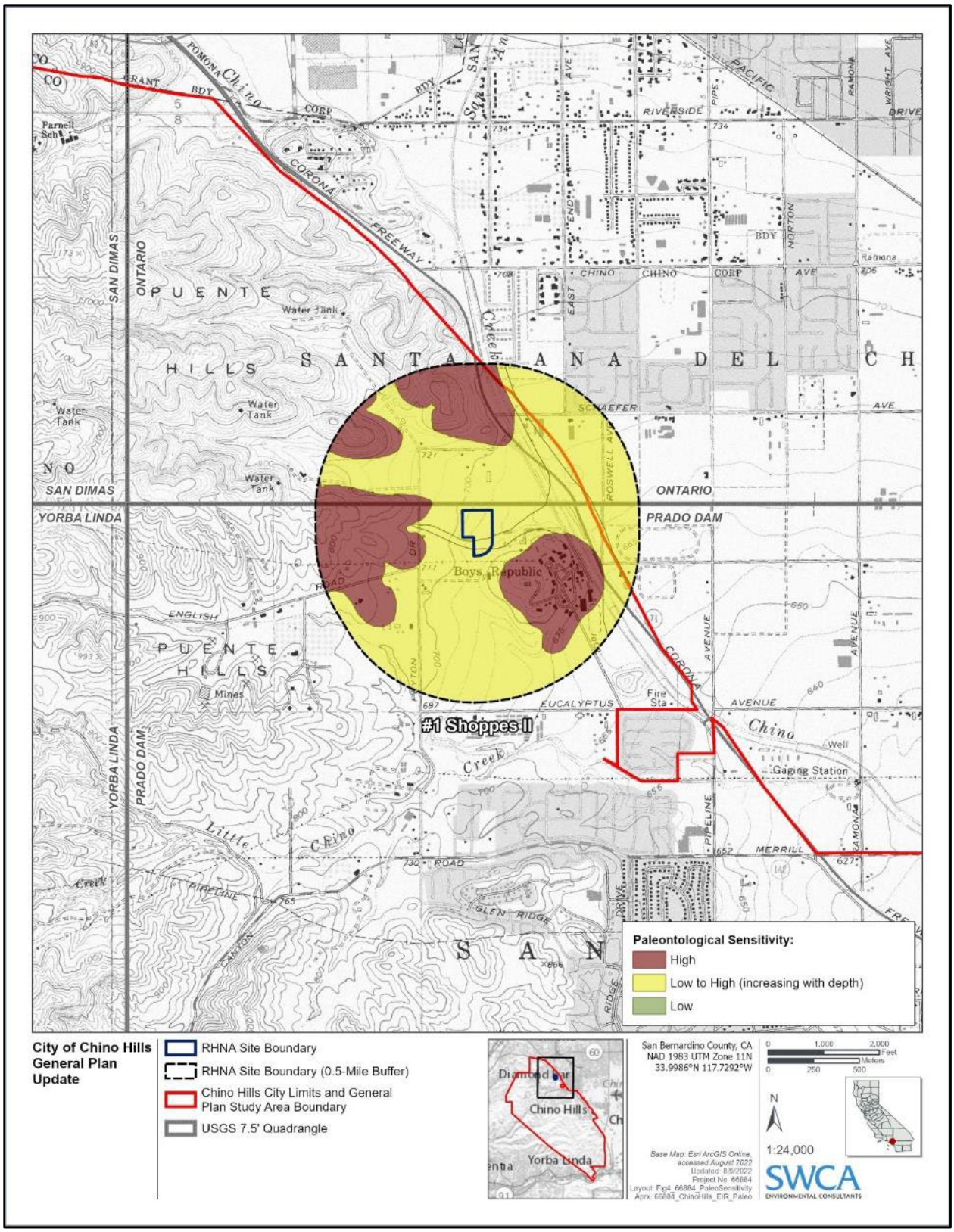


Figure D-1. Paleontological sensitivity map of the RHNA Site 1 The Shoppes II.

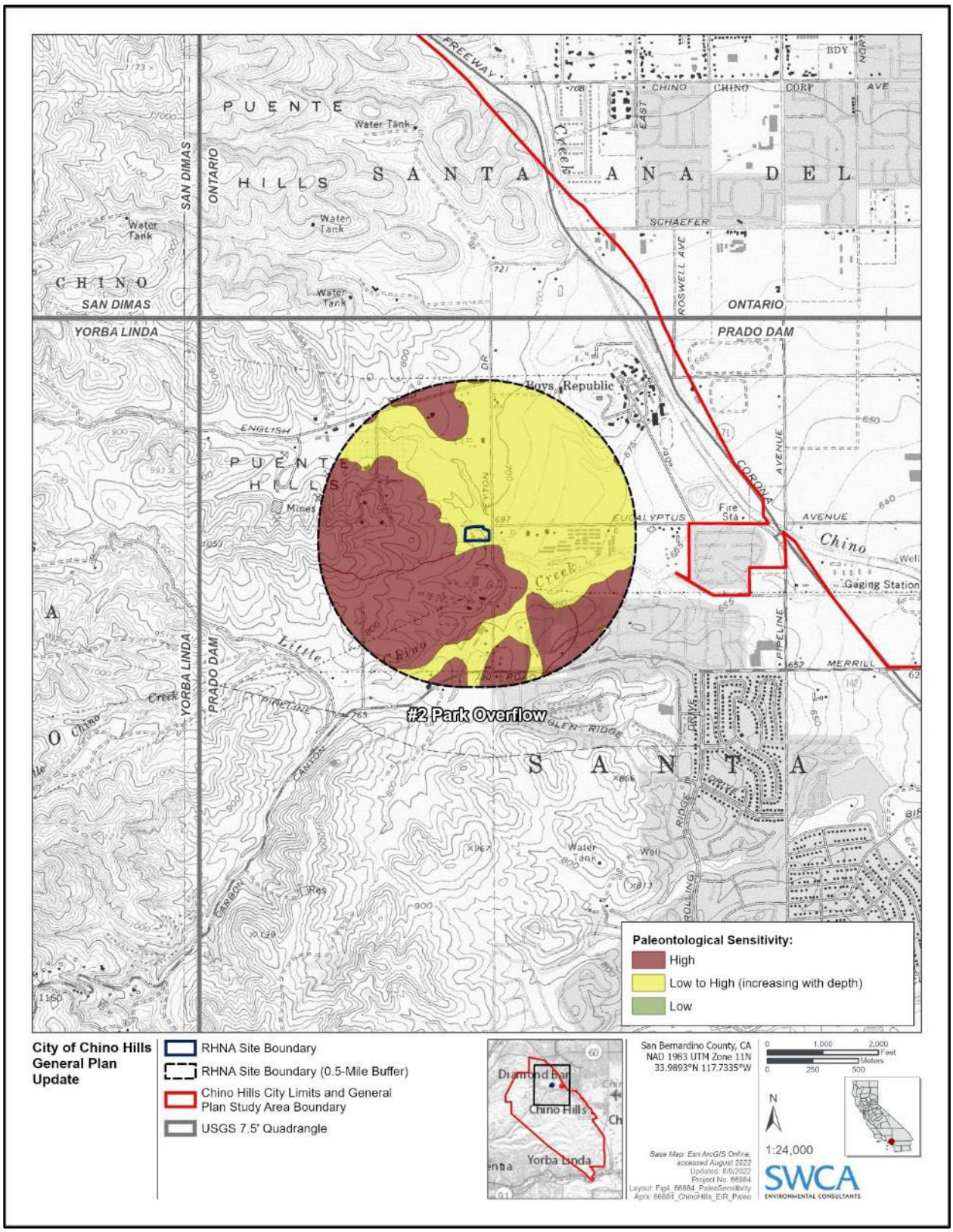


Figure D-2. Paleontological sensitivity map of the RHNA Site 2 Community Park Overflow.

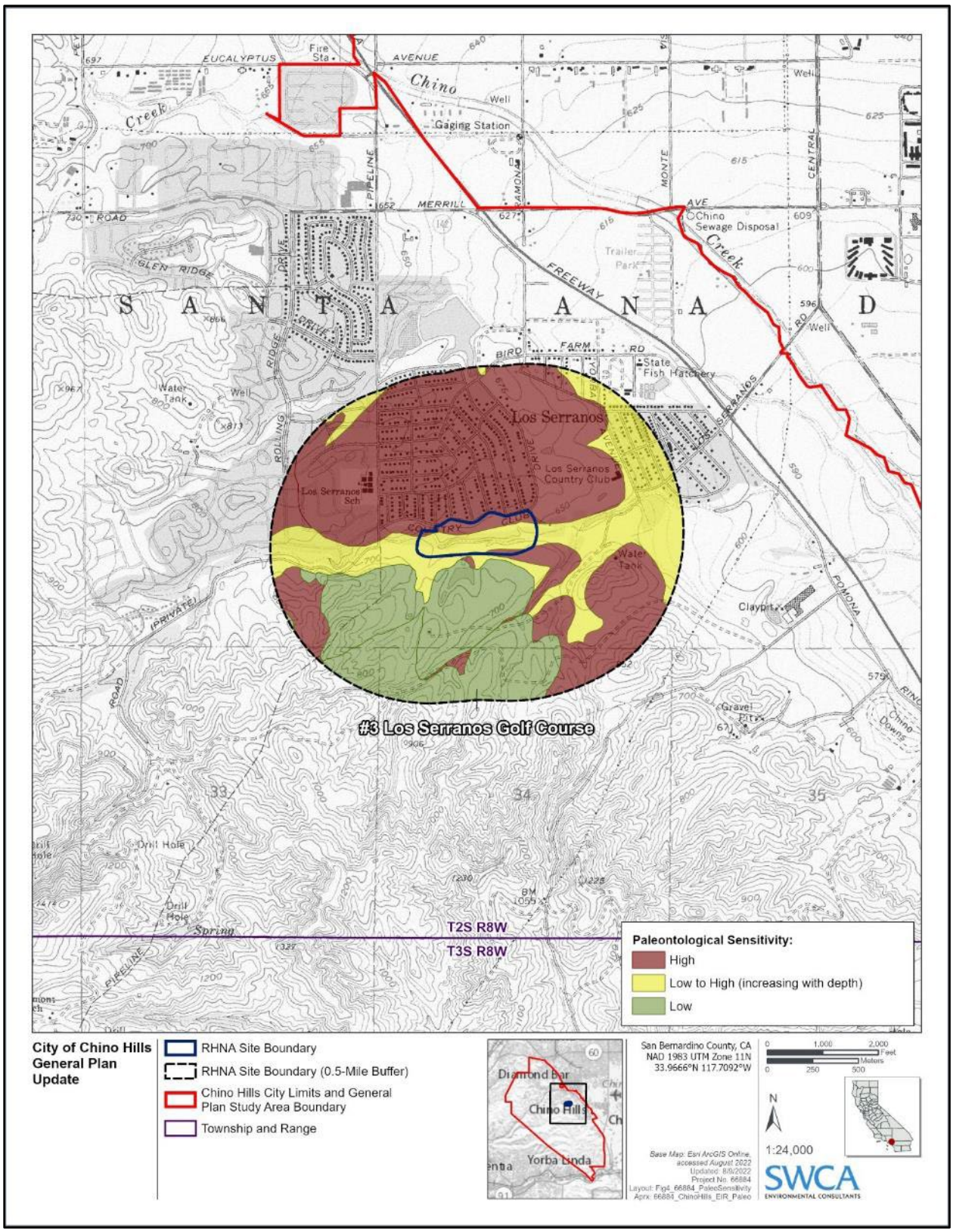


Figure D-3. Paleontological sensitivity map of the RHNA Site 3 Los Serranos Golf Course.

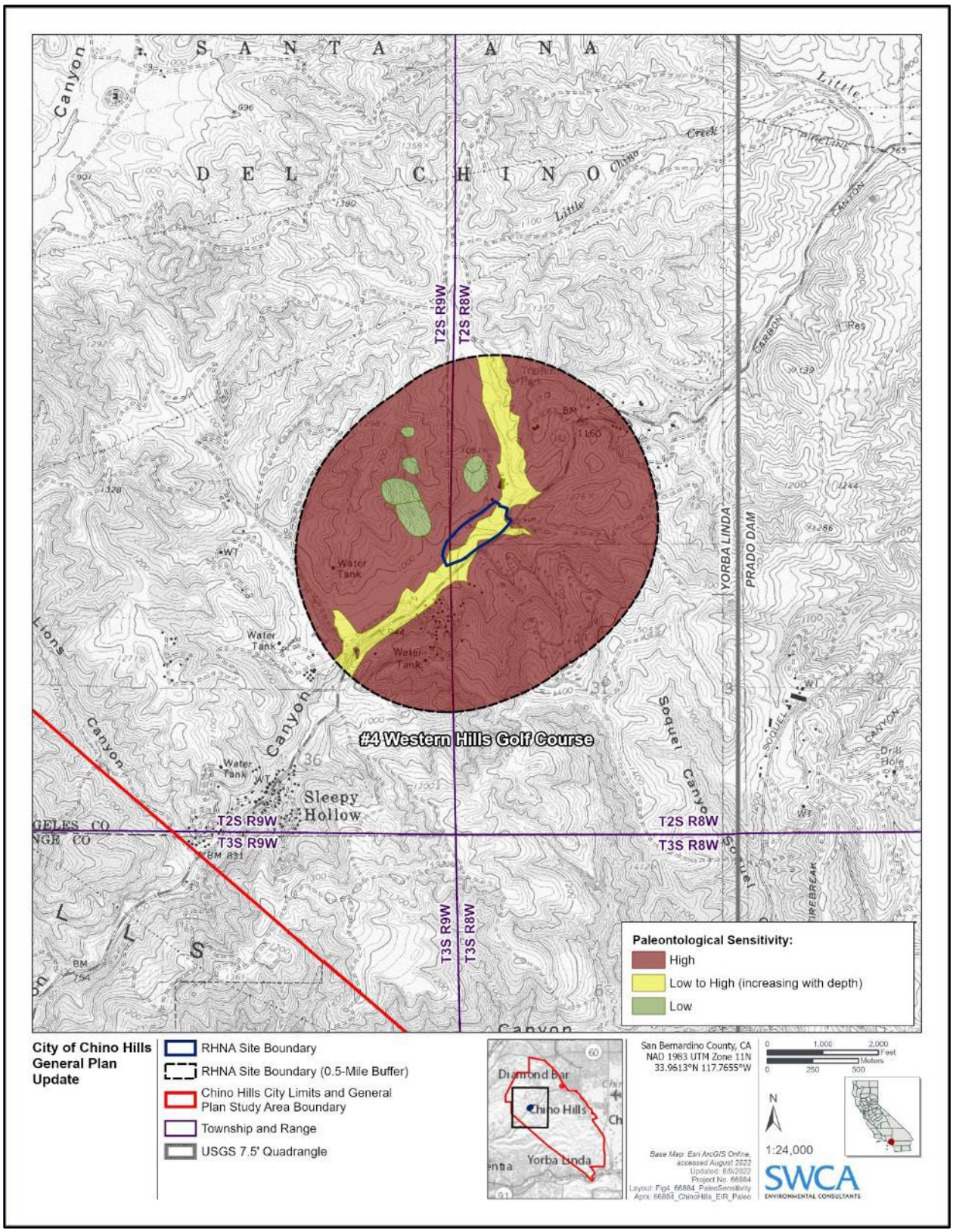


Figure D-4. Paleontological sensitivity map of the RHNA Site 4 Western Hills Golf Course.

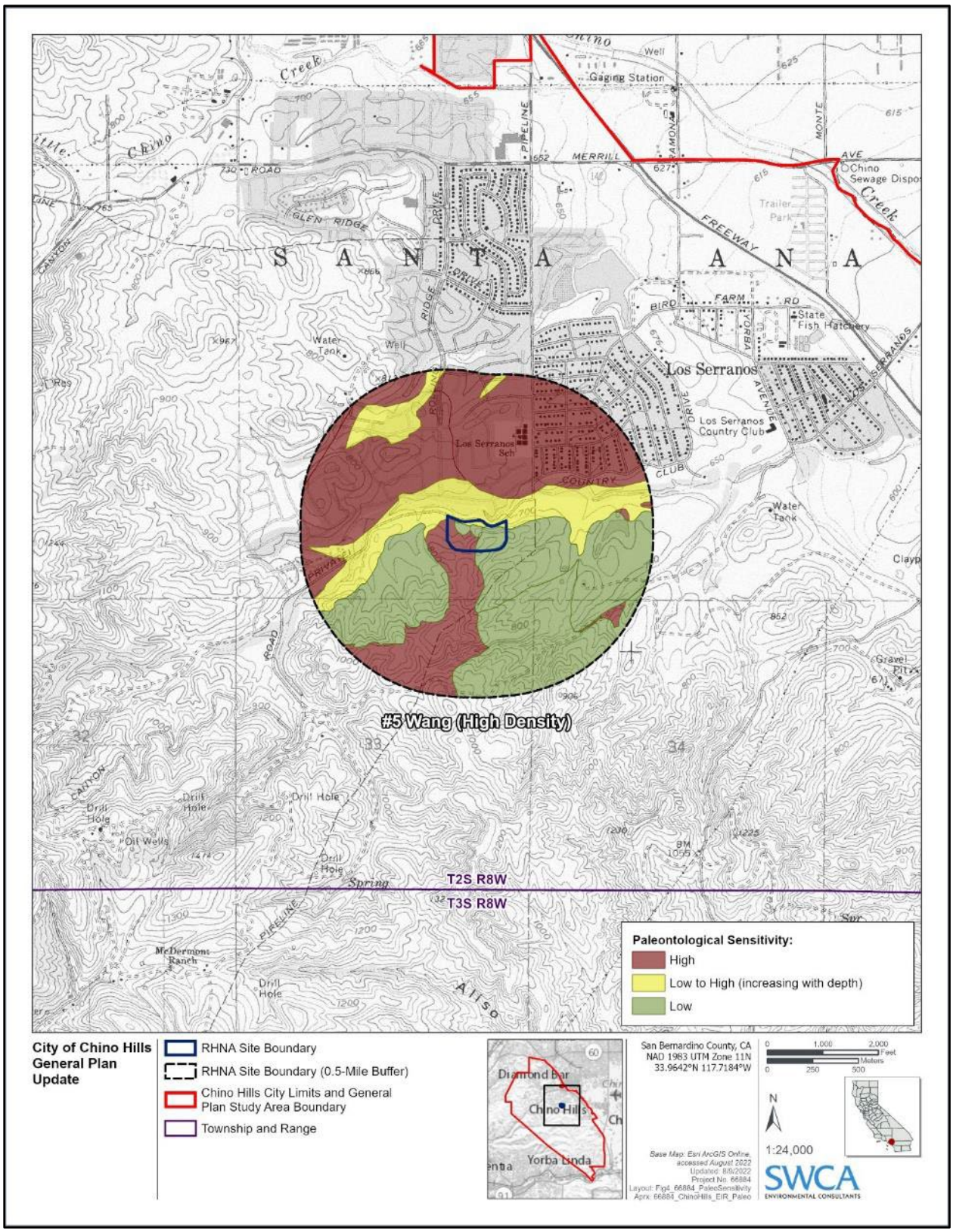


Figure D-5. Paleontological sensitivity map of the RHNA Site 5 Wang (High Density).

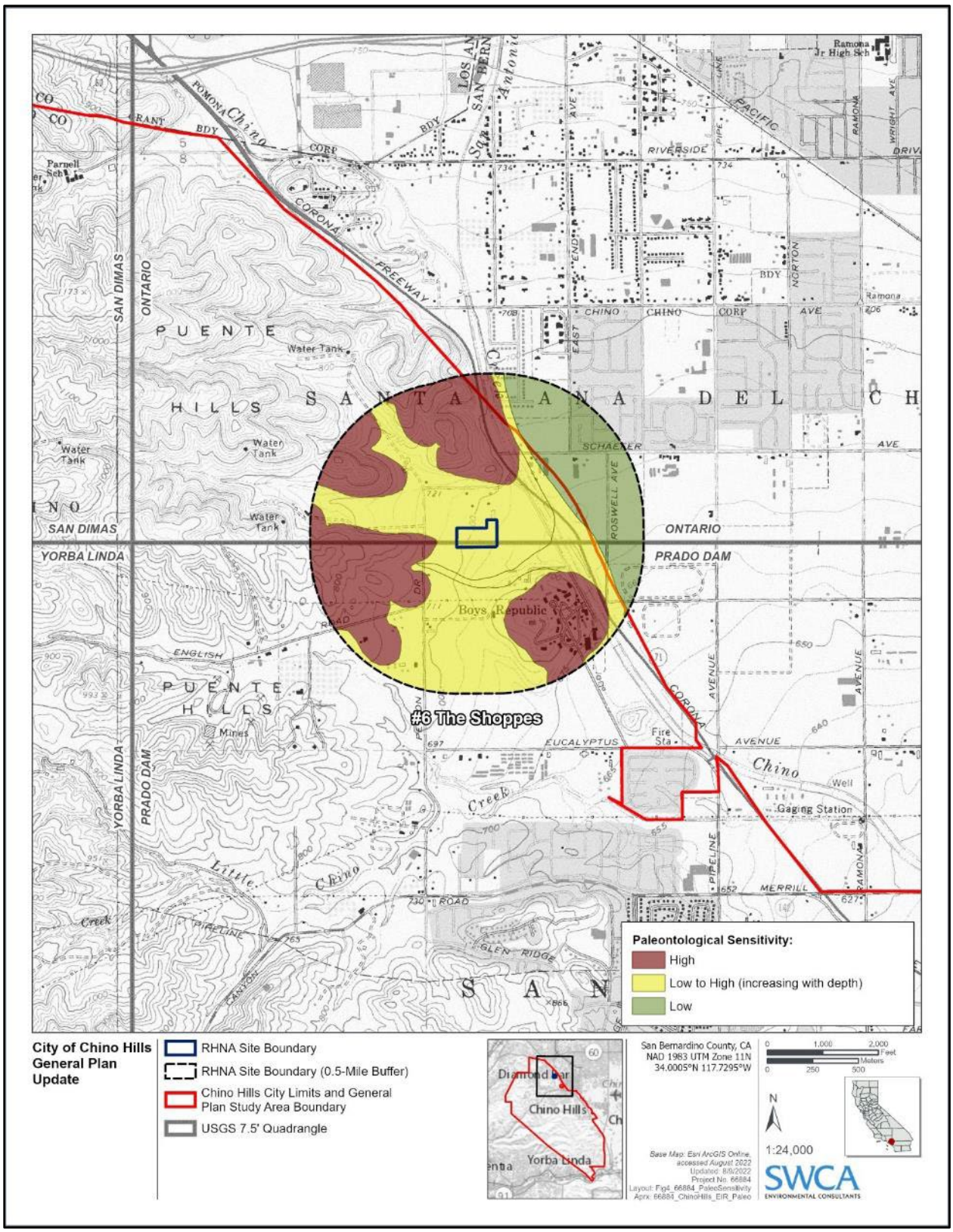


Figure D-6. Paleontological sensitivity map of the RHNA Site 6 The Shoppes.

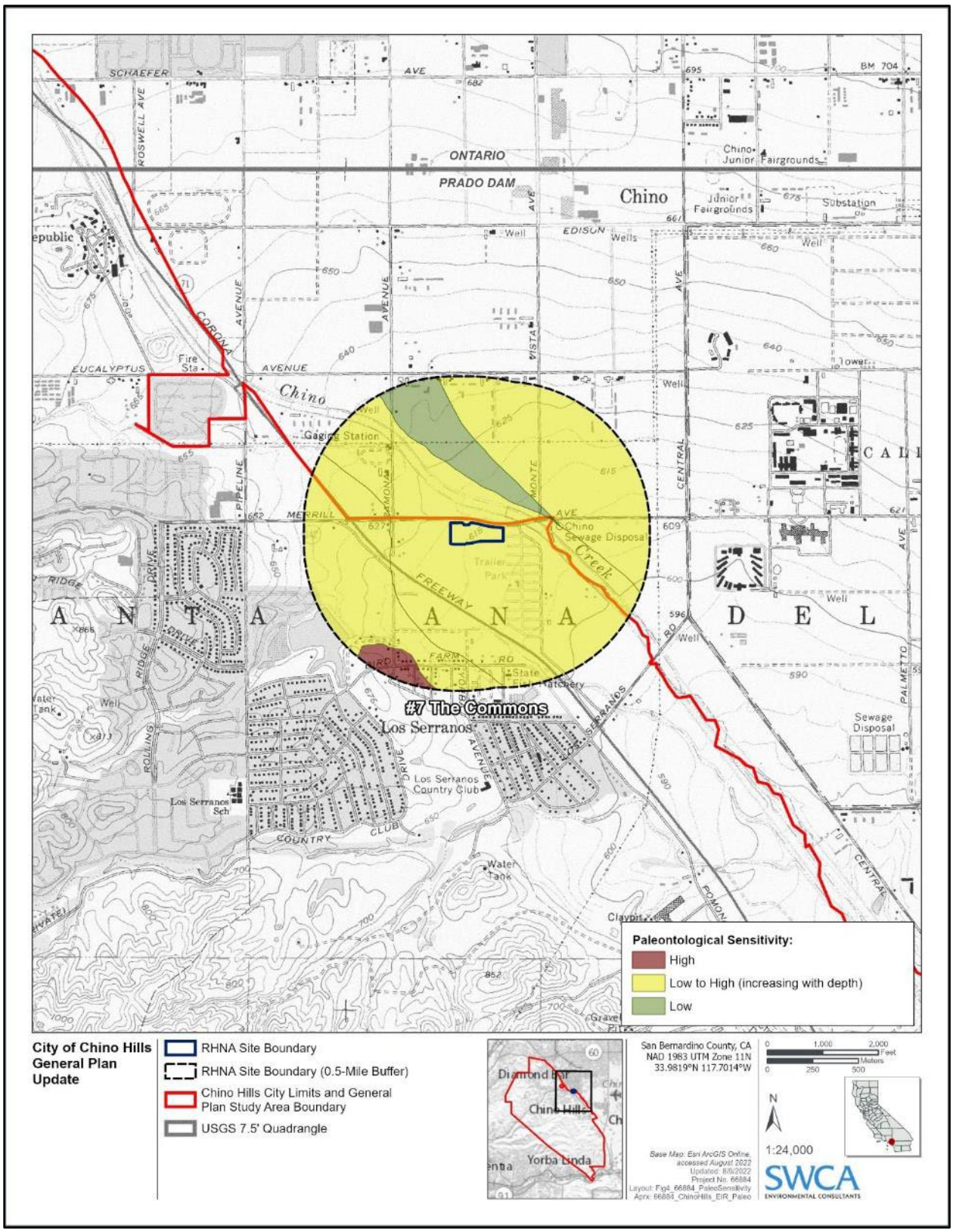


Figure D-7. Paleontological sensitivity map of the RHNA Site 7 The Commons.

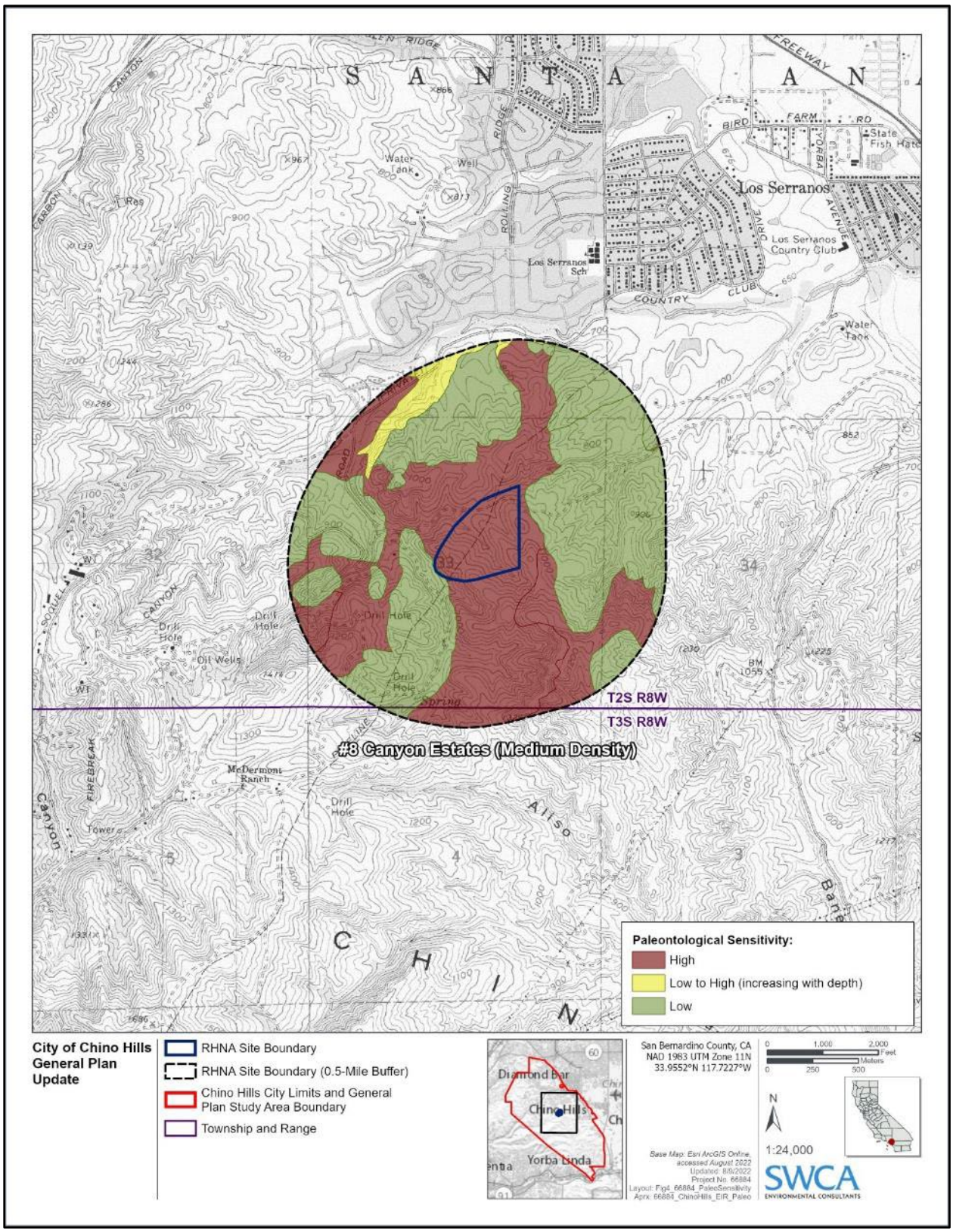


Figure D-8. Paleontological sensitivity map of the RHNA Site 8 Canyon Estates (Medium Density).

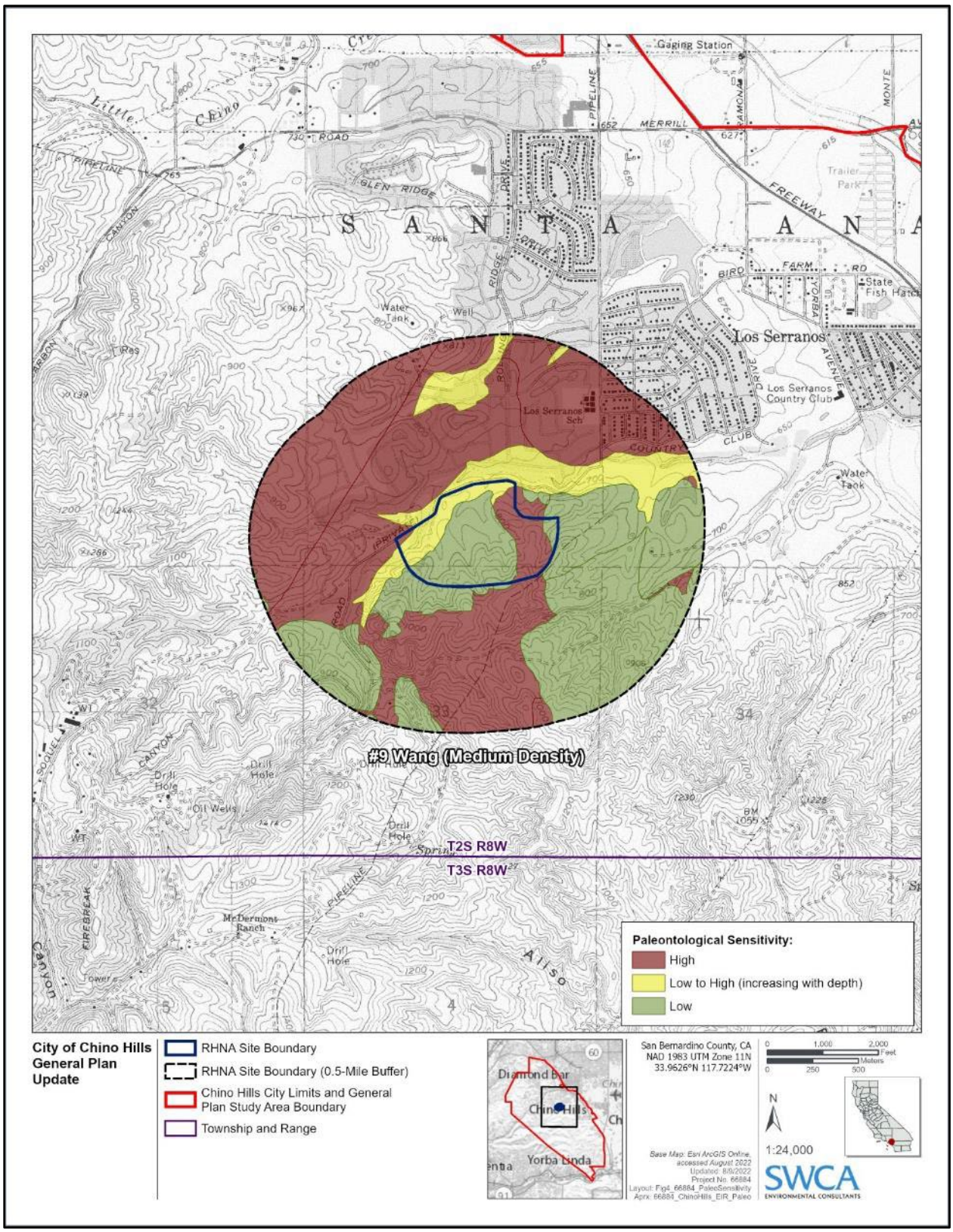


Figure D-9. Paleontological sensitivity map of the RHNA Site 9 Wang (Medium Density).

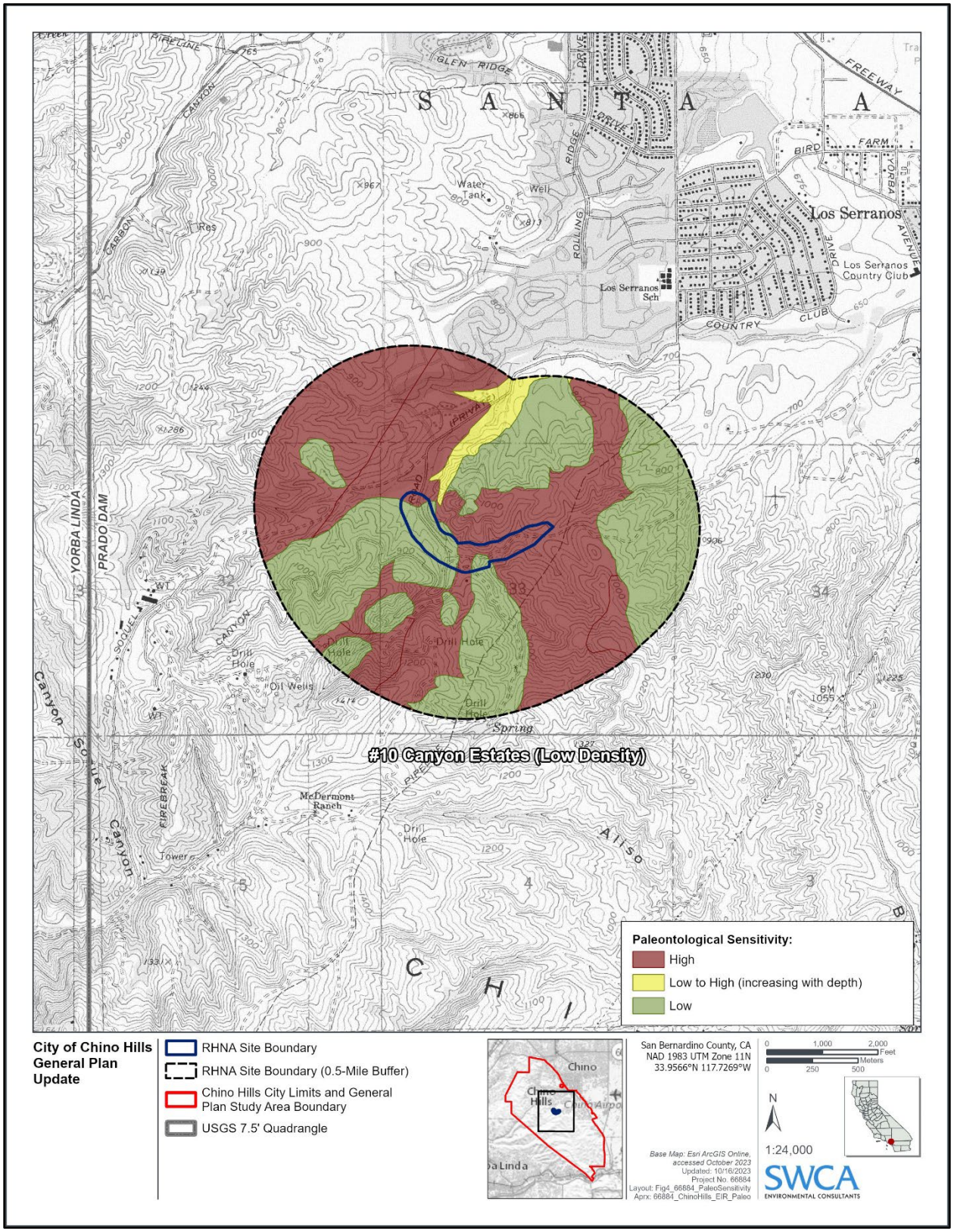


Figure D-10. Paleontological sensitivity map of the RHNA Site 10 Canyon Estates (Low Density).

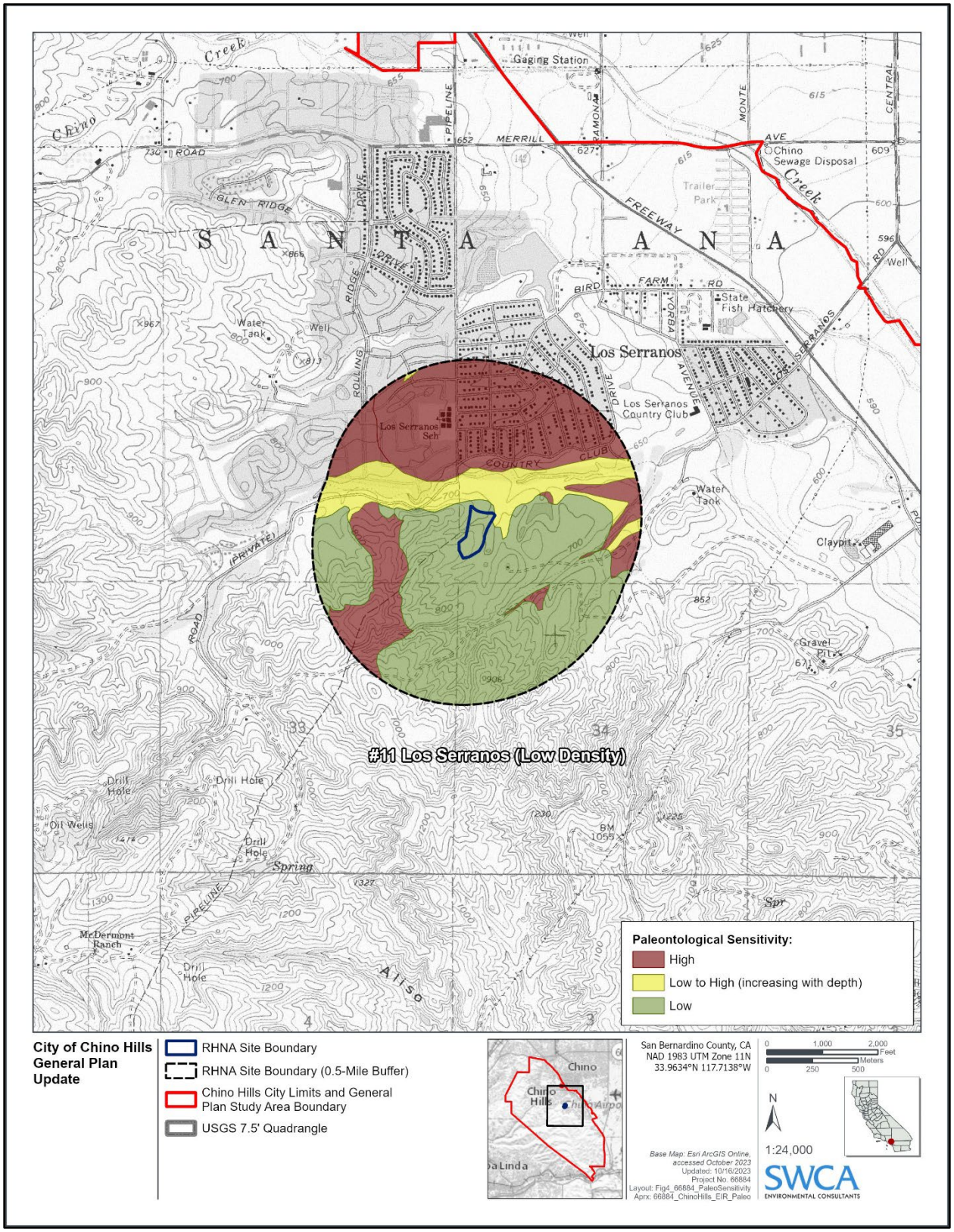


Figure D-11. Paleontological sensitivity map of the RHNA Site 11 Los Serranos (Low Density).

APPENDIX M: NOISE REPORT

Chino Hills General Plan Update

Technical Noise and Vibration Study

City of Chino Hills, CA

Prepared for:

Craig Fajnor
EcoTierra Consulting
633 W 5th Street, 26th Floor
Los Angeles, CA 90071

Prepared by:

MD Acoustics, LLC
Claire Pincock, INCE-USA
Rachel Edelman
1197 Los Angeles Ave, Ste C-256
Simi Valley, CA 93065

Date: 8/6/2024

MD ACOUSTICS
Sound Solutions for Planning and Design

Noise Study Reports | Vibration Studies | Air Quality | Greenhouse Gas | Health Risk Assessments

P) AZ - 602.774.1950 P) CA - 805.426.4477
www.mdacoustics.com
info@mdacoustics.com

TABLE OF CONTENTS

1.0 Introduction 4
1.1 Purpose of Analysis and Study Objectives 4
1.2 Existing Land Uses 4
1.3 Proposed Project Description 4

2.0 Fundamentals of Noise 7
2.1 Sound, Noise and Acoustics 7
2.2 Frequency and Hertz 7
2.3 Sound Pressure Levels and Decibels 7
2.4 Addition of Decibels 7
2.5 Human Response to Changes in Noise Levels 8
2.6 Noise Descriptors 8
2.7 Traffic Noise Prediction 9
2.8 Sound Propagation 10

3.0 Ground-Bourne Vibration Fundamentals 11
3.1 Vibration Descriptors 11
3.2 Vibration Perception 11

4.0 Regulatory Setting 12
4.1 Federal Regulations 12
4.1.1 Noise Control Act of 1972 12
4.1.2 Federal Highway Administration 12
4.1.3 The Federal Interagency Committee on Noise 13
4.2 State Regulations 14
4.2.1 California Department of Health Services 14
4.2.2 Title 24 of the California Building Code 14
4.2.3 Governor's Office of Planning and Research 14
4.3 City of Chino Hills 16
4.3.1 City of Chino Hills 2015 General Plan 16
4.3.3 City of Chino Hills Municipal Code 18

5.0 Study Method and Procedure 22
5.1 Noise Measurement Procedure and Criteria 22
5.2 FHWA Traffic Noise Prediction Model 22

6.0 Existing Noise Environment 24
6.1 Short-Term Noise Measurement Results 24
6.2 Long-Term Noise Measurement Results 25
6.3 Airport/Aircraft Noise 25

7.0 Future Noise Environment Impacts and Mitigation 26
7.1 Off-Site Traffic Noise Impacts 26
7.2 On-Site Traffic Noise Impacts 28

8.0 Construction Noise and Vibration Impacts 33
8.1 Construction Noise 33
8.2 Construction Vibration 34
9.0 CEQA Analysis 36
10.0 References 39

LIST OF APPENDICES

Appendix A: Field Measurement Data
Appendix B: Traffic FHWA Worksheets

LIST OF EXHIBITS

Exhibit A: Land Use and Potential RHNA Site Map 6
Exhibit B: Typical A-Weighted Noise Levels 7
Exhibit C: OPR Land Use Compatibility Guidelines 15
Exhibit D: Chino Hills Land Use/Noise Compatibility Matrix 16
Exhibit E: Measurement Locations 23
Exhibit F: Existing Roadway Noise Level Contours (CNEL) 30
Exhibit G: 2040 Roadway Noise Level Contours (CNEL) 31
Exhibit H: 2040 Plus Plan Roadway Noise Level Contours (CNEL) 32

LIST OF TABLES

Table 1: Loudness Perception Levels 8
Table 2: FHWA Design Noise Levels 13
Table 3: Chino Hills Exterior Noise Standards for Receiving Land Uses 20
Table 4: Short-Term Noise Measurement Data (dBA)[1] 24
Table 5: Long-Term Noise Measurement Data (dBA)[1] 25
Table 6: Traffic Noise Increases – 2040 without Project (dBA CNEL) 27
Table 7: Traffic Noise Increases – 2040 with Project (dBA CNEL) 28
Table 8: Future Traffic Noise Contours (dBA, CNEL) 29
Table 9: Typical Construction Equipment Noise Levels 33
Table 10: Guideline Vibration Damage Potential Threshold Criteria 35
Table 11: Vibration Source Levels for Construction Equipment 35

1.0 Introduction

1.1 Purpose of Analysis and Study Objectives

This noise assessment was prepared to evaluate the potential noise impacts for the project study area and to recommend noise mitigation measures, if necessary, to minimize the potential noise impacts. The assessment was conducted and compared to the noise standards set forth by the Federal, State, and Local agencies. Consistent with the City's Noise Guidelines, the project must demonstrate compliance to the applicable noise criterion as outlined within the City's Noise Element and Municipal Code.

The following is provided in this report:

- A description of the study area and the proposed project
- Information regarding the fundamentals of noise and vibration
- A description of the local noise and vibration guidelines and standards
- An analysis of traffic noise impacts to and from the project site
- An analysis of stationary noise impacts to and from the project site
- An analysis of construction noise impacts
- An analysis of ground-borne vibration impacts to and from the project site
- Suggested mitigation measures to reduce impacts

1.2 Existing Land Uses

Chino Hills is dominated by single-family housing. Other residential uses, including mobile home communities and multi-family housing developments, exist in Chino Hills but are less prevalent than single-family developments within the City. Additionally, there are several pockets of retail and light industrial land uses and parks spread throughout the city. There is also a significant amount of vacant land within the City boundaries and across its sphere of influence.

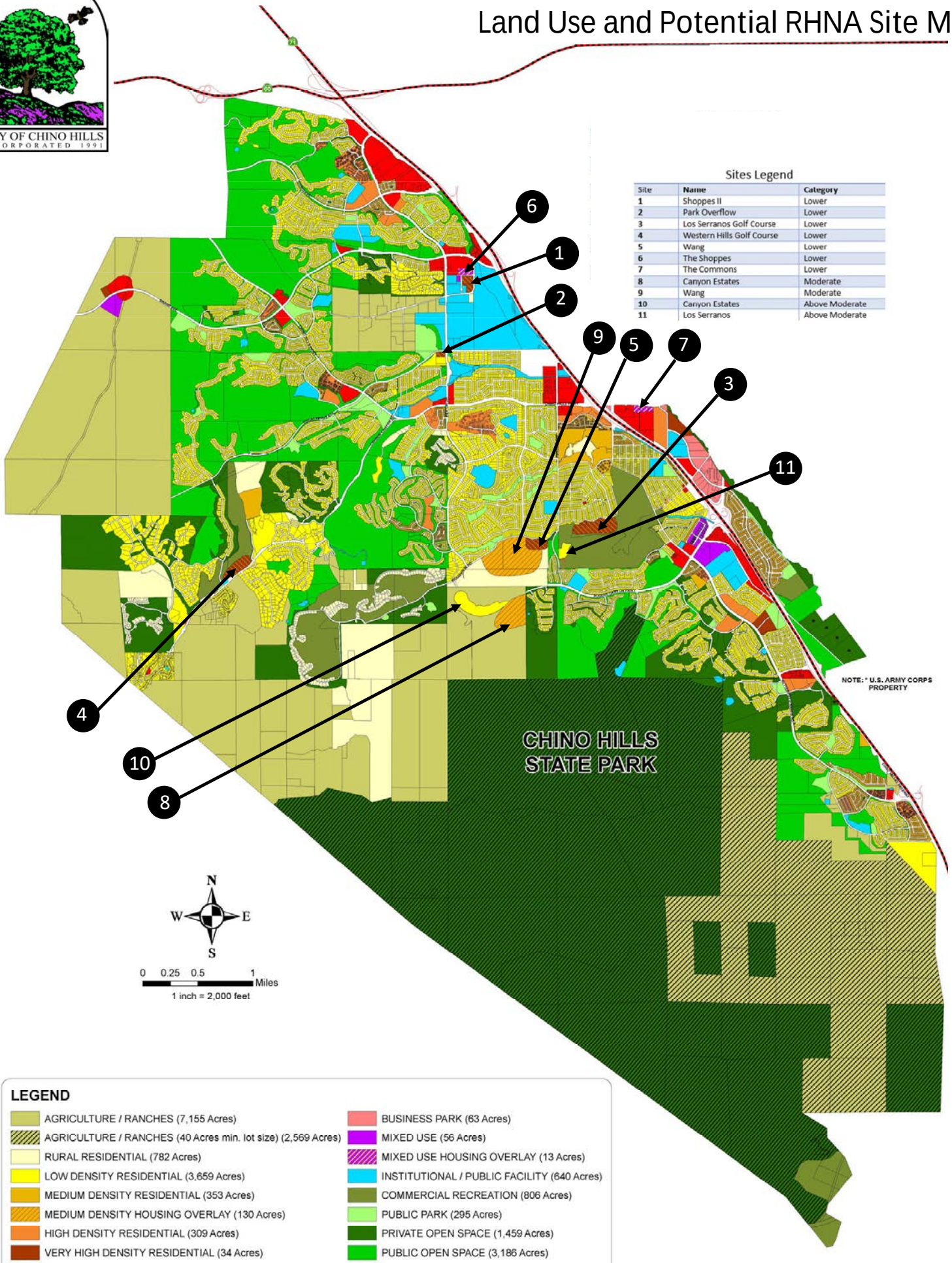
1.3 Proposed Project Description

The City of Chino Hills is preparing a comprehensive update to its existing General Plan. The updated Chino Hills General Plan is expected to be adopted in 2023 and will guide the City's development and conservation through land use objectives and policy guidance. The General Plan Update is intended to be an expression of the community's vision for the City and Study Area and constitutes the policy and regulatory framework by which future development projects will be reviewed, and public improvements will be implemented. The City will implement the General Plan Update by requiring development, infrastructure improvements, and other projects to be consistent with its policies and by implementing the actions included in the General Plan Update.

The City's General Plan was last comprehensively updated in 2015, and the Housing Element was adopted in 2022. The City's Existing General Plan Land Use Plan (Exhibit A) represents the current plan for land use development within the Study Area which includes the City and its Sphere of Influence. It includes labels indicating potential lower income RHNA sites. The purpose of this noise and vibration impact analysis is to evaluate the potential for the potential lower income RHNA sites and any changes

to the Roadway Circulation Plan to result in impacts to the community and to recommend mitigation measures when applicable.

Exhibit A
Land Use and Potential RHNA Site Map



2.0 Fundamentals of Noise

This section of the report provides basic information about noise and presents some of the terms used within the report.

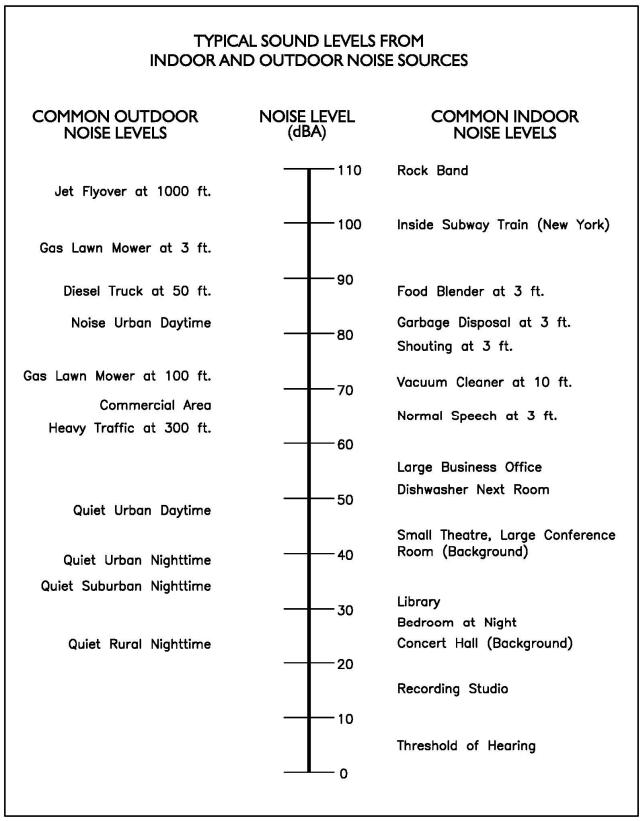
2.1 Sound, Noise and Acoustics

Sound is a disturbance created by a moving or vibrating source and is capable of being detected by the hearing organs. Sound may be thought of as mechanical energy of a moving object transmitted by pressure waves through a medium to a human ear. For traffic, or stationary noise, the medium of concern is air. *Noise* is defined as sound that is loud, unpleasant, unexpected, or unwanted.

2.2 Frequency and Hertz

A continuous sound is described by its *frequency* (pitch) and its *amplitude* (loudness). Frequency relates to the number of pressure oscillations per second. Low-frequency sounds are low in pitch (bass sounding) and high-frequency sounds are high in pitch (squeak). These oscillations per second (cycles) are commonly referred to as Hertz (Hz). The human ear can hear from the bass pitch starting out at 20 Hz all the way to the high pitch of 20,000 Hz.

Exhibit B: Typical A-Weighted Noise Levels



2.3 Sound Pressure Levels and Decibels

The *amplitude* of a sound determines it loudness. The loudness of sound increases or decreases as the amplitude increases or decreases. Sound pressure amplitude is measure in units of micro-Newton per square inch meter (N/m2), also called micro-Pascal (µPa). One µPa is approximately one hundred billionths (0.00000000001) of normal atmospheric pressure. Sound pressure level (SPL or L_p) is used to describe in logarithmic units the ratio of actual sound pressures to a reference pressure squared. These units are called decibels abbreviated dB. Exhibit B illustrates references sound levels for different noise sources.

2.4 Addition of Decibels

Because decibels are on a logarithmic scale, sound pressure levels cannot be added or subtracted by simple plus or minus addition. When two sounds or equal SPL are combined, they will produce an SPL 3 dB greater than the original single SPL. In other words, sound energy must be doubled to produce a 3 dB increase. If two sounds differ by approximately 10 dB, the higher sound level is the predominant sound.

2.5 Human Response to Changes in Noise Levels

In general, the healthy human ear is most sensitive to sounds between 1,000 Hz and 5,000 Hz, (A-weighted scale) and it perceives a sound within that range as being more intense than a sound with a higher or lower frequency with the same magnitude. For purposes of this report as well as with most environmental documents, the A-scale weighting is typically reported in terms of A-weighted decibel (dBA). Typically, the human ear can barely perceive the change in noise level of 3 dB. A change in 5 dB is readily perceptible, and a change in 10 dB is perceived as being twice or half as loud. As previously discussed, a doubling of sound energy results in a 3 dB increase in sound, which means that a doubling of sound energy (e.g. doubling the volume of traffic on a highway) would result in a barely perceptible change in sound level.

Table 1: Loudness Perception Levels

Changes in Intensity Level, dBA	Changes in Apparent Loudness
1	Not perceptible
3	Just perceptible
5	Clearly noticeable
10	Twice (or half) as loud

https://www.fhwa.dot.gov/environMent/noise/regulations_and_guidance/polguide/polguide02.cfm

2.6 Noise Descriptors

Noise in our daily environment fluctuates over time. Some noise levels occur in regular patterns, others are random. Some noise levels are constant while others are sporadic. Noise descriptors were created to describe the different time-varying noise levels.

A-Weighted Sound Level: The sound pressure level in decibels as measured on a sound level meter using the A-weighted filter network. The A-weighting filter de-emphasizes the very low and very high frequency components of the sound in a manner similar to the response of the human ear. A numerical method of rating human judgment of loudness.

Ambient Noise Level: The composite of noise from all sources, near and far. In this context, the ambient noise level constitutes the normal or existing level of environmental noise at a given location.

Community Noise Equivalent Level (CNEL): The average equivalent A-weighted sound level during a 24-hour day, obtained after addition of five (5) decibels to sound levels in the evening from 7:00 to 10:00 PM and after addition of ten (10) decibels to sound levels in the night before 7:00 AM and after 10:00 PM.

Decibel (dB): A unit for measuring the amplitude of a sound, equal to 20 times the logarithm to the base 10 of the ratio of the pressure of the sound measured to the reference pressure, which is 20 micro-pascals.

dB(A): A-weighted sound level (see definition above).

Equivalent Sound Level (LEQ): The sound level corresponding to a steady noise level over a given sample period with the same amount of acoustic energy as the actual time varying noise level. The energy average noise level during the sample period.

Habitable Room: Any room meeting the requirements of the Uniform Building Code or other applicable regulations which is intended to be used for sleeping, living, cooking or dining purposes, excluding such enclosed spaces as closets, pantries, bath or toilet rooms, service rooms, connecting corridors, laundries, unfinished attics, foyers, storage spaces, cellars, utility rooms and similar spaces.

L(n): The A-weighted sound level exceeded during a certain percentage of the sample time. For example, L10 in the sound level exceeded 10 percent of the sample time. Similarly, L50, L90 and L99, etc.

Noise: *A*ny unwanted sound or sound which is undesirable because it interferes with speech and hearing, or is intense enough to damage hearing, or is otherwise annoying. The State Noise Control Act defines noise as "...excessive undesirable sound...".

Outdoor Living Area: Outdoor spaces that are associated with residential land uses typically used for passive recreational activities or other noise-sensitive uses. Such spaces include patio areas, barbecue areas, jacuzzi areas, etc. associated with residential uses; outdoor patient recovery or resting areas associated with hospitals, convalescent hospitals, or rest homes; outdoor areas associated with places of worship which have a significant role in services or other noise-sensitive activities; and outdoor school facilities routinely used for educational purposes which may be adversely impacted by noise. Outdoor areas usually not included in this definition are: front yard areas, driveways, greenbelts, maintenance areas and storage areas associated with residential land uses; exterior areas at hospitals that are not used for patient activities; outdoor areas associated with places of worship and principally used for short-term social gatherings; and, outdoor areas associated with school facilities that are not typically associated with educational uses prone to adverse noise impacts (for example, school play yard areas).

Percent Noise Levels: See L(n).

Sound Level (Noise Level): The weighted sound pressure level obtained by use of a sound level meter having a standard frequency-filter for attenuating part of the sound spectrum.

Sound Level Meter: An instrument, including a microphone, an amplifier, an output meter, and frequency weighting networks for the measurement and determination of noise and sound levels.

Single Event Noise Exposure Level (SENEL): The dB(A) level which, if it lasted for one second, would produce the same A-weighted sound energy as the actual event.

2.7 Traffic Noise Prediction

Noise levels associated with traffic depends on a variety of factors: (1) volume of traffic, (2) speed of traffic, (3) auto, medium truck (2–3 axle) and heavy truck percentage (4 axle and greater), and sound propagation. The greater the volume of traffic, higher speeds and truck percentages equate to a louder

volume in noise. A doubling of the Average Daily Traffic (ADT) along a roadway will increase noise levels by approximately 3 dB; reasons for this are discussed in the sections above.

2.8 Sound Propagation

As sound propagates from a source it spreads geometrically. Sound from a small, localized source (i.e., a point source) radiates uniformly outward as it travels away from the source in a spherical pattern. The sound level attenuates at a rate of 6 dB per doubling of distance. The movement of vehicles down a roadway makes the source of the sound appear to propagate from a line (i.e., line source) rather than a point source. This line source results in the noise propagating from a roadway in a cylindrical spreading versus a spherical spreading that results from a point source. The sound level attenuates for a line source at a rate of 3 dB per doubling of distance.

As noise propagates from the source, it is affected by the ground and atmosphere. Noise models use hard site (reflective surfaces) and soft site (absorptive surfaces) to help calculate predicted noise levels. Hard site conditions assume no excessive ground absorption between the noise source and the receiver. Soft site conditions such as grass, soft dirt or landscaping attenuate noise at a rate of 1.5 dB per doubling of distance. When added to the geometric spreading, the excess ground attenuation results in an overall noise attenuation of 4.5 dB per doubling of distance for a line source and 7.5 dB per doubling of distance for a point source.

Research has demonstrated that atmospheric conditions can have a significant effect on noise levels when noise receivers are located 200 feet from a noise source. Wind, temperature, air humidity and turbulence can further impact have far sound can travel.

3.0 Ground-Bourne Vibration Fundamentals

3.1 Vibration Descriptors

Ground-borne vibrations consist of rapidly fluctuating motions within the ground that have an average motion of zero. The effects of ground-borne vibrations typically only cause a nuisance to people, but at extreme vibration levels, damage to buildings may occur. Although ground-borne vibration can be felt outdoors, it is typically only an annoyance to people indoors where the associated effects of the shaking of a building can be notable. Ground-borne noise is an effect of ground-borne vibration and only exists indoors, since it is produced from noise radiated from the motion of the walls and floors of a room and may also consist of the rattling of windows or dishes on shelves.

Several different methods are used to quantify vibration amplitude.

PPV – Known as the peak particle velocity (PPV) which is the maximum instantaneous peak in vibration velocity, typically given in inches per second.
RMS – Known as root mean squared (RMS) can be used to denote vibration amplitude
VdB – A commonly used abbreviation to describe the vibration level (VdB) for a vibration source.

3.2 Vibration Perception

Typically, developed areas are continuously affected by vibration velocities of 50 VdB or lower. These continuous vibrations are not noticeable to humans whose threshold of perception is around 65 VdB. Outdoor sources that may produce perceptible vibrations are usually caused by construction equipment, steel-wheeled trains, and traffic on rough roads, while smooth roads rarely produce perceptible ground-borne noise or vibration. To counter the effects of ground-borne vibration, the Federal Transit Administration (FTA) has published guidance relative to vibration impacts. According to the FTA, fragile buildings can be exposed to ground-borne vibration levels of 0.3 inches per second without experiencing structural damage.

There are three main types of vibration propagation: surface, compression, and shear waves. Surface waves, or Rayleigh waves, travel along the ground's surface. These waves carry most of their energy along an expanding circular wave front, similar to ripples produced by throwing a rock into a pool of water. P-waves, or compression waves, are body waves that carry their energy along an expanding spherical wave front. The particle motion in these waves is longitudinal (i.e., in a "push-pull" fashion). P-waves are analogous to airborne sound waves. S-waves, or shear waves, are also body waves that carry energy along an expanding spherical wave front. However, unlike P-waves, the particle motion is transverse, or side-to-side and perpendicular to the direction of propagation.

As vibration waves propagate from a source, the vibration energy decreases in a logarithmic nature and the vibration levels typically decrease by 6 VdB per doubling of the distance from the vibration source. As stated above, this drop-off rate can vary greatly depending on the soil but has been shown to be effective enough for screening purposes, in order to identify potential vibration impacts that may need to be studied through actual field tests.

4.0 Regulatory Setting

The proposed project is located in the City of Chino Hills and noise regulations are addressed through the efforts of various federal, state, and local government agencies. The agencies responsible for regulating noise are discussed below.

4.1 Federal Regulations

4.1.1 Noise Control Act of 1972

The Federal Office of Noise Abatement and Control (ONAC) originally was tasked with implementing the Noise Control Act. However, it was eventually eliminated leaving other federal agencies and committees to develop noise policies and programs. Some examples of these agencies are as follows:

- The Department of Transportation (DOT) assumed a significant role in noise control through its various agencies.
- The Federal Aviation Agency (FAA) is responsible to regulate noise from aircraft and airports.
- The Federal Highway Administration (FHWA) is responsible to regulate noise from the interstate highway system.
- The Occupational Safety and Health Administration (OSHA) is responsible for the prohibition of excessive noise exposure to workers.

The federal government advocates that local jurisdiction use their land use regulatory authority to arrange new development in such a way that “noise sensitive” uses are either prohibited from being constructed adjacent to a highway or that the developments are planned and constructed in such a manner that potential noise impacts are minimized.

Since the federal government has preempted the setting of standards for noise levels that can be emitted by the transportation source, the City is restricted to regulating the noise generated by the transportation system through nuisance abatement Codes and land use planning.
The intent of a General Plan Noise Element is to set goals to limit and reduce the effects of noise intrusion and to set acceptable noise levels for varying types of land uses. To this end, the City has the authority to set land use noise standards and place restrictions on private activities that generate excessive or intrusive noise. However, it should be recognized that the City does not have the authority to regulate all sources of noise within the City and various other agencies may supersede City authority. The following is a summary of some federal agency requirements that apply to noise within the Study Area.

4.1.2 Federal Highway Administration

Federal Highway Administration State routes and freeways that run through the City are subject to Federal funding and, as such, are under the purview of the Federal Highway Administration (FHWA). The FHWA has developed noise standards that are typically used for Federally funded roadway projects or projects that require either Federal or Caltrans review. These noise standards are based on Leq and L10 values and are included in Table 2, FHWA Design Noise Levels.

Table 2: FHWA Design Noise Levels

Activity Category	Description of Category	Design Noise Levels[1]	
		Leq (dBA)	L10 (dBA)
A	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose. Examples include natural parks or wildlife habitats.	57 (exterior)	60 (exterior)
B	Picnic areas, recreation areas, playgrounds, active sports areas, parks, residences, motels, hotels, schools, churches, libraries, and hospitals.	67 (exterior)	70 (exterior)
C	Developed lands, properties, or activities not included in Categories A or B, above.	72 (exterior)	75 (exterior)
D	Undeveloped lands.		
E	Residences, motels, hotels, public meeting rooms, schools, churches, libraries, hospitals, and auditoriums.	52 (interior)	55 (interior)

Source: FHWA Noise Standard. 23 Code of Federal Regulations 772.
Notes: Either Leq or L10 (but not both) design noise levels may be used on a project.

U.S. Department of Housing and Urban Development

The Department of Housing and Urban Development (HUD) issues formal requirements related specifically to standards for exterior noise levels along with policies for approving HUD-supported or assisted housing projects in high noise areas. In general, these requirements established three zones. These include:

- 65 dBA Ldn or less - an acceptable zone where all projects could be approved,
- Exceeding 65 dBA Ldn but not exceeding 75 dBA Ldn - a normally unacceptable zone where mitigation measures would be required, and each project would have to be individually evaluated for approval or denial. These measures must provide 5 dBA of attenuation above the attenuation provided by standard construction required in a 65 to 70 dBA Ldn area and 10 dBA of attenuation in a 70 to 75 dBA Ldn area, and
- Exceeding 75 dBA Ldn - an unacceptable zone in which projects would not, as a rule, be approved.

4.1.3 The Federal Interagency Committee on Noise

The Federal Interagency Committee on Noise (FICON) developed guidance for the assessment of project-generated increases in noise levels that consider the ambient noise level. The FICON recommendations are based on studies of the percentage of persons highly annoyed by aircraft noise. These recommendations are often used for different types of environmental noise such as traffic noise. A readily perceptible 5 dBA or greater project-related noise level increase is considered a significant impact

when the noise criteria for a given land use is exceeded. In areas where the existing noise levels range from 60 to 65 dBA Ldn, a 3 dBA barely perceptible noise level increase is considered significant. When the existing noise levels already exceed 65 dBA Ldn, any increase in community noise louder than 1.5 dBA or greater is considered a significant impact since it likely contributes to an existing noise exposure exceedance.

4.2 State Regulations

4.2.1 California Department of Health Services

The California Department of Health Services (DHS) Office of Noise Control studied the correlation of noise levels and their effects on various land uses. As a result, the DHS established four categories for judging the severity of noise intrusion on specified land uses. These categories are presented in the State Land Use Compatibility for Community Noise Exposure table. As part of the 2040 General Plan update the City has adopted a slightly modified version of this table to use as a planning tool. This table discussed further and presented in Section 4.3.1.

4.2.2 Title 24 of the California Building Code

Section 1206.4 of the California Building Code (2019), Title 24, Part 2, Chapter 12 (Interior Environment), establishes an interior noise criterion of 45 dBA CNEL for “dwelling units”. Per California Building Code, Title 24, Part 2, Chapter 2 (Definitions), a residential dwelling unit is intended to be used as a residence that is primarily long-term in nature. Residential dwelling units do not include transient lodging, inpatient medical care, licensed long-term care, and detention or correctional facilities.

California Building Code (2019), Title 24, Part 2, Chapter 5 (Nonresidential Mandatory Measures), applies to all proposed buildings that people may occupy but are not residential dwelling units, with the exception of factories, stadiums, storage, enclosed parking structures, and utility buildings. Section 5.507.4.1 requires wall and roof-ceiling assemblies exposed to the noise source making up the building, or addition envelope or altered envelope, shall meet a composite Sound Transmission Class (STC) rating of at least 50 or a composite Outdoor to Indoor Transmission Class (OITC) rating of no less than 40, with exterior windows of a minimum STC of 40 or OITC of 30.

4.2.3 Governor’s Office of Planning and Research

The Governor’s Office of Planning and Research (OPR) outlines that a noise element Is required in each city’s and county’s general plan. The plan must include guidelines for noise-compatible land uses. The guidelines typically rank noise land use compatibility in terms of normally acceptable, conditionally acceptable, normally unacceptable, and clearly unacceptable as illustrated in Exhibit C. Those charts identify “normally acceptable,” “conditionally acceptable,” “normally unacceptable,” and “clearly unacceptable” exterior noise levels for various land uses. A “conditionally acceptable” designation implies new construction or development should be undertaken only after a detailed analysis of the noise reduction requirements for each land use is made and needed noise insulation features are incorporated in the design. By comparison, a “normally acceptable” designation indicates that standard construction can occur with no special noise reduction requirements. The OPR suggestions also include

suggested adjustments for certain conditions such as seasonal corrections, corrections for outdoor residual noise levels, corrections for previous exposure and community attitudes, and corrections for pure tone or impulse noises.

Exhibit C: OPR Land Use Compatibility Guidelines

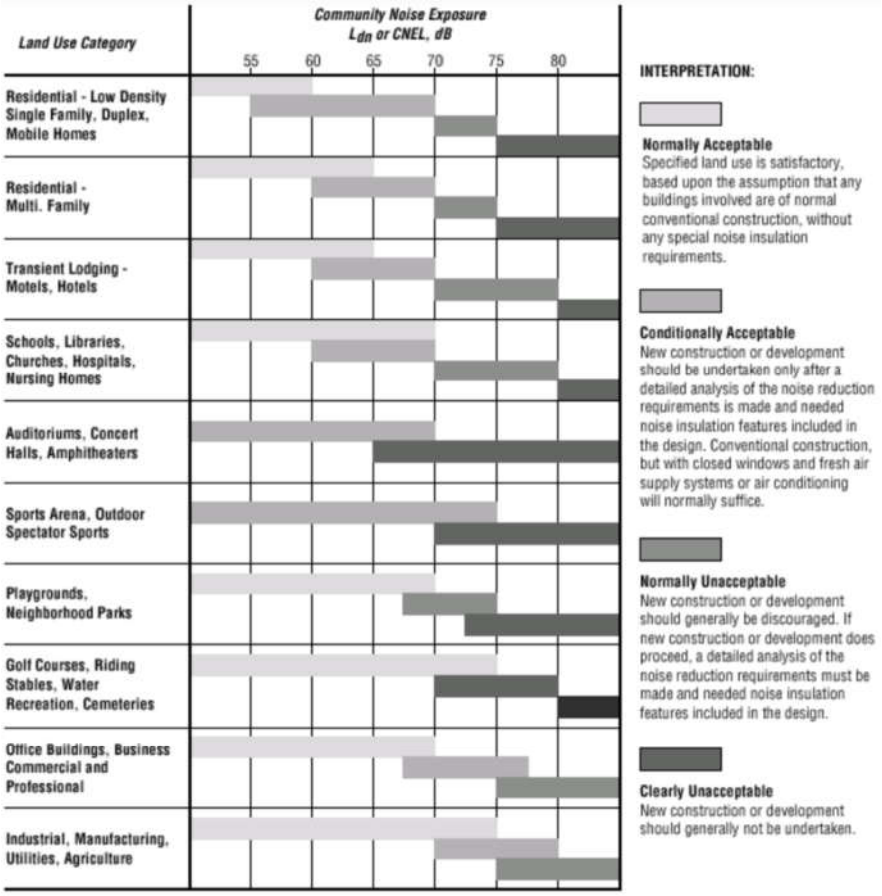


Table 1

Type of Correction	Description	Amount of Correction to be Added to Measured CNEL in dB
Seasonal Correction	Summer (or year-round operation)	0
	Winter only (or windows always closed)	- 5
Correction for Outdoor Residual Noise Level	Quiet suburban or rural community (remote from large cities and from industrial activity and trucking).	+ 10
	Quiet suburban or rural community (not located near industrial activity).	+ 5
	Urban residential community (not immediately adjacent to heavily traveled roads and industrial areas).	0
	Noisy urban residential community (near relatively busy roads or industrial areas.	- 5
	Very noisy urban residential community.	- 10
Correction for Previous Exposure and Community Attitudes	No prior experience with the intruding noise.	+ 5
	Community has had some previous exposure to intruding but little effort is being made to control the noise. This correction may also be applied in a situation where the community has not been exposed to the noise previously, but the people are aware that bona fide efforts are being made to control the noise.	0
	Community has had considerable previous exposure to the intruding noise and the noise maker's relations with the community are good.	- 5
	Community aware that operation causing noise is very necessary and it will not continue indefinitely. This correction can be applied for an operation of limited duration and under emergency circumstances.	- 10
Pure Tone or Impulse	No pure tone or impulsive character.	0
	Pure Tone or impulsive character present.	+ 5

4.3 City of Chino Hills

Existing planning policies and noise regulations applicable to noise within the City of Chino Hills are presented in the Noise Element of the City of Chino Hills General Plan and within the City of Chino Hills Municipal Code. Applicable goals, policies, and regulations are presented below.

4.3.1 City of Chino Hills 2015 General Plan

Noise/Land Use Compatibility

Exhibit D, Land Use/Noise Compatibility presents the existing land use compatibility chart for Chino Hills. Typically these charts are derived from the table presented in Exhibit C. The 2015 Chino Hills General Plan instead presents a single interior and exterior CNEL limit for each land use category as applicable.

Exhibit D: Chino Hills Land Use/Noise Compatibility Matrix

Table 7-1 – Land Use/Noise Compatibility Matrix

Land Use Categories		CNEL	
Categories	**Compatible Uses**	**Interior[1]**	**Exterior[2]**
Residential	Single-Family, Duplex, Multiple-Family	45[3]	65[5]
	Mobile Homes	--	65[4]
Commercial	Hotel, Motel, Transient Lodging	45[3]	65
	Commercial, Retail, Bank, Restaurant, Health Clubs	55	--
	Office Buildings, Research and Development, Professional Offices	50	--
	Amphitheater, Concert Hall, Auditorium, Meeting Hall, Movie Theater	45	--
	Gymnasium (multi-purpose)	50	--
	Manufacturing, Warehousing, Wholesale, Utilities	65	--
Open Space	Parks	--	65
Institutional/ Public Facility	Hospital, Schools, Classrooms	45[3]	65
	Churches, Libraries	45[3]	--

Interpretation:

1. Interior environment excludes bathrooms, toilets, closets, and corridors.
2. Outdoor environment limited to private yard of single-family or multifamily residential private patio that is accessed by a means of exit from inside the unit; mobile home park; hospital patio; park picnic area; school playground; and hotel and motel recreation area.
3. Noise level requirement with closed windows. Mechanical ventilating system or other means of natural ventilation shall be provided pursuant to UBC requirements.
4. Exterior noise level shall be such that interior noise level will not exceed 45 dB CNEL.
5. Multifamily developments with balconies that do not meet the 65 dB CNEL standard are required to provide occupancy disclosure notices to all future tenants regarding potential noise impacts.

MD recommends implementing a Land Use Compatibility Matrix similar to Exhibit C to allow for flexible planning.

General Plan Goals, Policies and Actions
The 2015 General Plan Noise Element includes the following goals, policies and actions that are intended to avoid or reduce noise impacts related to transportation, stationary, and construction related noise sources.

Goal N-1: Manage Existing Noise Sources.

Policy N-1.1: Protect public health and welfare by eliminating or minimizing the effects of existing noise problems.

> **Action N-1.1.1:** Control noise conditions in Chino Hills through the active, ongoing efforts of the City in coordination with other government agencies.
>
> **Action N-1.1.2:** Increase public input on environmental noise issues, and establish a program for the monitoring and abatement of local noise sources.
>
> **Action N-1.1.3:** Prohibit large commercial truck traffic in noise-sensitive areas, such as school sites, located in Chino Hills.
>
> **Action N-1.1.4:** Restrict truck traffic to roadways that are located away from sensitive land uses.
>
> **Action N-1.1.5:** Minimize through vehicular traffic in the City's residential areas.
>
> **Action N-1.1.6:** Enforce state motor vehicle noise standards for cars, trucks, and motorcycles.
>
> **Action N-1.1.7:** Incorporate sound attenuation measures in residential developments to achieve the City's standards. Such sound attenuation measures may include noise barriers, replacing existing windows and doors with sound-rated assemblies, insulating exterior walls and attics, and/or installing forced air ventilation.
>
> **Action N-1.1.8:** Incorporate sound attenuation measures in commercial and industrial developments to ensure that mechanical equipment does not generate excessive noise levels.

Policy N-1.2: Where complaints are received by residents with regard to non-transportation noise sources (e.g., commercial/retail equipment or activities, fans, air conditioners), the City will protect the public health and welfare by implementing the following Action statement as necessary to ensure that the non-transportation noise source does not exceed the noise standards identified in Titles 6, 8 and 16 of the City of Chino Hills Municipal Code.

Action N-1.2.1: Ensure that equipment, machinery, fan, and air conditioning noise does not exceed specified levels, established in the City's Noise Ordinance.

Goal N-2: Limit New Noise Conflicts.

Policy N-2.1: Minimize increases in noise levels due to new land use and transportation facility decisions.

Action N-2.1.1: Action N-2.1.1: Enforce the standards of Table 7-1 – Land Use/Noise Compatibility Matrix (Exhibit D in this report), which specify acceptable exterior and interior noise limits for various land uses throughout the City.

Action N-2.1.2: Continue to assess projects through the subdivision, site plan, conditional use permit, and other development review processes and incorporate conditions of approval and mitigation measures that ensure noise compatibility where appropriate.

Action N-2.1.3: Require a noise study to be performed and appropriate noise attenuation to be incorporated to reduce interior noise levels to 45 dB CNEL or less prior to approving any multifamily or mixed-use residential development in an area with a CNEL of 65 dB or greater.

Action N-2.1.4: Incorporate ambient noise level considerations into land use decisions involving schools, hospitals, and similar noise sensitive uses.

Action N-2.1.5: Ensure all new developments provide adequate sound insulation or other protection from existing and projected noise sources.

Action N-2.1.6: Design new transportation facilities to minimize noise impacts on nearby sensitive sources.

Action N-2.1.7: Ensure that all new hotels, motels, multifamily and single-family dwellings to be developed within an area where the outdoor CNEL exceeds 60 dB are designed to achieve an indoor CNEL of 45 dB or less.

4.3.3 City of Chino Hills Municipal Code

The City Noise Ordinance is designed to protect people from non-transportation noise sources such as construction activity; commercial, industrial, and agricultural operations; machinery and pumps; and air conditioners. Enforcement of the ordinance ensures that adjacent properties are not exposed to excessive noise from stationary sources. Enforcing the ordinance includes requiring proposed development projects to show compliance with the ordinance, including operating in accordance with noise levels and hours of operations limits placed on the project site. The City also requires construction activity to comply with established work schedule limits. The ordinance is reviewed periodically for adequacy and amended as needed to address community needs and development patterns. The following City codes are related to noise.

6.04.040 - Noisy or at-large animals—Public nuisance.

A. Any animal, animals, or fowl which molest passersby or passing vehicles, attack other animals, trespass on school grounds, is repeatedly at large, damages and/or trespasses on private or public property, barks, whines, howls, honks, squeals, screeches, or otherwise makes or creates excessive, continuous, or untimely noise shall be considered and deemed a nuisance.

B. Every person who maintains, permits, or allows a public nuisance to exist upon his or her property or premises, and every person occupying or leasing the property or premises of another and who maintains, permits, or allows a public nuisance as described above to exist on such property, after reasonable notice in writing from the City or agents of the City has been served upon such person to cease such nuisance, is guilty of a misdemeanor and subject to punishment in accordance with state law and Section 1.36.010 et seq. of this Code. The existence of such nuisance for each and every day after the service of such notice shall be deemed a separate and distinct offense.

8.08.020 - Regulation of construction and property maintenance noise.

A. Except when necessary for the immediate preservation of life, health, or property, no person shall construct, repair, remodel, demolish, or grade any real property or structures thereon at any time other than between the hours of 7:00 a.m. and 7:00 p.m. on weekdays, and between 8:00 a.m. and 6:00 p.m. on Saturdays, excluding federal holidays. Notwithstanding the foregoing, an individual residential property owner or tenant in addition to the above permissible hours of construction may also construct, repair, or remodel his or her real property or any structure on such property during the hours of 7:00 p.m. and 10:00 p.m. on weekdays and between 6:00 p.m. and 10:00 p.m. on Saturdays, and between the hours of 8:00 a.m. and 10:00 p.m. on Sundays and federal holidays provided that the noise or sounds associated with such activities cannot be heard by a reasonable person beyond the boundary lines of the property.

B. No property owner, tenant, or contractor thereof shall operate or allow the operation of mobile, outdoor mechanical or electrical equipment (e.g., lawn mowers, leaf blowers, hedge trimmers, etc.) that generates noise or sounds that can be heard by a reasonable person beyond the boundary lines of the property at any time other than between the hours of 7:00 a.m. and 8:00 p.m. on weekdays, and between 8:00 a.m. and 7:00 p.m. on Saturdays, Sundays, and federal holidays. This provision shall not apply to the operation of a fixed noise source (e.g., air conditioning units, pool equipment, etc.) that conforms to the noise standards pursuant to Section 16.48.020.

C. Any person violating this section, shall be guilty of an infraction and subject to punishment in accordance with Section 1.36.030 of this Code.

D. Any violation of this section is deemed and declared to be a public nuisance and subject to punishment and abatement as provided in this Code and state law.

13.20.170 - Trucks—Noise.

To protect the public health, safety, and quiet enjoyment of the residents of the City, the noise level for the collection vehicles during the stationary compaction process shall not exceed seventy-five (75) decibels at a distance of twenty-five (25) feet from the collection vehicle and at an elevation of five (5) feet from the horizontal base place of such vehicles.

16.09.100 - Commercial outdoor patio guidelines.

A. The hours of operation for the outdoor patio shall be between 7:00 a.m. and 10:00 p.m. everyday or as modified by the Planning Commission based on compatibility of the neighboring residential uses and the results of the acoustical analysis findings.
B. The noise levels of the outdoor patio shall be in compliance with the City's noise standards.
C. If the outdoor patio is located adjacent to a residential use, an acoustical analysis shall be required to demonstrate the proposed outdoor patio will comply with the City's noise standards (CHMC 16.48.020).

16.12.070 - Entertainment establishments providing dancing, music, and similar activities.
A. Noise levels shall not exceed the standards set forth in Chapter 16.48 of this Development Code, when measured at the nearest residential property line.
C. Dancing, music, and similar entertainment uses shall not be permitted between the hours of 2:00 a.m. and 10:00 a.m.
D. The City may apply additional requirements or limitations to ensure compatibility with surrounding land uses where the use in question relies upon a Conditional Use Permit, Temporary Use Permit, or other discretionary permit.

16.48.020 – Noise
Part A outlines definitions for this section.
Part B outlines exemptions to the chapter including occasional outdoor gatherings, public school-sponsored activities, typical park or playground activities, temporary emergency noise, necessary warning devices, construction noise in accordance with 8.08.020, preempted activities, and animal noise in accordance with 6.04.040.
Part C defines the requirements for noise level measurements.
Part D outlines that vibration may not be perceptible (0.05 in/sec) on any affected property adjoining the property of the vibration source.
Part E presents the city's exterior sound level limits as outlined in Table 3 below.

Table 3: Chino Hills Exterior Noise Standards for Receiving Land Uses

Zone	Land Use of Receiving Property	Maximum Permitted Exterior Sound Pressure Level, Leq (dBA)	
		7:00 a.m. to 10:00 p.m.	10:00 p.m. to 7:00 a.m.
I	Single-Family Residential	60	45
II	Multi-Family Residential, Mobile Home Parks	65	45
III	Commercial Property and Institutional Property	70	60
IV	Residential Portion of Mixed Use	65	45
V	Manufacturing and Industrial, Other Uses	75	70

Source: City of Chino Hills Municipal Code 16.48.020
Notes:
1. The city's noise element includes a noise compatibility matrix with community noise equivalent level (CNEL) and is intended to apply to long term ambient noise levels that are produced by sources such as traffic and evaluated over twenty-four (24) hours. Table 1 includes noise standards levels in terms of Leq. These levels are applicable to sounds that have shorter durations than twenty-four (24) hours.
2. If the ambient noise level exceeds the maximum permitted sound level indicated in the table, the applicable maximum permitted sound level pressure shall be three (3) dB above the ambient noise level.
3. Measurements for compliance are made on the affected property pursuant to the details in section C. noise level measurements, 2. exterior noise level measurements.

These levels are adjusted if less than 30 minutes in an hour or for impulse noises, tonal noises, and noises consisting of speech of music.

Part F presents the residential interior limits of 45 dBA from 10 PM to 7 AM and 55 dBA from 7 AM to 10PM. Adjacent multifamily units may not produce noise that results in a perceptible increase in sound level above the ambient in another unit between 10 PM and 7 AM.
Part G outlines prima facie violations in residential areas of audible noise producing machines at night and sound amplifiers at any time.

5.0 Study Method and Procedure

The following section describes the noise modeling procedures and assumptions used for this assessment.

5.1 Noise Measurement Procedure and Criteria

MD took noise measurements for the proposed General Plan update at 26 locations. Six (6) 24-Hour long-term noise measurement and 20 (twenty) 20-minute short-term noise measurements were taken throughout the City. Appendix A includes the measured noise data. Exhibit E illustrates the location of the measurements.

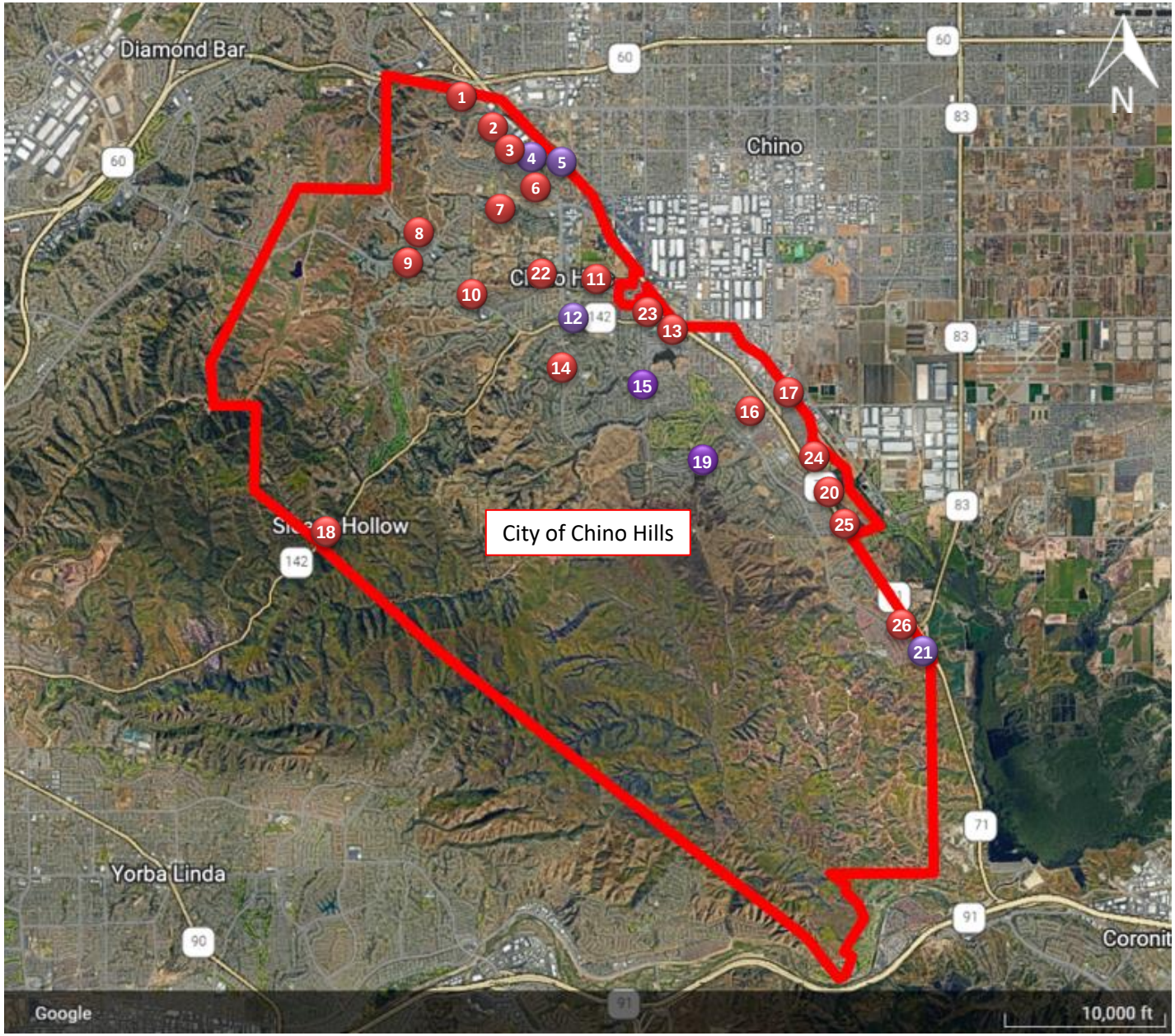
5.2 FHWA Traffic Noise Prediction Model

Existing, Future, and Future plus Plan traffic noise from vehicular traffic was projected using a computer program that replicates the FHWA Traffic Noise Prediction Model (FHWA-RD-77-108). The FHWA model arrives at the predicted noise level through a series of adjustments to the Reference Energy Mean Emission Level (REMEL).

Traffic information from the general plan traffic data was utilized for modeling purposes. Inputs for the FHWA model, including road classification, speed, land distance, and vehicle mix, were taken from the noise modeling for the 2015 General Plan Draft EIR appendix. Data input is provided in Appendix B.

The Traffic Study analyzed future conditions in the Year 2029 and Year 2040, with 2023 as the base year. The Study included known development projects (cumulative projects) in the vicinity, including the City of Chino Hills and the City of Chino, which research revealed 20 cumulative projects in Chino Hills and 19 cumulative projects in the City of Chino. Further, the Study applied a 2 percent ambient growth factor to capture development in projects outside of the study area (City of Chino) in other jurisdictions. The known cumulative projects with the ambient growth factor are accounted for in the near-term horizon Year 2029 and long-term horizon Year 2040. The General Plan Update (the Project) trip generation was added to the cumulative Year 2029 and cumulative Year 2040 analysis. The noise analysis is based on the existing and future cumulative traffic growth.

Exhibit E
Noise Measurement Location Map



x = Short-Term measurement (20-MInute)

x = Long-Term measurement (24-Hour)

6.0 Existing Noise Environment

20 short-term (20-minute) and six (6) long-term (24 to 72-hour) ambient noise measurements were conducted around the City for the 2040 General Plan Update on 5/4/2022. The measurements measured the Leq, Lmin, Lmax and other statistical data (e.g. L2, L8). The noise measurements were taken to determine the existing baseline noise conditions.

6.1 Short-Term Noise Measurement Results

The results of the short-term noise data are presented in Table 4.

Table 4: Short-Term Noise Measurement Data (dBA)[1]

Noise Monitoring Location	Time	Leq	Lmin	Lmax
1 - 2427 Scenic Ridge Dr	7:31-7:52 AM	60.3	54.4	75.9
2 - 13104 Glen Ct	8:05-8:26 AM	52.8	43.5	76.0
3 - Rolling Village Dr	8:42-9:03 AM	62.6	45.8	78.8
6 - Ridgefield Dr	9:39-10:00 AM	48.2	39.0	66.2
7 - 2936 Sunny Brook Ln	10:12-10:33 AM	54.0	40.4	79.7
8 - 14100 Heathervale Dr	10:45-11:06 AM	62.1	36.9	80.6
9 - Willow Wood Ln	11:20-11:41 AM	69.3	40.6	80.3
10 - Moon Rise Ln	1:47-2:08 PM	68.7	47.6	82.5
11 - 14514 Foxglove Dr	2:20-2:41 PM	63.4	48.0	75.3
13 - 4488 Village Dr	2:54-3:15 PM	59.5	48.5	75.8
14 - 3384 Gabriel Dr	3:32-3:53 PM	64.9	39.9	89.6
16 - 5022 Pomona Rincon Rd	4:35-4:56 PM	55.2	49.7	72.0
17 - 15461 Timberidge Ln	11:06-11:27 AM	70.3	55.8	83.9
18 - 16860 Oak Way Ln	10:16-10:37 AM	70.2	44.3	89.1
20 - Rosebud Ct	8:53-9:14 AM	61.9	54.2	67.7
22 - 3280 Eucalyptus Ave	4:04-4:25 PM	64.2	47.4	79.5
23 - Chino Hills Parkway	3:07-3:28 PM	66.3	55.9	84.3
24 - 16333 Fairfield Ranch Rd	5:46-6:07 PM	73.7	66.3	86.3
25 - Pine Ave	2:18-2:39 PM	65.4	54.6	89.3
26 - Butterfield Ranch Rd	1:48-2:09 PM	62.1	49.7	83.5

Notes:
1. Measurements were taken over a twenty-minute interval. Measurement locations are indicated in Exhibit E.

Short-term noise data indicates the ambient noise levels ranged between 48.2 to 73.7 dBA Leq. The measured noise levels and field notes indicate that traffic noise is the main source of noise impacting the project site.

Locations 1-21, 25, and 26 are residential areas. Location 22 is a park. Location 23 is commercial. Location 24 is a sports complex. Locations 3, 8, 9, 10, 11, 14, 17, 18, and 20 exceed the maximum permitted exterior sound pressure levels given in Table 16.48-1 of the municipal code.

6.2 Long-Term Noise Measurement Results

The results of the long-term noise data are presented in Table 5. These measurements were taken from 5/4/22 to 5/6/22. Long-term noise data indicates the ambient noise levels ranged between 65.9 to 74.8 dBA CNEL. The measured noise levels and field notes indicate that traffic noise is the main source of noise impacting the project site.

Table 5: Long-Term Noise Measurement Data (dBA)[1]

Noise Monitoring Location	CNEL	Highest 1-hour Leq	Hour	Lowest 1-hour Leq	Hour
4 - 3059 Galaxy Pl	69.8	67.9	7:28-8:28 AM	57.1	1:28-2:28 AM
5 - 3238 Skyview Ridge	80.5	76.7	6:06-7:06 AM	69.2	1:06-2:06 AM
12 - 3456 Whirlaway Ln	74.8	76.4	2:55-3:55 PM	56.7	1:55-2:55 AM
15 - 15567 Sandlewood Ln	68.0	68.3	1:29-2:29 PM	52.2	2:29-3:29 AM
19 - 4597 St Andrews Dr	67.2	70.3	5:00-6:00 PM	46.7	2:00-3:00 AM
21 - 17957 Lariat Dr	86.0	82.6	6:00-7:00 AM	71.0	3:00-4:00 PM

Notes:
1. Measurements were taken over a 24-hour interval. Measurement locations are indicated in Exhibit E.

Locations 4, 5, 12, 15, 19, and 21 exceed the single-family residential limit of 60 dBA Leq from the municipal code and the 65 dBA CNEL exterior noise compatibility limit for residential uses.

6.3 Airport/Aircraft Noise

There are no airports located within the Study Area. The closest airport to the Study Area is the Chino Airport located approximately 2 miles east of the Study Area. The city limits are outside of the 2028 55 dBA CNEL contours of the Chino Airport per the Chino Airport Master Plan (Feb 2006).

7.0 Future Noise Environment Impacts and Mitigation

This assessment analyzes future noise impacts to the project and compares the results to the City's Noise Standards. The analysis details the estimated exterior noise levels associated with traffic from adjacent roadway sources.

7.1 Off-Site Traffic Noise Impacts

The potential off-site noise impacts caused by the increase in vehicular traffic as a result of the project were calculated at a distance of 50 feet. Roadways wider than 100 ft., SR-71 and Pomona Freeway, were calculated at a distance of 100 feet. The distance to the 55, 60, 65, and 70 dBA CNEL noise contours are also provided for reference. The noise level at 50 feet is representative of approximate distances to existing land uses along the subject roadway. The noise contours were calculated for the following scenarios and conditions:

- Year 2023 Condition: This scenario refers to the existing 2023 traffic noise condition.
- Year 2040 Condition: This scenario refers to the 2040 traffic noise condition without the General Plan buildout.
- Year 2040 Plus Project Condition: This scenario refers to the 2040 plus General Plan buildout traffic noise condition.

Without Project Scenario

Year 2023 and Year 2040 and the resulting increase without the project are shown in Table 6. Table 6 shows that traffic noise increases without the project from 2023 to 2040 would be up to 2.5 dBA CNEL. There are no segments that would increase greater than 3 dB, which is a perceptible change in noise level. The impact is, therefore, less than significant.

<Table 6, Next Page>

Table 6: Traffic Noise Increases – 2040 without Project (dBA CNEL)

ROADWAY	SEGMENT LIMITS	Year 2023 Level at 50 ft.	Year 2040 Level at 50 ft.	Increase without Project	Potentially Significant?
Grand Avenue	Peyton Dr. to SR-71	75.2	76.3	1.1	No
	Chino Hills Pkwy. to Peyton Dr.	71.1	72.6	1.5	No
Boys Republic Drive	South of Shoppes Dr.	66.8	67.5	0.7	No
Peyton Drive	North of Chino Ave.	74.2	75.1	0.9	No
	Chino Ave to Grand Ave.	73.0	74.0	0.9	No
	Grand Ave to Eucalyptus Ave.	72.8	73.7	0.9	No
	Eucalyptus Ave to Chino Hills Pkwy.	71.7	72.6	1.0	No
	Chino Hills Pkwy to Woodview Rd.	65.3	66.5	1.2	No
Carbon Canyon Road	Chino Hills Pkwy. To Feldspar Dr.	71.7	73.7	2.0	No
	South of Feldspar Dr.	70.6	73.1	2.5	No
Chino Hills Parkway	Eucalyptus Ave to Carbon Canyon Rd.	70.8	71.8	1.0	No
	Carbon Canyon Rd. to Peyton Dr.	74.3	75.7	1.4	No
	Peyton Dr. to SR-71	72.8	74.1	1.3	No
Woodview Road	East of Peyton Dr.	61.2	63.5	2.4	No
Pipeline Avenue	Woodview Rd. to Pebble Beach Ln.	65.9	67.2	1.3	No
	Pebble Beach Ln. to Soquel Canyon Pkwy.	65.8	67.1	1.3	No
SR-71	City Limits to Grand Ave.	78.1	79.6	1.5	No
	Grand Ave to Chino Hills Pkwy.	78.4	79.8	1.5	No
	Chino Hills Pkwy. to City Limits	77.6	79.1	1.5	No
Pomona Freeway	City Limits	82.7	84.2	1.5	No
Chino Ave.	Chino Hills Pkwy. to Peyton Dr.	67.3	68.8	1.4	No
	Peyton Dr. to SR-71	70.7	72.0	1.3	No
Eucalyptus Ave.	Peyton Dr. to SR-71	68.5	69.7	1.2	No
	Chino Hills Pkwy. to Peyton Dr.	67.6	69.0	1.4	No
Soquel Canyon Pkwy	Pipeline Ave to Elinvar Dr	71.1	72.7	1.6	No
	Elinvar Dr to Butterfield Ranch Rd	72.0	73.2	1.2	No
	Butterfield Rance Rd to SR-71	75.4	76.4	1.0	No
*Calculated @ 100'					

With Project Scenario

Year 2023 and Year 2040 plus Project and the resulting increase with the project are shown in Table 7. Table ~~6~~ shows that traffic noise increases with~~out~~ the project from 2023 to 2040 with the project would be up to 2.7 dBA CNEL. There are no segments that would increase greater than 3 dB, which is a perceptible change in noise level. The impact is therefore less than significant.

Table 7: Traffic Noise Increases – 2040 with Project (dBA CNEL)

ROADWAY	SEGMENT LIMITS	Year 2023 Level at 50 ft.	Year 2040 Level at 50 ft.	Increase with Project	Potentially Significant?
Grand Avenue	Peyton Dr. to SR-71	75.2	76.4	1.2	No
	Chino Hills Pkwy. to Peyton Dr.	71.1	72.7	1.6	No
Boys Republic Drive	South of Shoppes Dr.	66.8	68.5	1.6	No
Peyton Drive	North of Chino Ave.	74.2	75.2	0.9	No
	Chino Ave. to Grand Ave.	73.0	74.0	1.0	No
	Grand Ave. to Eucalyptus Ave.	72.8	73.7	0.9	No
	Eucalyptus Ave. to Chino Hills Pkwy.	71.7	72.8	1.1	No
	Chino Hills Pkwy to Woodview Rd.	65.3	67.5	2.2	No
Carbon Canyon Road	South of Chino Hills Pkwy.	71.7	74.0	2.3	No
	South of Feldspar Dr.	70.6	73.3	2.7	No
Chino Hills Parkway	Eucalyptus Ave to Carbon Canyon Rd.	70.8	72.0	1.2	No
	Carbon Canyon Rd. to Peyton Dr.	74.3	76.1	1.7	No
	Peyton Dr. to SR-71	72.8	74.2	1.3	No
Woodview Road	East of Peyton Dr.	61.2	62.9	1.8	No
Pipeline Avenue	Woodview Rd. to Pebble Beach Ln.	65.9	66.9	1.0	No
	Pebble Beach Ln. to Soquel Canyon Pkwy.	65.8	66.3	0.6	No
SR-71	City Limits to Grand Ave.	78.1	79.7	1.6	No
	Grand Ave to Chino Hills Pkwy.	78.4	79.9	1.6	No
	Chino Hills Pkwy. to City Limits	77.6	79.2	1.6	No
Pomona Freeway	City Limits	82.7	84.2	1.5	No
Chino Ave.	Chino Hills Pkwy. to Peyton Dr.	67.3	68.8	1.4	No
	Peyton Dr. to SR-71	70.7	72.0	1.3	No
Eucalyptus Ave.	Peyton Dr. to SR-71	68.5	69.7	1.2	No
	Chino Hills Pkwy. to Peyton Dr.	67.6	69.0	1.4	No
Soquel Canyon Pkwy	Pipeline Ave to Elinvar Dr	71.1	73.6	2.5	No
	Elinvar Dr to Butterfield Ranch Rd	72.0	73.8	1.8	No
	Butterfield Rance Rd to SR-71	75.4	76.7	1.4	No

*Calculated @ 100'

7.2 On-Site Traffic Noise Impacts

Year 2040 with Project traffic noise contours are presented in Table 8. These contours can be utilized to evaluate the Project's compatibility with the future noise environment.

Potential Lower Income RHNA sites 1, 2, 4, and 11 all have the potential to fall outside of the recommended 65 dBA CNEL without mitigation. Care should be taken to ensure that exterior levels are

mitigated to 65 dBA CNEL the extent feasible, and all interior levels in inhabited areas must be 45 dBA CNEL or less.

Table 8: Future Traffic Noise Contours (dBA, CNEL)

ROADWAY	SEGMENT	DAILY TRAFFIC VOLUMES	NOISE LEVEL AT 50 FT. (dBA CNEL)	DISTANCE TO NOISE CONTOUR (FT.)			
				70 dBA CNEL	65 dBA CNEL	60 dBA CNEL	55 dBA CNEL
Grand Avenue	Peyton Dr. to SR-71	36,752	76.4	133	287	618	1331
	Chino Hills Pkwy. to Peyton Dr.	27,100	72.7	75	162	350	754
Boys Republic Drive	South of Shoppes Dr.	20,130	68.5	40	85	183	395
Peyton Drive	North of Chino Ave.	27,900	75.2	111	239	514	1108
	Chino Ave. to Grand Ave.	24,800	74.0	93	200	431	929
	Grand Ave. to Eucalyptus Ave.	23,100	73.7	89	191	411	886
	Eucalyptus Ave. to Chino Hills Pkwy.	27,817	72.8	77	165	356	767
	Chino Hills Pkwy to Woodview Rd.	7,839	67.5	34	74	159	342
Carbon Canyon Rd	South of Chino Hills Pkwy.	35,699	74.0	93	200	431	929
	South of Feldspar Dr.	30,400	73.3	83	180	387	834
Chino Hills Parkway	Eucalyptus Ave to Carbon Canyon Rd.	22,100	72.0	68	147	317	682
	Carbon Canyon Rd. to Peyton Dr.	43,947	76.1	127	273	588	1267
	Peyton Dr. to SR-71	38,301	74.2	95	205	441	949
Woodview Road	East of Peyton Dr.	6,128	62.9	17	36	78	169
Pipeline Avenue	Woodview Rd. to Pebble Beach Ln.	11,256	66.9	31	67	144	311
	Pebble Beach Ln. to Soquel Canyon Pkwy.	9,836	66.3	28	61	132	284
SR-71	City Limits to Grand Ave.	127,801	79.7	443	955	2058	4433
	Grand Ave to Chino Hills Pkwy.	159,301	79.9	459	989	2131	4592
	Chino Hills Pkwy. to City Limits	135,501	79.2	412	888	1913	4122
Pomona Freeway	City Limits	309,101	84.2	891	1919	4135	8909
Chino Ave.	Chino Hills Pkwy. to Peyton Dr.	11,000	68.8	41	89	192	413
	Peyton Dr. to SR-71	16,400	72.0	68	147	317	683
Eucalyptus Ave.	Peyton Dr. to SR-71	16,100	69.7	48	103	222	478
	Chino Hills Pkwy. to Peyton Dr.	14,100	69.0	43	93	201	432
Soquel Canyon Pkwy	Pipeline Ave to Elinvar Dr	13,700	73.6	87	188	404	871
	Elinvar Dr to Butterfield Ranch Rd	19,000	73.8	90	194	417	899
	Butterfield Rance Rd to SR-71	28,200	76.7	141	304	654	1409

Exhibit F

Existing Roadway Noise Level Contours (CNEL)

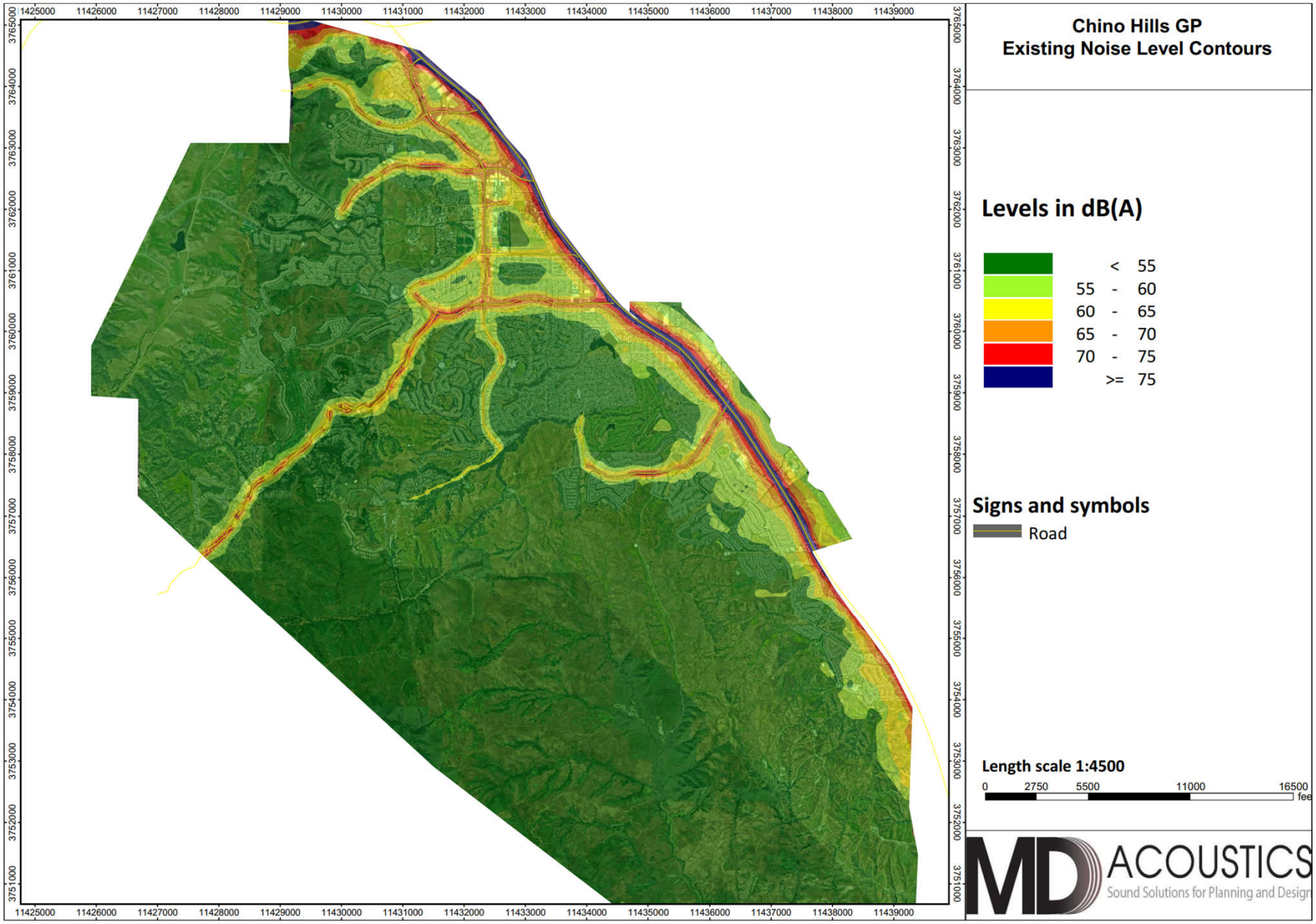


Exhibit G

2040 Roadway Noise Level Contours (CNEL)

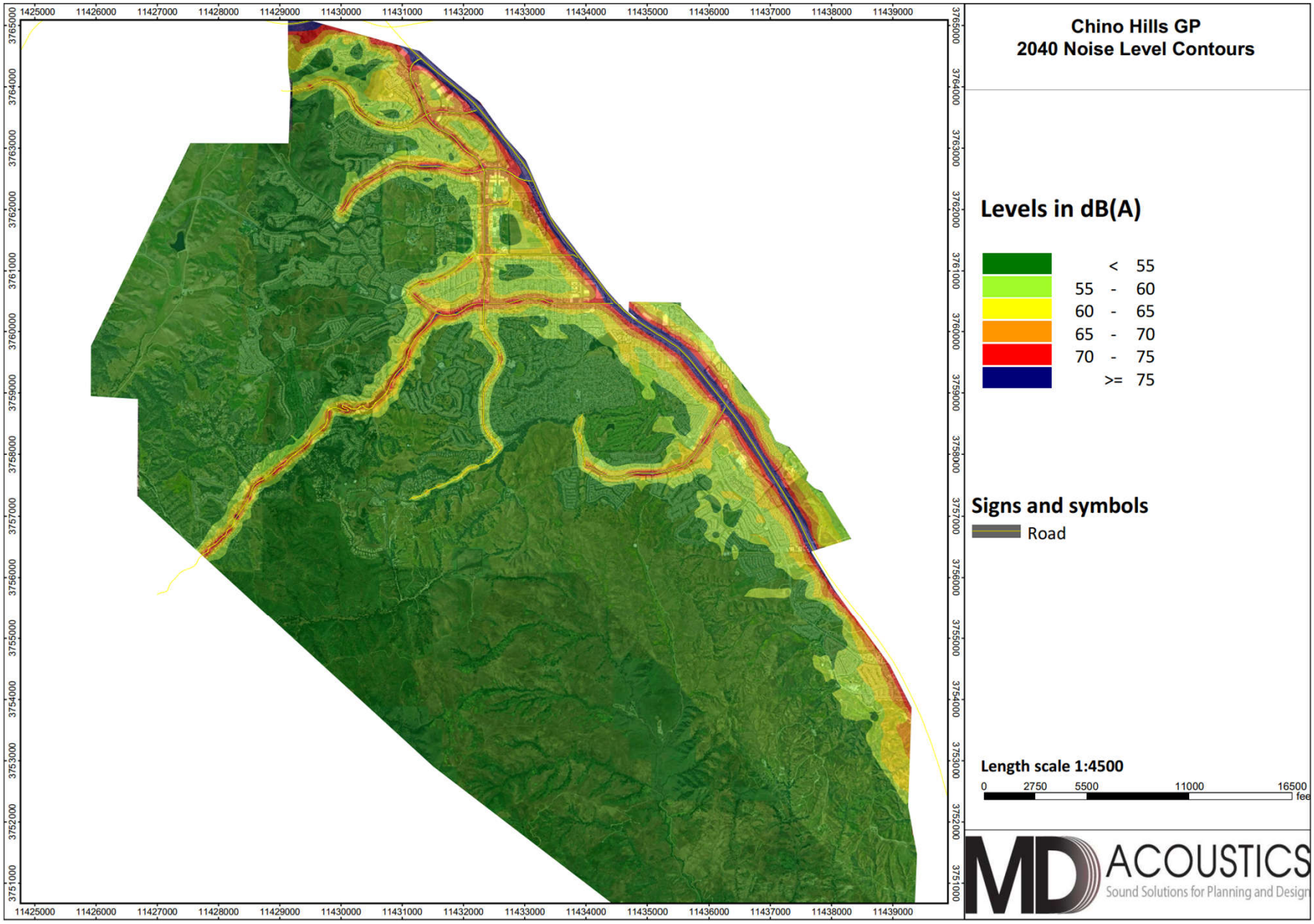
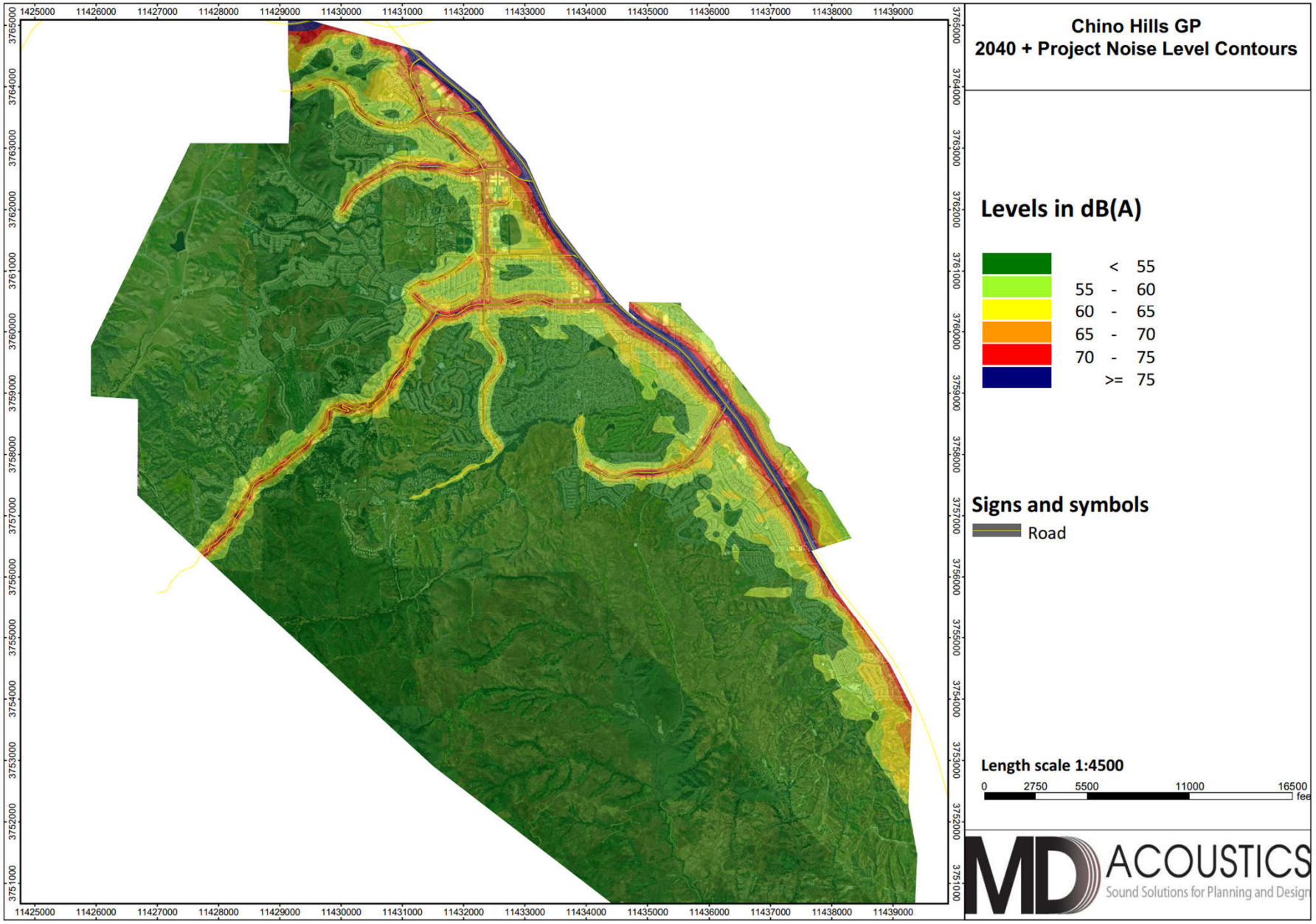


Exhibit H

2040 Plus Plan Roadway Noise Level Contours (CNEL)



8.0 Construction Noise and Vibration Impacts

The degree of construction noise may vary for different areas of the project site and vary depending on the construction activities. This section summarizes discusses noise and ground-borne vibration modeling efforts, impact analysis, and mitigation, if necessary.

8.1 Construction Noise

Construction noise is exempt from the City's noise limits between the hours of 7 AM and 7 PM Monday through Friday and 8 AM to 6 PM on Saturdays. Construction noise is not exempt on Sundays or federal holidays. and holidays.

Typical construction equipment noise levels are presented in Table 9.

Table 9: Typical Construction Equipment Noise Levels

Equipment	Typical Noise Level (dBA at 50 feet)	Equipment	Typical Noise Level (dBA at 50 feet)
Air Compressor	80	Paver	85
Backhoe	80	Pile-driver (Impact)	101
Ballast Equalizer	82	Piler-driver (Sonic)	95
Ballast Tamper	83	Pneumatic Tool	85
Compactor	82	Pump	77
Concrete Mixer	85	Rail Saw	90
Concrete Pump	82	Rock Drill	95
Concrete Vibrator	76	Roller	85
Crane, Derrick	88	Saw	76
Crane, Mobile	83	Scarifier	83
Dozer	85	Scraper	85
Generator	82	Shovel	82
Grader	85	Spike Driver	77
Impact Wrench	85	Tie Cutter	84
Jack Hammer	88	Tie Inserter	85
Loader	80	Truck	84
Source: Transit Noise and Vibration Impact Assessment, Federal Transit Administration, 2018.			

The loudest expected piece of equipment for the Plan is 85 dBA at 50 feet (concrete mixer, dozer, grader, paver, etc.). Given a usage factor of 50% per the Federal Highway Road Noise Construction Model, the maximum Leq level for one piece of equipment is 82 dBA at 50 feet. In the likely scenario that two pieces of equipment are operating simultaneously 50 feet from the same point on the property line, the overall level would be 85 dBA, Leq.

To minimize construction noise at adjacent land uses, the following noise reduction policies should be taken when construction occurs within 500 feet of sensitive receptors:

1. Require that construction vehicles and equipment (fixed or mobile) be equipped with properly operating and maintained mufflers.

2. Restrict haul routes and construction-related traffic.

3. Place stock piling and/or vehicle-staging areas as far as practical from residential uses.

4. Reduce nonessential idling of construction equipment.

5. Consider the installation of temporary sound barriers for construction activities that are adjacent to occupied noise-sensitive structures, depending on length of construction, type of equipment used, and proximity to noise-sensitive uses.

6. Secure loads to reduce rattling and banging.

Noise reduction measure 5 should be considered when construction activity with multiple pieces of equipment occurs within 50 feet of a sensitive property line. Barriers should block the line-of-site to noise-sensitive structures.

With the noise reduction measures, the impact is less than significant.

8.2 Construction Vibration

Construction activities can produce vibration that may be felt by adjacent land uses. The construction of the proposed project would not require the use of equipment such as pile drivers, which are known to generate substantial construction vibration levels. The primary vibration source during construction may be from a bulldozer. A large bulldozer has a vibration impact of 0.089 inches per second peak particle velocity (PPV) at 25 feet which is perceptible but below any risk to architectural damage.

The fundamental equation used to calculate vibration propagation through average soil conditions and distance is as follows:

$$PPV_{equipment} = PPV_{ref} (25/D_{rec})^n$$

Where: PPV_{ref} = reference PPV at 25 ft.
D_{rec} = distance from equipment to receiver in ft.
n = 1.5 (the value related to the attenuation rate through ground)

The thresholds from the Caltrans Transportation and Construction Induced Vibration Guidance Manual in Table 10 (below) provides general thresholds and guidelines as to the vibration damage potential from vibratory impacts.

Table 10: Guideline Vibration Damage Potential Threshold Criteria

Structure and Condition	Maximum PPV (in/sec)	
	Transient Sources	Continuous/Frequent Intermittent Sources
Extremely fragile historic buildings, ruins, ancient monuments	0.12	0.08
Fragile buildings	0.2	0.1
Historic and some old buildings	0.5	0.25
Older residential structures	0.5	0.3
New residential structures	1.0	0.5
Modern industrial/commercial buildings	2.0	0.5

Source: Table 19, Transportation and Construction Vibration Guidance Manual, Caltrans, Sept. 2013.
Note: Transient sources create a single isolated vibration event, such as blasting or drop balls. Continuous/frequent intermittent sources include impact pile drivers, pogo-stick compactors, crack-and-seat equipment, vibratory pile drivers, and vibratory compaction equipment.

Table 11 gives approximate vibration levels for particular construction activities. This data provides a reasonable estimate for a wide range of soil conditions.

Table 11: Vibration Source Levels for Construction Equipment

Equipment	Peak Particle Velocity (inches/second) at 25 feet	Approximate Vibration Level LV (dVB) at 25 feet
Pile driver (impact)	1.518 (upper range)	112
	0.644 (typical)	104
Pile driver (sonic)	0.734 upper range	105
	0.170 typical	93
Clam shovel drop (slurry wall)	0.202	94
Hydromill	0.008 in soil	66
(slurry wall)	0.017 in rock	75
Vibratory Roller	0.21	94
Hoe Ram	0.089	87
Large bulldozer	0.089	87
Caisson drill	0.089	87
Loaded trucks	0.076	86
Jackhammer	0.035	79
Small bulldozer	0.003	58

RMS velocity in decibels, VdB re 1 micro-in/sec
Source: Transit Noise and Vibration Impact Assessment, Federal Transit Administration, 2018.

To avoid structural damage, bulldozers should not come within 15 feet of fragile buildings or within 8 feet of older residential structures and historic buildings. Daytime residential annoyance, defined by the FTA as 78 VdB, would occur at 50 feet from a bulldozer.

Construction activity is not anticipated to be vibration-intensive including the use of blasting, pile driving, and vibratory rollers within 200 feet of sensitive receptors. Construction activity is not expected to fall within the limits of structural damage and therefore the impact is less than significant.

9.0 CEQA Analysis

The California Environmental Quality Act Guidelines (Appendix G) establishes thresholds for noise impact analysis as presented below:

(a) Would the project result in the generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise Code, or applicable standards of other agencies?

Transportation Noise Impacts

The significance criteria for Transportation Noise Standards are based on audibly perceived differences in the traffic noise level. Compared to the existing traffic noise levels, if the future (2040) plus project levels are expected to increase by more than 3 dB AND exceed the 65 dBA CNEL exterior noise compatibility level for residences, lodging, parks, hospitals, and schools.

Compared to existing traffic noise levels, future (2040) traffic volumes are expected to be up to 2.7 dBA CNEL louder than existing ambient noise levels at existing land uses (see Table 6). No roadways are expected to be more than a 3 dB increase AND exceed the 65 dBA CNEL exterior noise compatibility level for sensitive outdoor uses. The impact is therefore less than significant.

Future residential uses are anticipated to be built within the 65 dBA CNEL contours. These projects will require a detailed noise analysis to mitigate the outdoor levels to 65 dBA CNEL to the extent feasible. The interior noise levels must be mitigated to 45 dBA CNEL in habitable rooms.

Stationary Noise Sources

Stationary noise impacts would be considered significant if they result in exceedances of Chapter 16.48 of the municipal code.

Implementation of the proposed General Plan Update may result in stationary noise impacts related to HVAC Systems, Generators, Fans, Air Compressors, and Transformers. This list is not intended to be exclusive. Implementation of good land use planning and policies and actions will minimize noise impacts related to these sources by avoiding the placement of noise generating equipment near noise-sensitive land uses and where unavoidable, include design measures to the degree practicable to avoid violating Chapter 16.48 of the municipal code. Individual projects are required to follow these regulations. Stationary noise impacts will therefore be less than significant with mitigation.

Construction Noise and Vibration

Construction noise will be significant if construction activities occur outside of the permitted construction hours specified in Section 8.08.020 of the Chino Hills.

Implementation of the construction noise reduction policies would result in short-term noise impacts associated with construction activities. Two types of short-term noise impacts could occur during construction activities, on-site and off-site.

Construction crew commute, and the transport of construction equipment and materials to the site for the proposed project would incrementally increase noise levels on access roads leading to the site. Truck traffic associated with project construction should be limited to within the permitted construction hours, as listed in the City's Municipal Code. Although there would be a relatively high single-event noise exposure potential at a maximum of 87 dBA Lmax at 50 ft from passing trucks, causing possible short-term intermittent annoyances, the effect on ambient noise levels would be less than 1 dBA when averaged over one hour or 24 hours. In other words, the changes in noise levels over 1 hour or 24 hours attributable to passing trucks would not be perceptible to the normal human ear. Therefore, short-term construction-related impacts associated with worker commute and equipment transport on local streets leading to the project site would result in a less than significant impact on noise-sensitive receptors along the access routes. No mitigation is required.

The site preparation phase of on-site construction activities, which includes grading and paving, tends to generate the highest noise levels since the noisiest construction equipment is earthmoving equipment. Earthmoving equipment includes excavating machinery such as backhoes, bulldozers, and front loaders. Earthmoving and compacting equipment includes compactors, scrapers, and graders. Typical operating cycles for these types of construction equipment may involve 1 or 2 minutes of full power operation followed by 3 or 4 minutes at lower power settings. Site-specific construction activities associated with future development is expected to require the use of scrapers, bulldozers, motor graders, and water and pickup trucks. The loudest expected piece of equipment for the Plan is 85 dBA at 50 feet (concrete mixer, dozer, grader, paver, etc.). Given a usage factor of 50% per the Federal Highway Road Noise Construction Model, the maximum Leq level for one piece of equipment is 82 dBA at 50 feet. In the likely scenario that two pieces of equipment are operating simultaneously 50 feet from the same point on the property line, the overall level would be 85 dBA, Leq.

b) Generate excessive ground-borne vibration or ground-borne noise levels?
Construction vibration will be significant if vibration exceeds levels that would result in structural damage to existing buildings. Implementation of the proposed General Update would result in short-term vibration impacts associated with construction activities. The Transportation and Construction Vibration Guidance Manual (Caltrans 2020) has recommended vibration thresholds for various types of receivers.

To avoid structural damage, bulldozers should not come within 15 feet of fragile buildings or within 8 feet of older residential structures and historic buildings. Daytime residential annoyance, defined by the FTA as 78 VdB, would occur at 50 feet from a bulldozer.

Construction activity is not anticipated to be vibration-intensive including the use of blasting, pile driving, and vibratory rollers within 200 feet of sensitive receptors. Construction activity is not expected to fall within the limits of structural damage and therefore the impact is less than significant ~~with mitigation~~.

c) For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?

There are no airports located within the Study Area. The closest airport to the Study Area is the Chino Airport located approximately 2 miles east of the Study Area. The city limits are outside of the 2028 55 dBA CNEL contours of the Chino Airport per the Chino Airport Master Plan (Feb 2006). The impact is therefore less than significant.

10.0 References

American National Standards Institute (ANSI)

Specifications for sound level meters (S1.4-1983 identified in Chapter 19.68.020.AA).

California, State of, Building Standards Commission

2019 California Uniform Building Code (UBC), Title 24.
2019 Green Code Section 5.507.4.3 (2019)

California Department of Transportation (Caltrans)

2013 Technical Noise Supplement to the Traffic Noise Analysis Protocol.
2020 Transportation and Construction Vibration Guidance Manual. April.
2021 Caltrans Traffic Counts https://dot.ca.gov/programs/traffic-operations/census

California Office of Noise Control

2017 Guidelines for the Preparation and Content of Noise Elements of the General Plan. February.

Chino Hills, City of

2015 City of Chino Hills General Plan.
City of Chino Hills Code of Ordinances

Environmental Protection Agency (EPA)

1974 Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety. Prepared by the EPA, Office of Noise Abatement and Control.

Federal Interagency Committee on Noise

1992 Federal Agency Review of Selected Airport Noise Analysis Issues. August.

Federal Transit Administration

2006 Transit Noise and Vibration Impact Assessment. Typical Construction Equipment Vibration Emissions. FTAVA-90-1003-06.

Office of Planning and Research, State of California

2017 Office of Planning and Research, General Plan Guidelines.

San Bernardino, County of

2006 Chino Airport Master Plan

Appendix A:

Field Measurement Data

Appendix B:
Traffic FHWA Worksheets

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268
counts@countsunlimited.com

City of Chino Hills
N/S: Peyton Drive
E/W: Woodview Road
Weather: Clear

File Name : 06_CHH_Peyton_Woodview_AM
Site Code : 05722517
Start Date : 5/24/2022
Page No : 1

Groups Printed- 3 Axle Vehicles

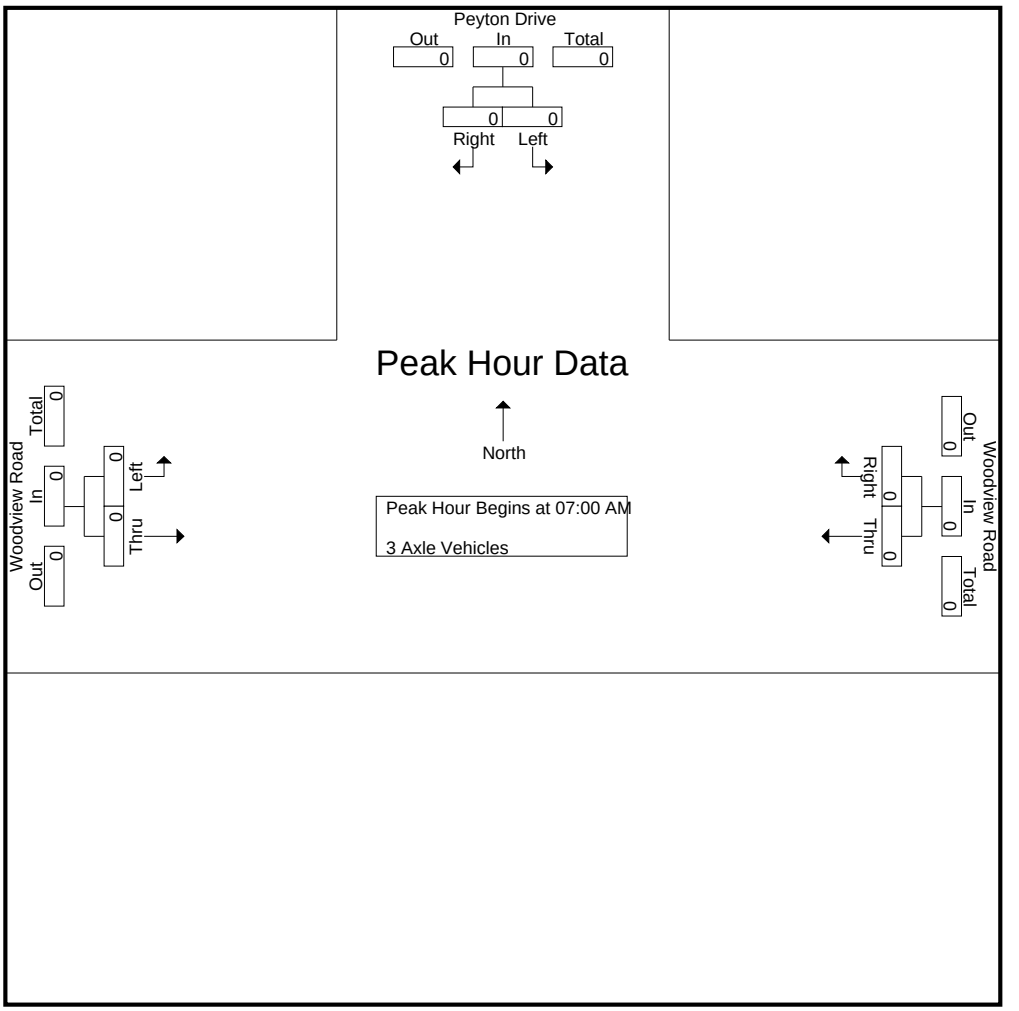
	Peyton Drive Southbound			Woodview Road Westbound			Woodview Road Eastbound			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0
08:00 AM	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0
Apprch %	0	0		0	0		0	0		
Total %										

	Peyton Drive Southbound			Woodview Road Westbound			Woodview Road Eastbound			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 07:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:00 AM										
07:00 AM	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0		0	0		0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268
counts@countsunlimited.com

City of Chino Hills
N/S: Peyton Drive
E/W: Woodview Road
Weather: Clear

File Name : 06_CHH_Peyton_Woodview_AM
Site Code : 05722517
Start Date : 5/24/2022
Page No : 2



Peak Hour Analysis From 07:00 AM to 07:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:00 AM			07:00 AM			07:00 AM		
+0 mins.	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0
% App. Total	0	0		0	0		0	0	
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268
counts@countsunlimited.com

City of Chino Hills
N/S: Peyton Drive
E/W: Woodview Road
Weather: Clear

File Name : 06_CHH_Peyton_Woodview_AM
Site Code : 05722517
Start Date : 5/24/2022
Page No : 1

Groups Printed- 4+ Axle Trucks

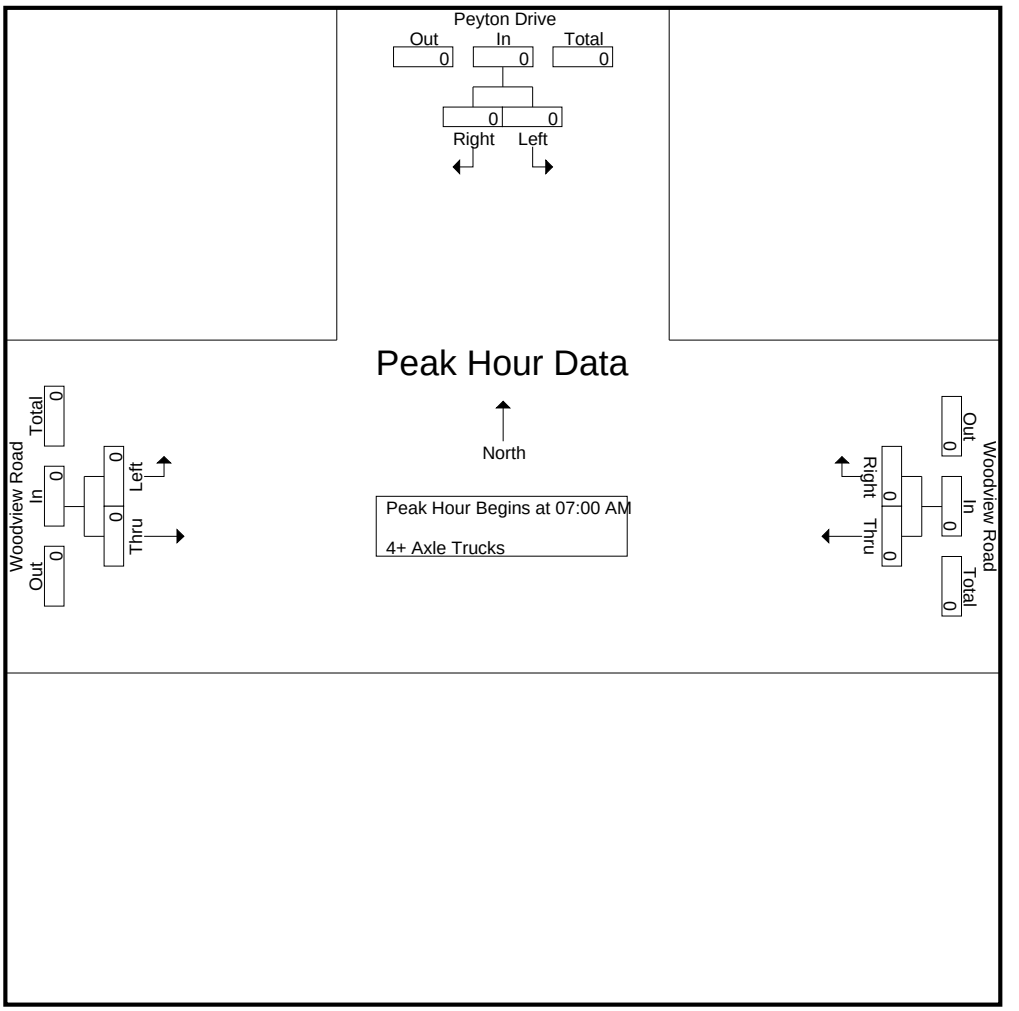
	Peyton Drive Southbound			Woodview Road Westbound			Woodview Road Eastbound			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0
08:00 AM	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	1	1	0	0	0	1
08:30 AM	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	1	1	0	0	0	1
Grand Total	0	0	0	0	1	1	0	0	0	1
Apprch %	0	0		0	100		0	0		
Total %	0	0	0	0	100	100	0	0	0	

	Peyton Drive Southbound			Woodview Road Westbound			Woodview Road Eastbound			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 07:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:00 AM										
07:00 AM	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0		0	0		0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268
counts@countsunlimited.com

City of Chino Hills
N/S: Peyton Drive
E/W: Woodview Road
Weather: Clear

File Name : 06_CHH_Peyton_Woodview_AM
Site Code : 05722517
Start Date : 5/24/2022
Page No : 2



Peak Hour Analysis From 07:00 AM to 07:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:00 AM			07:00 AM			07:00 AM		
+0 mins.	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0
% App. Total	0	0		0	0		0	0	
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268
counts@countsunlimited.com

City of Chino Hills
N/S: Peyton Drive
E/W: Woodview Road
Weather: Clear

File Name : 06_CHH_Peyton_Woodview_PM
Site Code : 05722517
Start Date : 5/24/2022
Page No : 1

Groups Printed- Passenger Vehicles - Large 2 Axle Vehicles - 3 Axle Vehicles - 4+ Axle Trucks

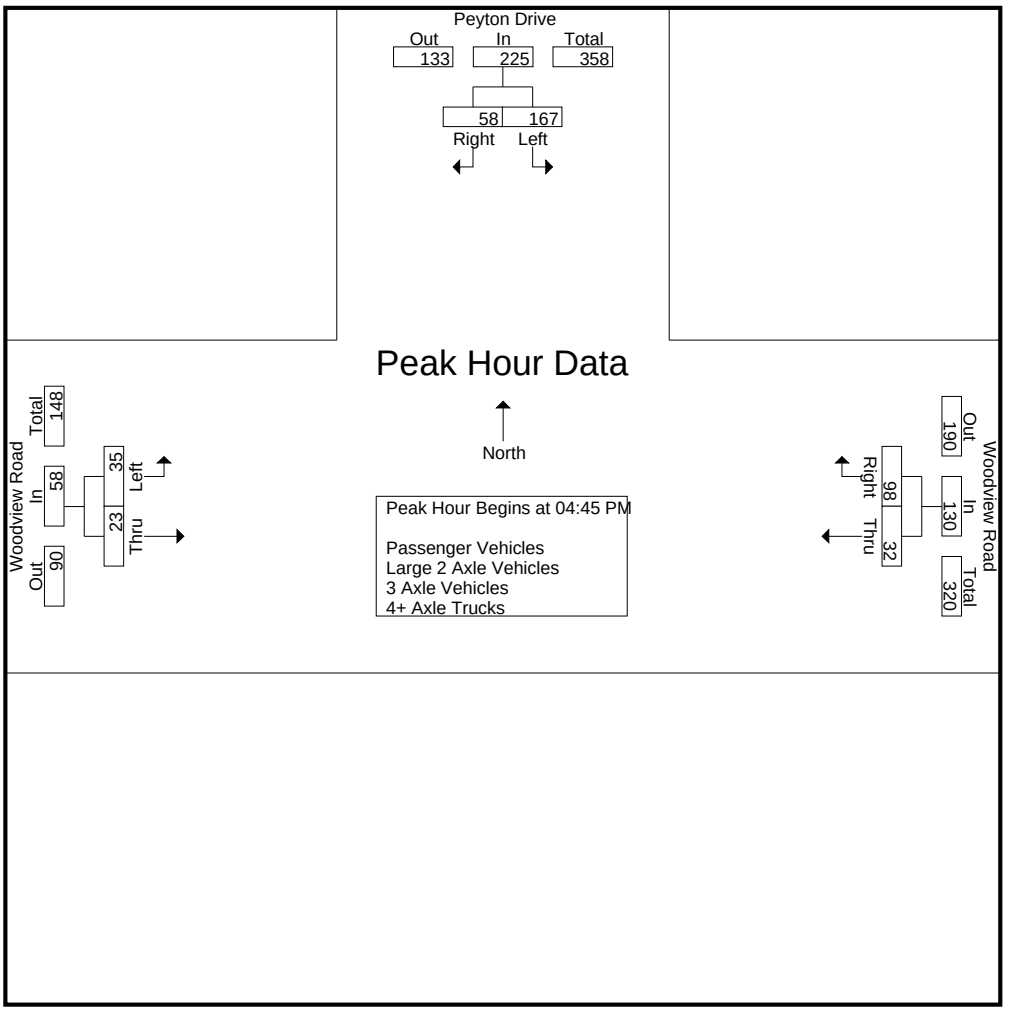
	Peyton Drive Southbound			Woodview Road Westbound			Woodview Road Eastbound			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total
04:00 PM	32	13	45	7	17	24	10	2	12	81
04:15 PM	29	10	39	5	20	25	11	7	18	82
04:30 PM	39	13	52	5	22	27	10	13	23	102
04:45 PM	42	8	50	11	26	37	10	4	14	101
Total	142	44	186	28	85	113	41	26	67	366
05:00 PM	40	9	49	4	24	28	9	9	18	95
05:15 PM	45	17	62	9	23	32	5	5	10	104
05:30 PM	40	24	64	8	25	33	11	5	16	113
05:45 PM	33	20	53	6	23	29	4	6	10	92
Total	158	70	228	27	95	122	29	25	54	404
Grand Total	300	114	414	55	180	235	70	51	121	770
Apprch %	72.5	27.5		23.4	76.6		57.9	42.1		
Total %	39	14.8	53.8	7.1	23.4	30.5	9.1	6.6	15.7	
Passenger Vehicles	300	114	414	55	180	235	69	51	120	769
% Passenger Vehicles	100	100	100	100	100	100	98.6	100	99.2	99.9
Large 2 Axle Vehicles	0	0	0	0	0	0	1	0	1	1
% Large 2 Axle Vehicles	0	0	0	0	0	0	1.4	0	0.8	0.1
3 Axle Vehicles	0	0	0	0	0	0	0	0	0	0
% 3 Axle Vehicles	0	0	0	0	0	0	0	0	0	0
4+ Axle Trucks	0	0	0	0	0	0	0	0	0	0
% 4+ Axle Trucks	0	0	0	0	0	0	0	0	0	0

	Peyton Drive Southbound			Woodview Road Westbound			Woodview Road Eastbound			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:45 PM										
04:45 PM	42	8	50	**11**	**26**	**37**	10	4	14	101
05:00 PM	40	9	49	4	24	28	9	**9**	**18**	95
05:15 PM	**45**	17	62	9	23	32	5	5	10	104
05:30 PM	40	**24**	**64**	8	25	33	**11**	5	16	**113**
Total Volume	167	58	225	32	98	130	35	23	58	413
% App. Total	74.2	25.8		24.6	75.4		60.3	39.7		
PHF	.928	.604	.879	.727	.942	.878	.795	.639	.806	.914

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268
counts@countsunlimited.com

City of Chino Hills
N/S: Peyton Drive
E/W: Woodview Road
Weather: Clear

File Name : 06_CHH_Peyton_Woodview_PM
Site Code : 05722517
Start Date : 5/24/2022
Page No : 2



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	05:00 PM			04:45 PM			04:15 PM		
+0 mins.	40	9	49	**11**	**26**	**37**	**11**	7	18
+15 mins.	**45**	17	62	4	24	28	10	**13**	**23**
+30 mins.	40	**24**	**64**	9	23	32	10	4	14
+45 mins.	33	20	53	8	25	33	9	9	18
Total Volume	158	70	228	32	98	130	40	33	73
% App. Total	69.3	30.7		24.6	75.4		54.8	45.2	
PHF	.878	.729	.891	.727	.942	.878	.909	.635	.793

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268
counts@countsunlimited.com

City of Chino Hills
N/S: Peyton Drive
E/W: Woodview Road
Weather: Clear

File Name : 06_CHH_Peyton_Woodview_PM
Site Code : 05722517
Start Date : 5/24/2022
Page No : 1

Groups Printed- Passenger Vehicles

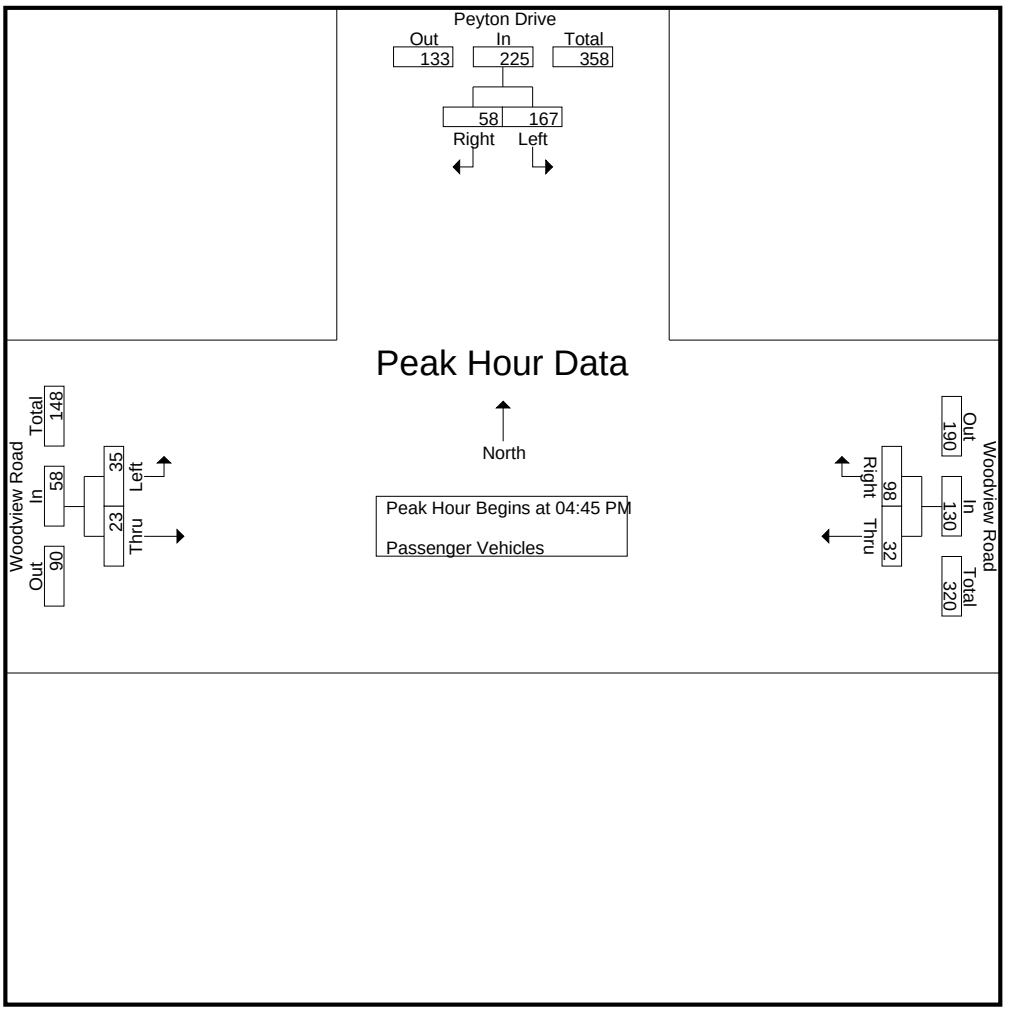
	Peyton Drive Southbound			Woodview Road Westbound			Woodview Road Eastbound			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total
04:00 PM	32	13	45	7	17	24	9	2	11	80
04:15 PM	29	10	39	5	20	25	11	7	18	82
04:30 PM	39	13	52	5	22	27	10	13	23	102
04:45 PM	42	8	50	11	26	37	10	4	14	101
Total	142	44	186	28	85	113	40	26	66	365
05:00 PM	40	9	49	4	24	28	9	9	18	95
05:15 PM	45	17	62	9	23	32	5	5	10	104
05:30 PM	40	24	64	8	25	33	11	5	16	113
05:45 PM	33	20	53	6	23	29	4	6	10	92
Total	158	70	228	27	95	122	29	25	54	404
Grand Total	300	114	414	55	180	235	69	51	120	769
Apprch %	72.5	27.5		23.4	76.6		57.5	42.5		
Total %	39	14.8	53.8	7.2	23.4	30.6	9	6.6	15.6	

	Peyton Drive Southbound			Woodview Road Westbound			Woodview Road Eastbound			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total
Peak Hour Analysis From 04:45 PM to 05:30 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:45 PM										
04:45 PM	42	8	50	**11**	**26**	**37**	10	4	14	101
05:00 PM	40	9	49	4	24	28	9	**9**	**18**	95
05:15 PM	**45**	17	62	9	23	32	5	5	10	104
05:30 PM	40	**24**	**64**	8	25	33	**11**	5	16	**113**
Total Volume	167	58	225	32	98	130	35	23	58	413
% App. Total	74.2	25.8		24.6	75.4		60.3	39.7		
PHF	.928	.604	.879	.727	.942	.878	.795	.639	.806	.914

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268
counts@countsunlimited.com

City of Chino Hills
N/S: Peyton Drive
E/W: Woodview Road
Weather: Clear

File Name : 06_CHH_Peyton_Woodview_PM
Site Code : 05722517
Start Date : 5/24/2022
Page No : 2



Peak Hour Analysis From 04:45 PM to 05:30 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:45 PM			04:45 PM			04:45 PM		
+0 mins.	42	8	50	**11**	**26**	**37**	10	4	14
+15 mins.	40	9	49	4	24	28	9	**9**	**18**
+30 mins.	**45**	17	62	9	23	32	5	5	10
+45 mins.	40	**24**	**64**	8	25	33	**11**	5	16
Total Volume	167	58	225	32	98	130	35	23	58
% App. Total	74.2	25.8		24.6	75.4		60.3	39.7	
PHF	.928	.604	.879	.727	.942	.878	.795	.639	.806

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268
counts@countsunlimited.com

City of Chino Hills
N/S: Peyton Drive
E/W: Woodview Road
Weather: Clear

File Name : 06_CHH_Peyton_Woodview_PM
Site Code : 05722517
Start Date : 5/24/2022
Page No : 1

Groups Printed- Large 2 Axle Vehicles

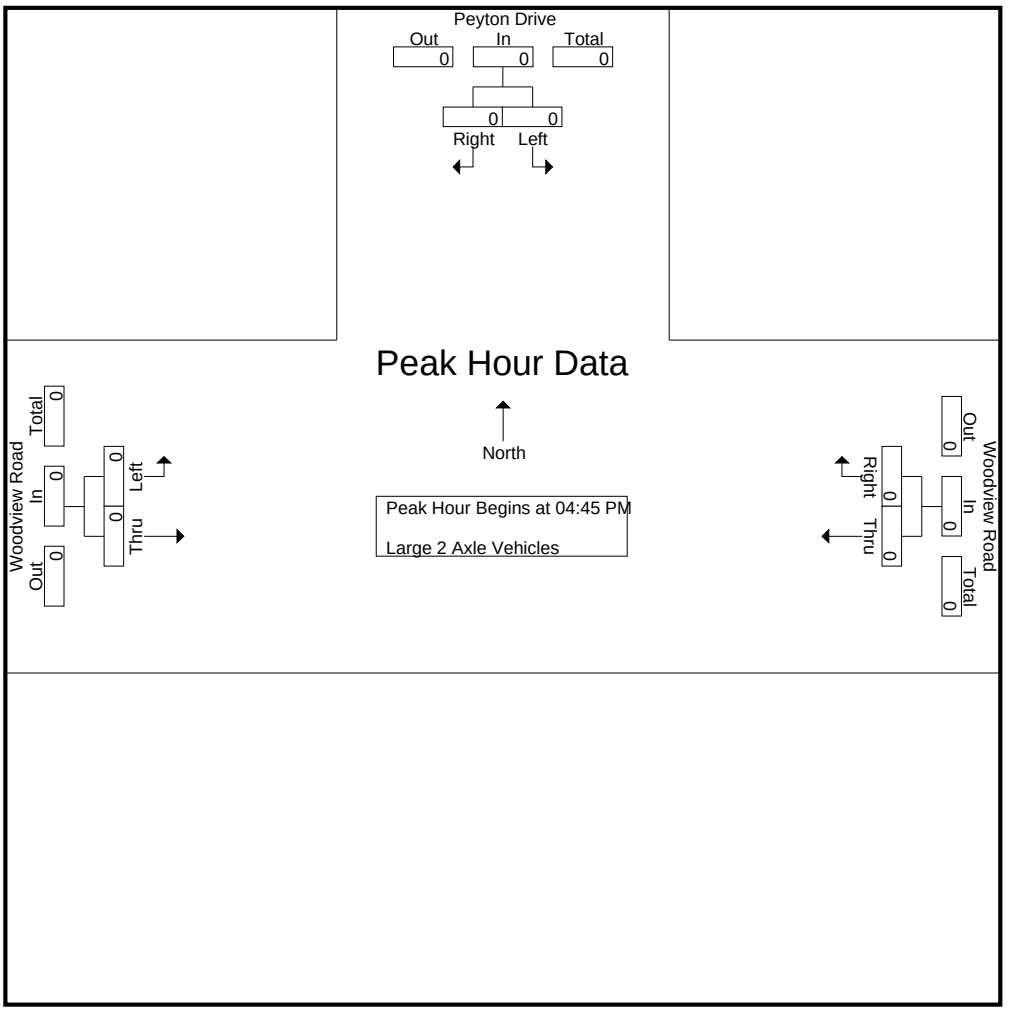
	Peyton Drive Southbound			Woodview Road Westbound			Woodview Road Eastbound			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total
04:00 PM	0	0	0	0	0	0	1	0	1	1
04:15 PM	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	1	0	1	1
05:00 PM	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	1	0	1	1
Apprch %	0	0		0	0		100	0		
Total %	0	0	0	0	0	0	100	0	100	

	Peyton Drive Southbound			Woodview Road Westbound			Woodview Road Eastbound			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total
Peak Hour Analysis From 04:45 PM to 05:30 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:45 PM										
04:45 PM	0	0	0	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0		0	0		0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268
counts@countsunlimited.com

City of Chino Hills
N/S: Peyton Drive
E/W: Woodview Road
Weather: Clear

File Name : 06_CHH_Peyton_Woodview_PM
Site Code : 05722517
Start Date : 5/24/2022
Page No : 2



Peak Hour Analysis From 04:45 PM to 05:30 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:45 PM			04:45 PM			04:45 PM		
+0 mins.	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0
% App. Total	0	0		0	0		0	0	
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268
counts@countsunlimited.com

City of Chino Hills
N/S: Peyton Drive
E/W: Woodview Road
Weather: Clear

File Name : 06_CHH_Peyton_Woodview_PM
Site Code : 05722517
Start Date : 5/24/2022
Page No : 1

Groups Printed- 3 Axle Vehicles

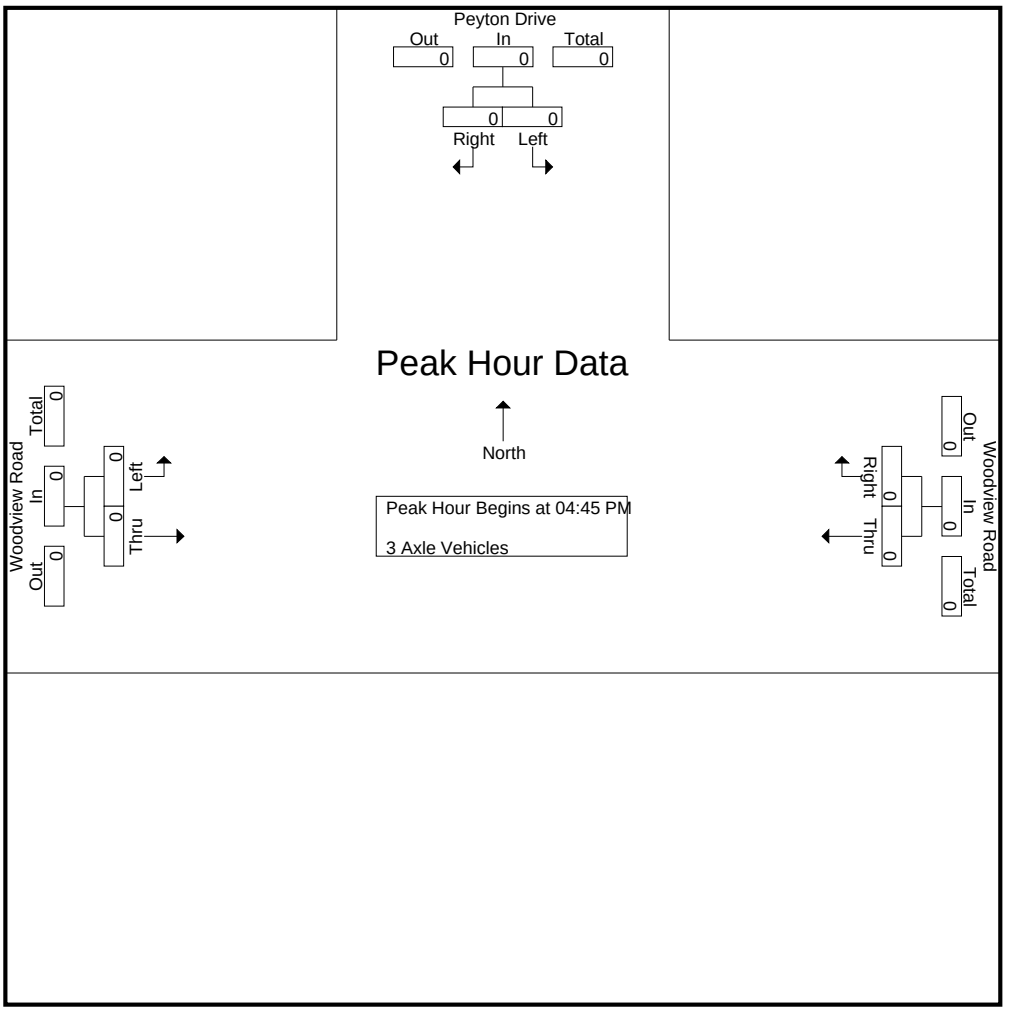
	Peyton Drive Southbound			Woodview Road Westbound			Woodview Road Eastbound			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total
04:00 PM	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0
Apprch %	0	0		0	0		0	0		
Total %										

	Peyton Drive Southbound			Woodview Road Westbound			Woodview Road Eastbound			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total
Peak Hour Analysis From 04:45 PM to 05:30 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:45 PM										
04:45 PM	0	0	0	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0		0	0		0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268
counts@countsunlimited.com

City of Chino Hills
N/S: Peyton Drive
E/W: Woodview Road
Weather: Clear

File Name : 06_CHH_Peyton_Woodview_PM
Site Code : 05722517
Start Date : 5/24/2022
Page No : 2



Peak Hour Analysis From 04:45 PM to 05:30 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:45 PM			04:45 PM			04:45 PM		
+0 mins.	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0
% App. Total	0	0		0	0		0	0	
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268
counts@countsunlimited.com

City of Chino Hills
N/S: Peyton Drive
E/W: Woodview Road
Weather: Clear

File Name : 06_CHH_Peyton_Woodview_PM
Site Code : 05722517
Start Date : 5/24/2022
Page No : 1

Groups Printed- 4+ Axle Trucks

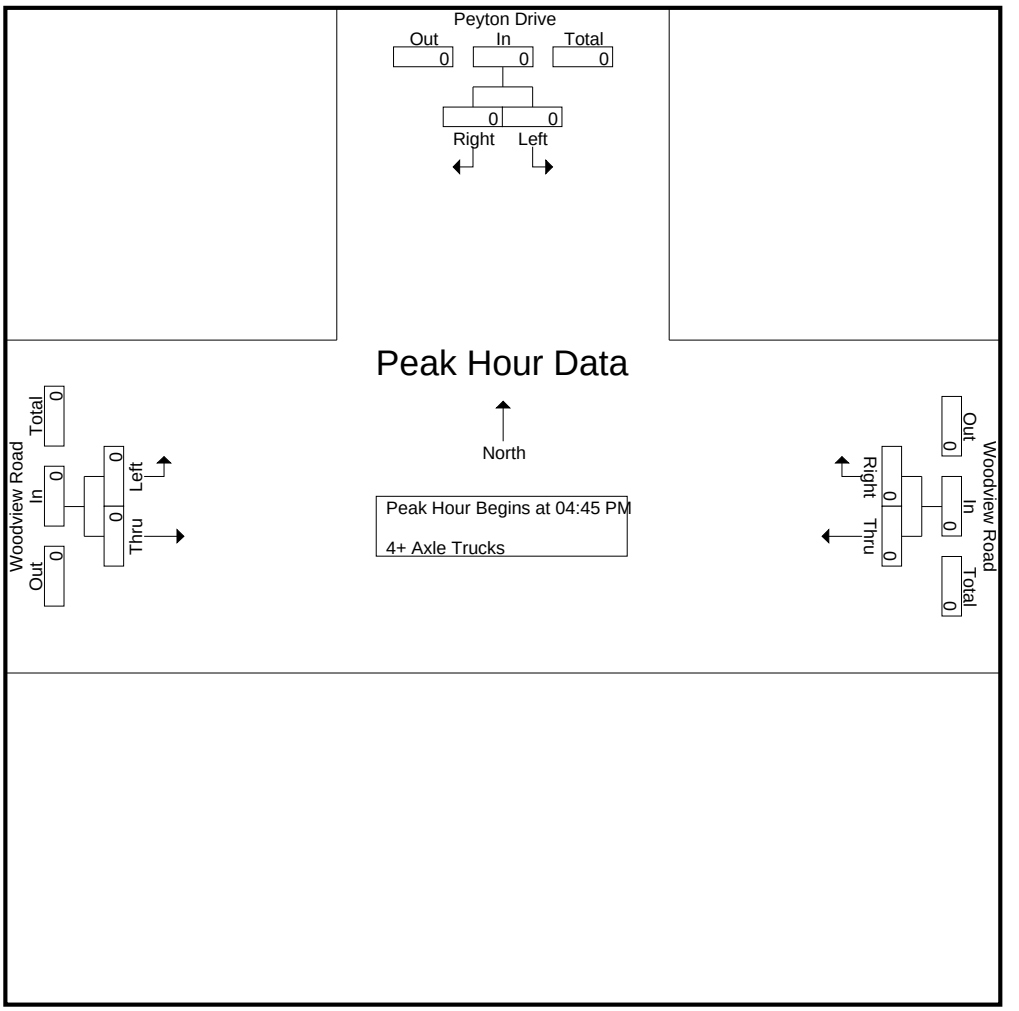
	Peyton Drive Southbound			Woodview Road Westbound			Woodview Road Eastbound			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total
04:00 PM	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0
Apprch %	0	0		0	0		0	0		
Total %										

	Peyton Drive Southbound			Woodview Road Westbound			Woodview Road Eastbound			
Start Time	Left	Right	App. Total	Thru	Right	App. Total	Left	Thru	App. Total	Int. Total
Peak Hour Analysis From 04:45 PM to 05:30 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:45 PM										
04:45 PM	0	0	0	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0		0	0		0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268
counts@countsunlimited.com

City of Chino Hills
N/S: Peyton Drive
E/W: Woodview Road
Weather: Clear

File Name : 06_CHH_Peyton_Woodview_PM
Site Code : 05722517
Start Date : 5/24/2022
Page No : 2



Peak Hour Analysis From 04:45 PM to 05:30 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:45 PM			04:45 PM			04:45 PM		
+0 mins.	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0
% App. Total	0	0		0	0		0	0	
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268
counts@countsunlimited.com

City of Chino Hills
N/S: Pipeline Avenue
E/W: Woodview Road
Weather: Clear

File Name : 07_CHH_Pipeline_Woodview_AM
Site Code : 05722517
Start Date : 5/24/2022
Page No : 1

Groups Printed- Passenger Vehicles - Large 2 Axle Vehicles - 3 Axle Vehicles - 4+ Axle Trucks

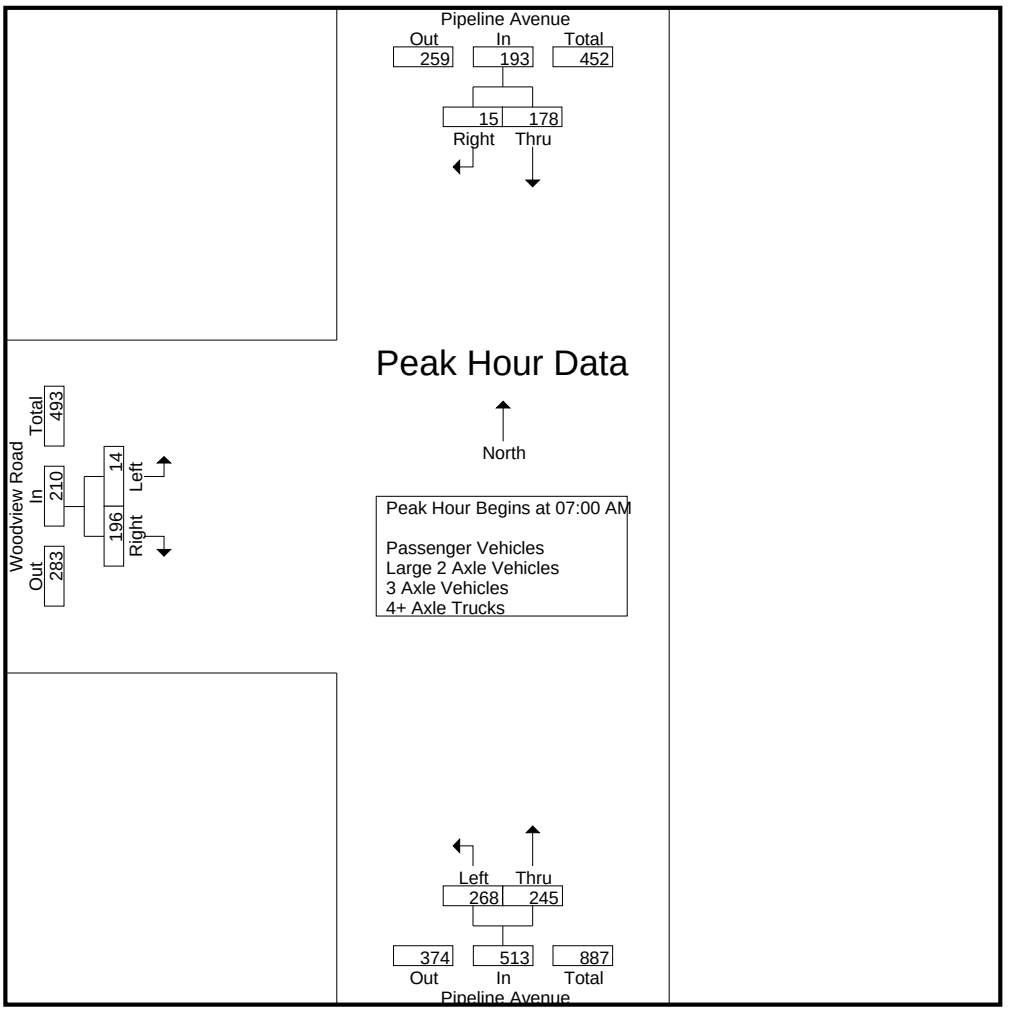
	Pipeline Avenue Southbound			Pipeline Avenue Northbound			Woodview Road Eastbound			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
07:00 AM	45	3	48	96	85	181	2	59	61	290
07:15 AM	52	4	56	119	83	202	3	57	60	318
07:30 AM	52	5	57	26	35	61	4	50	54	172
07:45 AM	29	3	32	27	42	69	5	30	35	136
Total	178	15	193	268	245	513	14	196	210	916
08:00 AM	18	5	23	34	43	77	4	21	25	125
08:15 AM	37	7	44	40	49	89	5	24	29	162
08:30 AM	24	7	31	32	36	68	6	36	42	141
08:45 AM	24	4	28	30	33	63	5	14	19	110
Total	103	23	126	136	161	297	20	95	115	538
Grand Total	281	38	319	404	406	810	34	291	325	1454
Apprch %	88.1	11.9		49.9	50.1		10.5	89.5		
Total %	19.3	2.6	21.9	27.8	27.9	55.7	2.3	20	22.4	
Passenger Vehicles	276	38	314	398	401	799	33	289	322	1435
% Passenger Vehicles	98.2	100	98.4	98.5	98.8	98.6	97.1	99.3	99.1	98.7
Large 2 Axle Vehicles	4	0	4	5	5	10	1	2	3	17
% Large 2 Axle Vehicles	1.4	0	1.3	1.2	1.2	1.2	2.9	0.7	0.9	1.2
3 Axle Vehicles	1	0	1	0	0	0	0	0	0	1
% 3 Axle Vehicles	0.4	0	0.3	0	0	0	0	0	0	0.1
4+ Axle Trucks	0	0	0	1	0	1	0	0	0	1
% 4+ Axle Trucks	0	0	0	0.2	0	0.1	0	0	0	0.1

	Pipeline Avenue Southbound			Pipeline Avenue Northbound			Woodview Road Eastbound			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:00 AM										
07:00 AM	45	3	48	96	**85**	181	2	**59**	**61**	290
07:15 AM	**52**	4	56	**119**	83	**202**	3	57	60	**318**
07:30 AM	52	**5**	**57**	26	35	61	4	50	54	172
07:45 AM	29	3	32	27	42	69	**5**	30	35	136
Total Volume	178	15	193	268	245	513	14	196	210	916
% App. Total	92.2	7.8		52.2	47.8		6.7	93.3		
PHF	.856	.750	.846	.563	.721	.635	.700	.831	.861	.720

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268
counts@countsunlimited.com

City of Chino Hills
N/S: Pipeline Avenue
E/W: Woodview Road
Weather: Clear

File Name : 07_CHH_Pipeline_Woodview_AM
Site Code : 05722517
Start Date : 5/24/2022
Page No : 2



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:00 AM			07:00 AM			07:00 AM		
+0 mins.	45	3	48	96	**85**	181	2	**59**	**61**
+15 mins.	**52**	4	56	**119**	83	**202**	3	57	60
+30 mins.	52	**5**	**57**	26	35	61	4	50	54
+45 mins.	29	3	32	27	42	69	**5**	30	35
Total Volume	178	15	193	268	245	513	14	196	210
% App. Total	92.2	7.8		52.2	47.8		6.7	93.3	
PHF	.856	.750	.846	.563	.721	.635	.700	.831	.861

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268
counts@countsunlimited.com

City of Chino Hills
N/S: Pipeline Avenue
E/W: Woodview Road
Weather: Clear

File Name : 07_CHH_Pipeline_Woodview_AM
Site Code : 05722517
Start Date : 5/24/2022
Page No : 1

Groups Printed- Passenger Vehicles

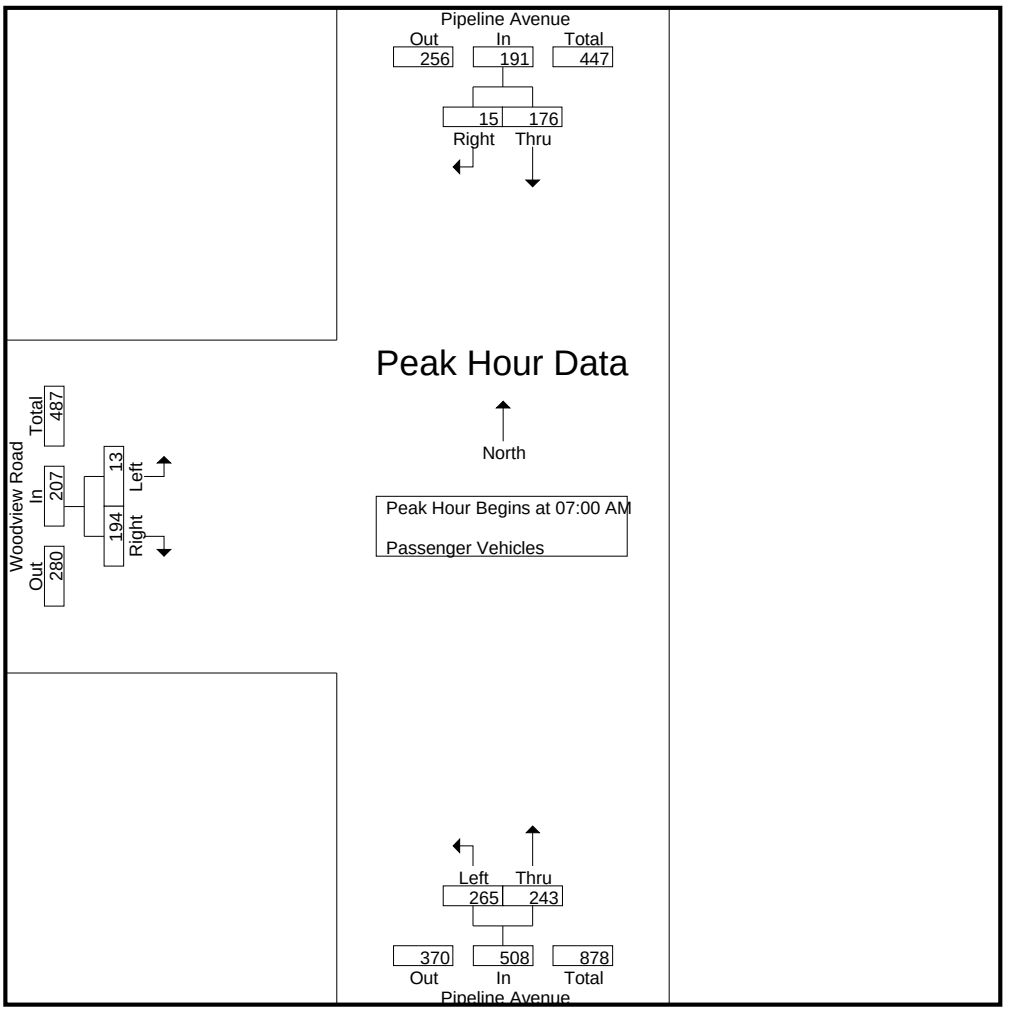
	Pipeline Avenue Southbound			Pipeline Avenue Northbound			Woodview Road Eastbound			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
07:00 AM	45	3	48	95	85	180	2	58	60	288
07:15 AM	52	4	56	118	83	201	3	57	60	317
07:30 AM	52	5	57	26	34	60	4	49	53	170
07:45 AM	27	3	30	26	41	67	4	30	34	131
Total	176	15	191	265	243	508	13	194	207	906
08:00 AM	16	5	21	31	42	73	4	21	25	119
08:15 AM	37	7	44	40	48	88	5	24	29	161
08:30 AM	23	7	30	32	35	67	6	36	42	139
08:45 AM	24	4	28	30	33	63	5	14	19	110
Total	100	23	123	133	158	291	20	95	115	529
Grand Total	276	38	314	398	401	799	33	289	322	1435
Apprch %	87.9	12.1		49.8	50.2		10.2	89.8		
Total %	19.2	2.6	21.9	27.7	27.9	55.7	2.3	20.1	22.4	

	Pipeline Avenue Southbound			Pipeline Avenue Northbound			Woodview Road Eastbound			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 07:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:00 AM										
07:00 AM	45	3	48	95	**85**	180	2	**58**	**60**	288
07:15 AM	**52**	4	56	**118**	83	**201**	3	57	60	**317**
07:30 AM	52	**5**	**57**	26	34	60	**4**	49	53	170
07:45 AM	27	3	30	26	41	67	4	30	34	131
Total Volume	176	15	191	265	243	508	13	194	207	906
% App. Total	92.1	7.9		52.2	47.8		6.3	93.7		
PHF	.846	.750	.838	.561	.715	.632	.813	.836	.863	.715

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268
counts@countsunlimited.com

City of Chino Hills
N/S: Pipeline Avenue
E/W: Woodview Road
Weather: Clear

File Name : 07_CHH_Pipeline_Woodview_AM
Site Code : 05722517
Start Date : 5/24/2022



Peak Hour Analysis From 07:00 AM to 07:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:00 AM			07:00 AM			07:00 AM		
+0 mins.	45	3	48	95	**85**	180	2	**58**	**60**
+15 mins.	**52**	4	56	**118**	83	**201**	3	57	60
+30 mins.	52	**5**	**57**	26	34	60	**4**	49	53
+45 mins.	27	3	30	26	41	67	4	30	34
Total Volume	176	15	191	265	243	508	13	194	207
% App. Total	92.1	7.9		52.2	47.8		6.3	93.7	
PHF	.846	.750	.838	.561	.715	.632	.813	.836	.863

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268
counts@countsunlimited.com

City of Chino Hills
N/S: Pipeline Avenue
E/W: Woodview Road
Weather: Clear

File Name : 07_CHH_Pipeline_Woodview_AM
Site Code : 05722517
Start Date : 5/24/2022
Page No : 1

Groups Printed- Large 2 Axle Vehicles

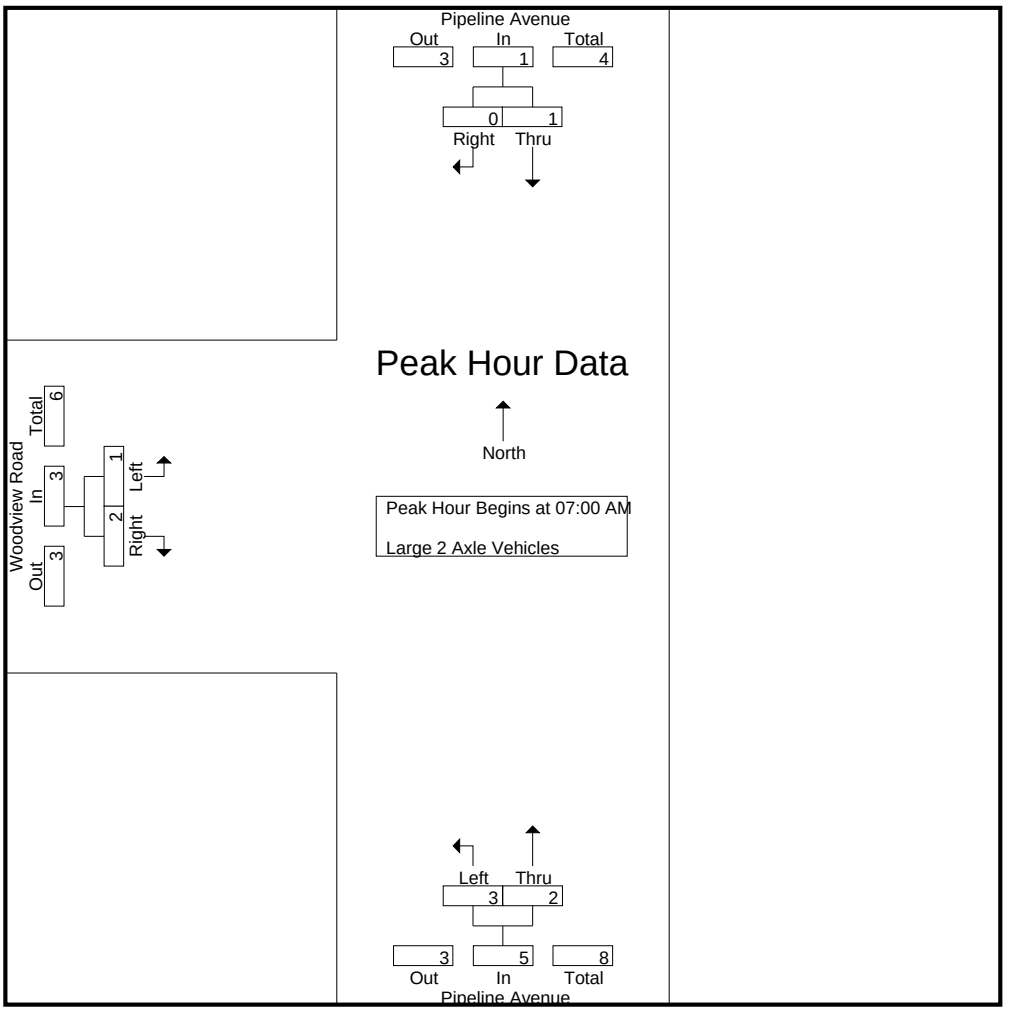
	Pipeline Avenue Southbound			Pipeline Avenue Northbound			Woodview Road Eastbound			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
07:00 AM	0	0	0	1	0	1	0	1	1	2
07:15 AM	0	0	0	1	0	1	0	0	0	1
07:30 AM	0	0	0	0	1	1	0	1	1	2
07:45 AM	1	0	1	1	1	2	1	0	1	4
Total	1	0	1	3	2	5	1	2	3	9
08:00 AM	2	0	2	2	1	3	0	0	0	5
08:15 AM	0	0	0	0	1	1	0	0	0	1
08:30 AM	1	0	1	0	1	1	0	0	0	2
08:45 AM	0	0	0	0	0	0	0	0	0	0
Total	3	0	3	2	3	5	0	0	0	8
Grand Total	4	0	4	5	5	10	1	2	3	17
Apprch %	100	0		50	50		33.3	66.7		
Total %	23.5	0	23.5	29.4	29.4	58.8	5.9	11.8	17.6	

	Pipeline Avenue Southbound			Pipeline Avenue Northbound			Woodview Road Eastbound			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 07:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:00 AM										
07:00 AM	0	0	0	**1**	0	1	0	**1**	**1**	2
07:15 AM	0	0	0	1	0	1	0	0	0	1
07:30 AM	0	0	0	0	**1**	1	0	1	1	2
07:45 AM	**1**	0	**1**	1	1	**2**	**1**	0	1	**4**
Total Volume	1	0	1	3	2	5	1	2	3	9
% App. Total	100	0		60	40		33.3	66.7		
PHF	.250	.000	.250	.750	.500	.625	.250	.500	.750	.563

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268
counts@countsunlimited.com

City of Chino Hills
N/S: Pipeline Avenue
E/W: Woodview Road
Weather: Clear

File Name : 07_CHH_Pipeline_Woodview_AM
Site Code : 05722517
Start Date : 5/24/2022
Page No : 2



Peak Hour Analysis From 07:00 AM to 07:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:00 AM			07:00 AM			07:00 AM		
+0 mins.	0	0	0	**1**	0	1	0	**1**	**1**
+15 mins.	0	0	0	1	0	1	0	0	0
+30 mins.	0	0	0	0	**1**	1	0	1	1
+45 mins.	**1**	0	**1**	1	1	**2**	**1**	0	1
Total Volume	1	0	1	3	2	5	1	2	3
% App. Total	100	0		60	40		33.3	66.7	
PHF	.250	.000	.250	.750	.500	.625	.250	.500	.750

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268
counts@countsunlimited.com

City of Chino Hills
N/S: Pipeline Avenue
E/W: Woodview Road
Weather: Clear

File Name : 07_CHH_Pipeline_Woodview_AM
Site Code : 05722517
Start Date : 5/24/2022
Page No : 1

Groups Printed- 3 Axle Vehicles

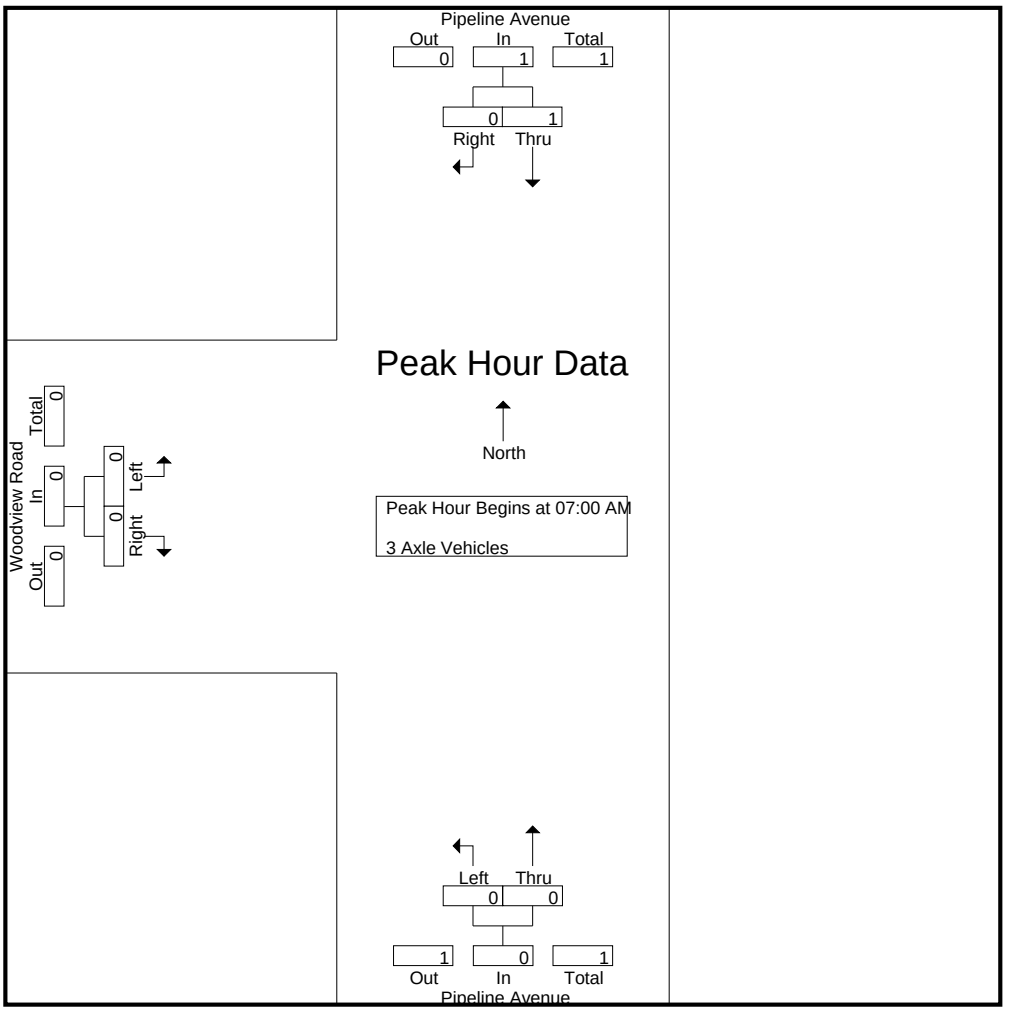
	Pipeline Avenue Southbound			Pipeline Avenue Northbound			Woodview Road Eastbound			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0
07:45 AM	1	0	1	0	0	0	0	0	0	1
Total	1	0	1	0	0	0	0	0	0	1
08:00 AM	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0
Grand Total	1	0	1	0	0	0	0	0	0	1
Apprch %	100	0		0	0		0	0		
Total %	100	0	100	0	0	0	0	0	0	

	Pipeline Avenue Southbound			Pipeline Avenue Northbound			Woodview Road Eastbound			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 07:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:00 AM										
07:00 AM	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0
07:45 AM	**1**	0	**1**	0	0	0	0	0	0	**1**
Total Volume	1	0	1	0	0	0	0	0	0	1
% App. Total	100	0		0	0		0	0		
PHF	.250	.000	.250	.000	.000	.000	.000	.000	.000	.250

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268
counts@countsunlimited.com

City of Chino Hills
N/S: Pipeline Avenue
E/W: Woodview Road
Weather: Clear

File Name : 07_CHH_Pipeline_Woodview_AM
Site Code : 05722517
Start Date : 5/24/2022
Page No : 2



Peak Hour Analysis From 07:00 AM to 07:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:00 AM			07:00 AM			07:00 AM		
+0 mins.	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0
+45 mins.	**1**	0	**1**	0	0	0	0	0	0
Total Volume	1	0	1	0	0	0	0	0	0
% App. Total	100	0		0	0		0	0	
PHF	.250	.000	.250	.000	.000	.000	.000	.000	.000

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268
counts@countsunlimited.com

City of Chino Hills
N/S: Pipeline Avenue
E/W: Woodview Road
Weather: Clear

File Name : 07_CHH_Pipeline_Woodview_AM
Site Code : 05722517
Start Date : 5/24/2022
Page No : 1

Groups Printed- 4+ Axle Trucks

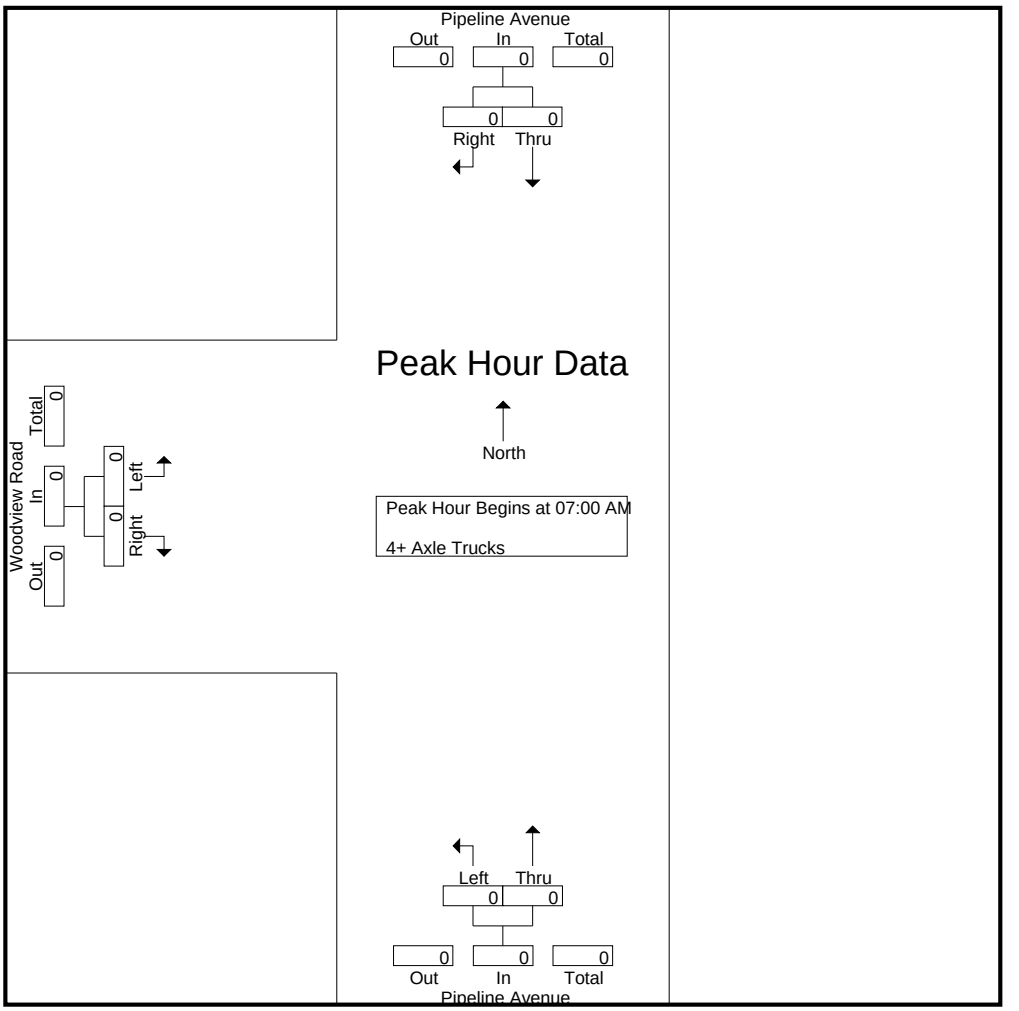
	Pipeline Avenue Southbound			Pipeline Avenue Northbound			Woodview Road Eastbound			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0
08:00 AM	0	0	0	1	0	1	0	0	0	1
08:15 AM	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	1	0	1	0	0	0	1
Grand Total	0	0	0	1	0	1	0	0	0	1
Apprch %	0	0		100	0		0	0		
Total %	0	0	0	100	0	100	0	0	0	

	Pipeline Avenue Southbound			Pipeline Avenue Northbound			Woodview Road Eastbound			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 07:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:00 AM										
07:00 AM	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0		0	0		0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268
counts@countsunlimited.com

City of Chino Hills
N/S: Pipeline Avenue
E/W: Woodview Road
Weather: Clear

File Name : 07_CHH_Pipeline_Woodview_AM
Site Code : 05722517
Start Date : 5/24/2022
Page No : 2



Peak Hour Analysis From 07:00 AM to 07:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:00 AM			07:00 AM			07:00 AM		
+0 mins.	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0
% App. Total	0	0		0	0		0	0	
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268
counts@countsunlimited.com

City of Chino Hills
N/S: Pipeline Avenue
E/W: Woodview Road
Weather: Clear

File Name : 07_CHH_Pipeline_Woodview_PM
Site Code : 05722517
Start Date : 5/24/2022
Page No : 1

Groups Printed- Passenger Vehicles - Large 2 Axle Vehicles - 3 Axle Vehicles - 4+ Axle Trucks

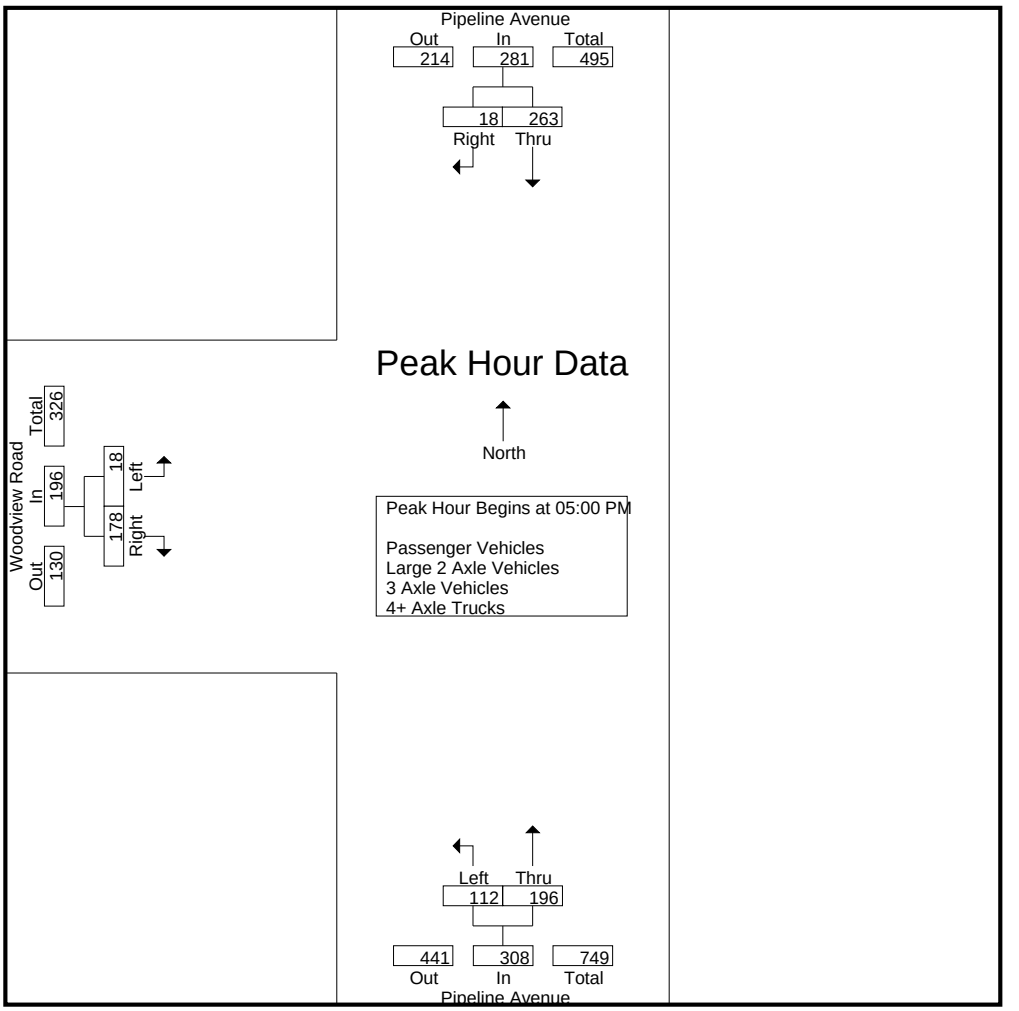
	Pipeline Avenue Southbound			Pipeline Avenue Northbound			Woodview Road Eastbound			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
04:00 PM	40	4	44	22	42	64	5	33	38	146
04:15 PM	50	7	57	21	45	66	2	39	41	164
04:30 PM	57	4	61	26	41	67	10	40	50	178
04:45 PM	48	6	54	29	49	78	4	38	42	174
Total	195	21	216	98	177	275	21	150	171	662
05:00 PM	73	4	77	32	38	70	5	52	57	204
05:15 PM	56	4	60	28	55	83	3	43	46	189
05:30 PM	67	6	73	30	48	78	6	43	49	200
05:45 PM	67	4	71	22	55	77	4	40	44	192
Total	263	18	281	112	196	308	18	178	196	785
Grand Total	458	39	497	210	373	583	39	328	367	1447
Apprch %	92.2	7.8		36	64		10.6	89.4		
Total %	31.7	2.7	34.3	14.5	25.8	40.3	2.7	22.7	25.4	
Passenger Vehicles	458	39	497	210	372	582	39	327	366	1445
% Passenger Vehicles	100	100	100	100	99.7	99.8	100	99.7	99.7	99.9
Large 2 Axle Vehicles	0	0	0	0	0	0	0	1	1	1
% Large 2 Axle Vehicles	0	0	0	0	0	0	0	0.3	0.3	0.1
3 Axle Vehicles	0	0	0	0	0	0	0	0	0	0
% 3 Axle Vehicles	0	0	0	0	0	0	0	0	0	0
4+ Axle Trucks	0	0	0	0	1	1	0	0	0	1
% 4+ Axle Trucks	0	0	0	0	0.3	0.2	0	0	0	0.1

	Pipeline Avenue Southbound			Pipeline Avenue Northbound			Woodview Road Eastbound			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 05:00 PM										
05:00 PM	**73**	4	**77**	**32**	38	70	5	**52**	**57**	**204**
05:15 PM	56	4	60	28	**55**	**83**	3	43	46	189
05:30 PM	67	**6**	73	30	48	78	**6**	43	49	200
05:45 PM	67	4	71	22	55	77	4	40	44	192
Total Volume	263	18	281	112	196	308	18	178	196	785
% App. Total	93.6	6.4		36.4	63.6		9.2	90.8		
PHF	.901	.750	.912	.875	.891	.928	.750	.856	.860	.962

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268
counts@countsunlimited.com

City of Chino Hills
N/S: Pipeline Avenue
E/W: Woodview Road
Weather: Clear

File Name : 07_CHH_Pipeline_Woodview_PM
Site Code : 05722517
Start Date : 5/24/2022
Page No : 2



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	05:00 PM			04:45 PM			05:00 PM		
+0 mins.	**73**	4	**77**	29	49	78	5	**52**	**57**
+15 mins.	56	4	60	**32**	38	70	3	43	46
+30 mins.	67	**6**	73	28	**55**	**83**	**6**	43	49
+45 mins.	67	4	71	30	48	78	4	40	44
Total Volume	263	18	281	119	190	309	18	178	196
% App. Total	93.6	6.4		38.5	61.5		9.2	90.8	
PHF	.901	.750	.912	.930	.864	.931	.750	.856	.860

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268
counts@countsunlimited.com

City of Chino Hills
N/S: Pipeline Avenue
E/W: Woodview Road
Weather: Clear

File Name : 07_CHH_Pipeline_Woodview_PM
Site Code : 05722517
Start Date : 5/24/2022
Page No : 1

Groups Printed- Passenger Vehicles

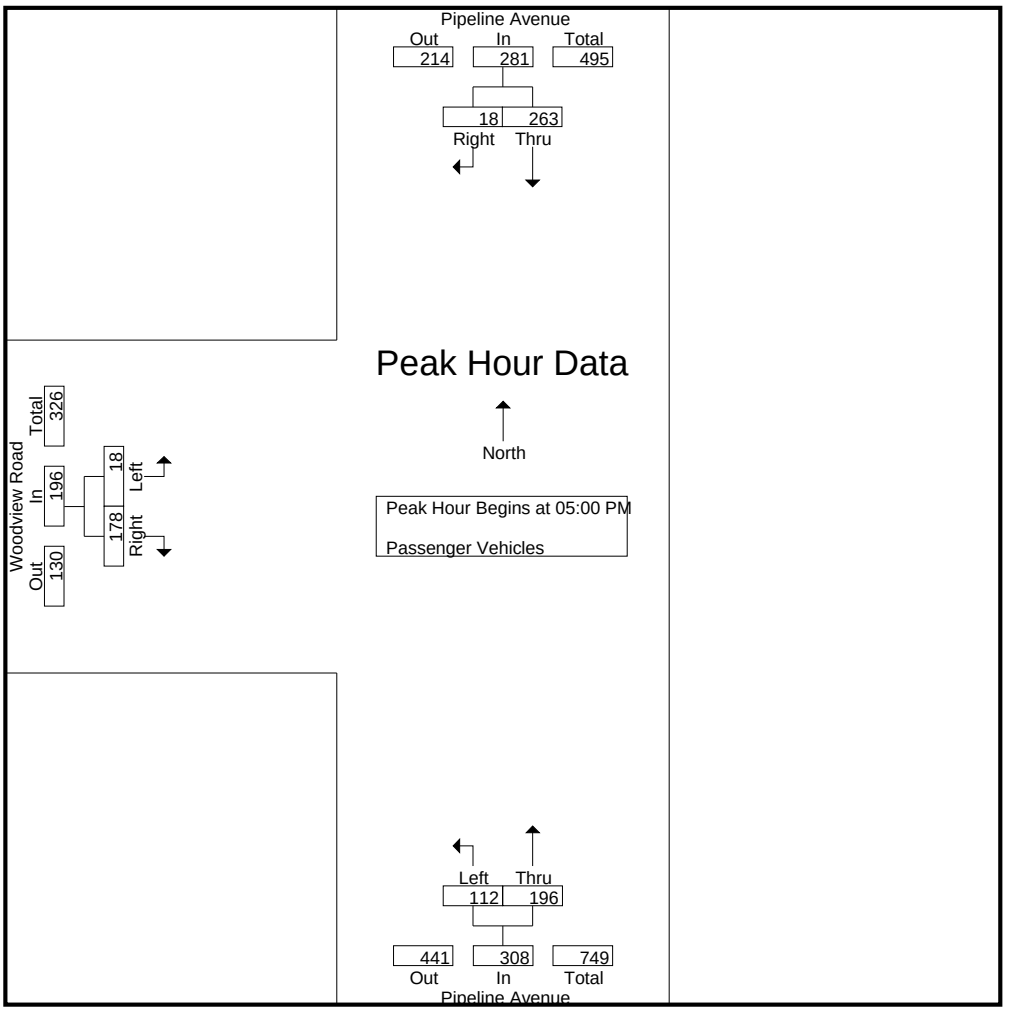
	Pipeline Avenue Southbound			Pipeline Avenue Northbound			Woodview Road Eastbound			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
04:00 PM	40	4	44	22	42	64	5	32	37	145
04:15 PM	50	7	57	21	45	66	2	39	41	164
04:30 PM	57	4	61	26	40	66	10	40	50	177
04:45 PM	48	6	54	29	49	78	4	38	42	174
Total	195	21	216	98	176	274	21	149	170	660
05:00 PM	73	4	77	32	38	70	5	52	57	204
05:15 PM	56	4	60	28	55	83	3	43	46	189
05:30 PM	67	6	73	30	48	78	6	43	49	200
05:45 PM	67	4	71	22	55	77	4	40	44	192
Total	263	18	281	112	196	308	18	178	196	785
Grand Total	458	39	497	210	372	582	39	327	366	1445
Apprch %	92.2	7.8		36.1	63.9		10.7	89.3		
Total %	31.7	2.7	34.4	14.5	25.7	40.3	2.7	22.6	25.3	

	Pipeline Avenue Southbound			Pipeline Avenue Northbound			Woodview Road Eastbound			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
Peak Hour Analysis From 05:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 05:00 PM										
05:00 PM	**73**	4	**77**	**32**	38	70	5	**52**	**57**	**204**
05:15 PM	56	4	60	28	**55**	**83**	3	43	46	189
05:30 PM	67	**6**	73	30	48	78	**6**	43	49	200
05:45 PM	67	4	71	22	55	77	4	40	44	192
Total Volume	263	18	281	112	196	308	18	178	196	785
% App. Total	93.6	6.4		36.4	63.6		9.2	90.8		
PHF	.901	.750	.912	.875	.891	.928	.750	.856	.860	.962

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268
counts@countsunlimited.com

City of Chino Hills
N/S: Pipeline Avenue
E/W: Woodview Road
Weather: Clear

File Name : 07_CHH_Pipeline_Woodview_PM
Site Code : 05722517
Start Date : 5/24/2022
Page No : 2



Peak Hour Analysis From 05:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	05:00 PM			05:00 PM			05:00 PM		
+0 mins.	**73**	4	**77**	**32**	38	70	5	**52**	**57**
+15 mins.	56	4	60	28	**55**	**83**	3	43	46
+30 mins.	67	**6**	73	30	48	78	**6**	43	49
+45 mins.	67	4	71	22	55	77	4	40	44
Total Volume	263	18	281	112	196	308	18	178	196
% App. Total	93.6	6.4		36.4	63.6		9.2	90.8	
PHF	.901	.750	.912	.875	.891	.928	.750	.856	.860

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268
counts@countsunlimited.com

City of Chino Hills
N/S: Pipeline Avenue
E/W: Woodview Road
Weather: Clear

File Name : 07_CHH_Pipeline_Woodview_PM
Site Code : 05722517
Start Date : 5/24/2022
Page No : 1

Groups Printed- Large 2 Axle Vehicles

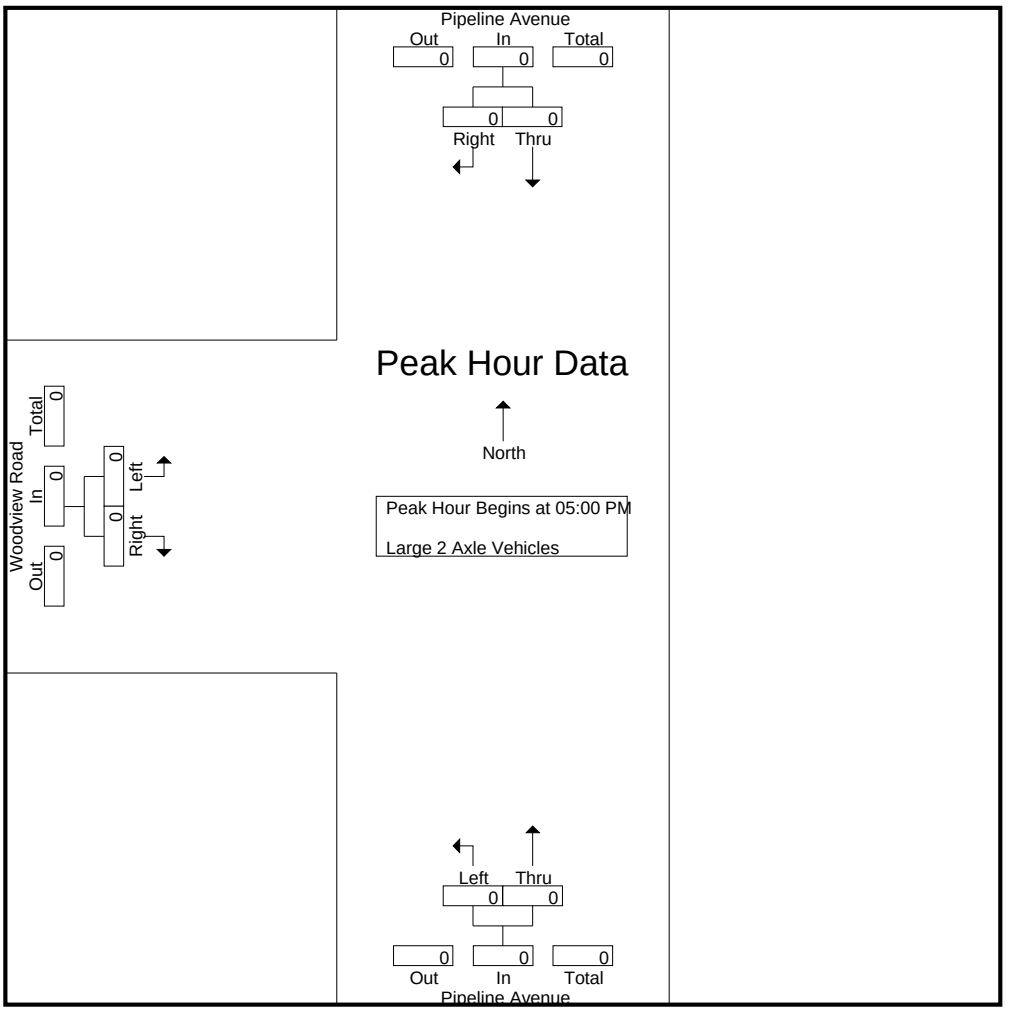
	Pipeline Avenue Southbound			Pipeline Avenue Northbound			Woodview Road Eastbound			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
04:00 PM	0	0	0	0	0	0	0	1	1	1
04:15 PM	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	1	1	1
05:00 PM	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	1	1	1
Apprch %	0	0		0	0		0	100		
Total %	0	0	0	0	0	0	0	100	100	

	Pipeline Avenue Southbound			Pipeline Avenue Northbound			Woodview Road Eastbound			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
Peak Hour Analysis From 05:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 05:00 PM										
05:00 PM	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0		0	0		0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268
counts@countsunlimited.com

City of Chino Hills
N/S: Pipeline Avenue
E/W: Woodview Road
Weather: Clear

File Name : 07_CHH_Pipeline_Woodview_PM
Site Code : 05722517
Start Date : 5/24/2022
Page No : 2



Peak Hour Analysis From 05:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	05:00 PM			05:00 PM			05:00 PM		
+0 mins.	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0
% App. Total	0	0		0	0		0	0	
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268
counts@countsunlimited.com

City of Chino Hills
N/S: Pipeline Avenue
E/W: Woodview Road
Weather: Clear

File Name : 07_CHH_Pipeline_Woodview_PM
Site Code : 05722517
Start Date : 5/24/2022
Page No : 1

Groups Printed- 3 Axle Vehicles

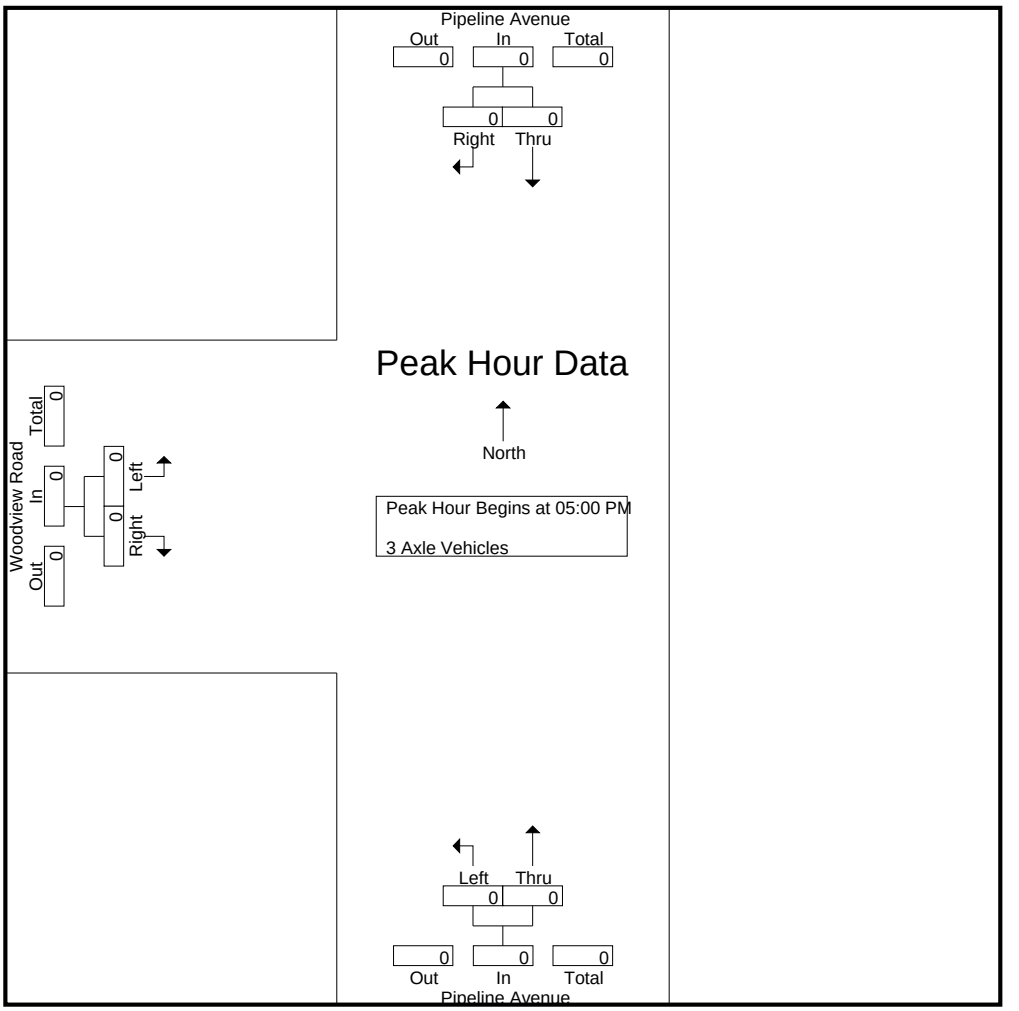
	Pipeline Avenue Southbound			Pipeline Avenue Northbound			Woodview Road Eastbound			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
04:00 PM	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0
Apprch %	0	0		0	0		0	0		
Total %										

	Pipeline Avenue Southbound			Pipeline Avenue Northbound			Woodview Road Eastbound			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
Peak Hour Analysis From 05:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 05:00 PM										
05:00 PM	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0		0	0		0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268
counts@countsunlimited.com

City of Chino Hills
N/S: Pipeline Avenue
E/W: Woodview Road
Weather: Clear

File Name : 07_CHH_Pipeline_Woodview_PM
Site Code : 05722517
Start Date : 5/24/2022
Page No : 2



Peak Hour Analysis From 05:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	05:00 PM			05:00 PM			05:00 PM		
+0 mins.	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0
% App. Total	0	0		0	0		0	0	
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268
counts@countsunlimited.com

City of Chino Hills
N/S: Pipeline Avenue
E/W: Woodview Road
Weather: Clear

File Name : 07_CHH_Pipeline_Woodview_PM
Site Code : 05722517
Start Date : 5/24/2022
Page No : 1

Groups Printed- 4+ Axle Trucks

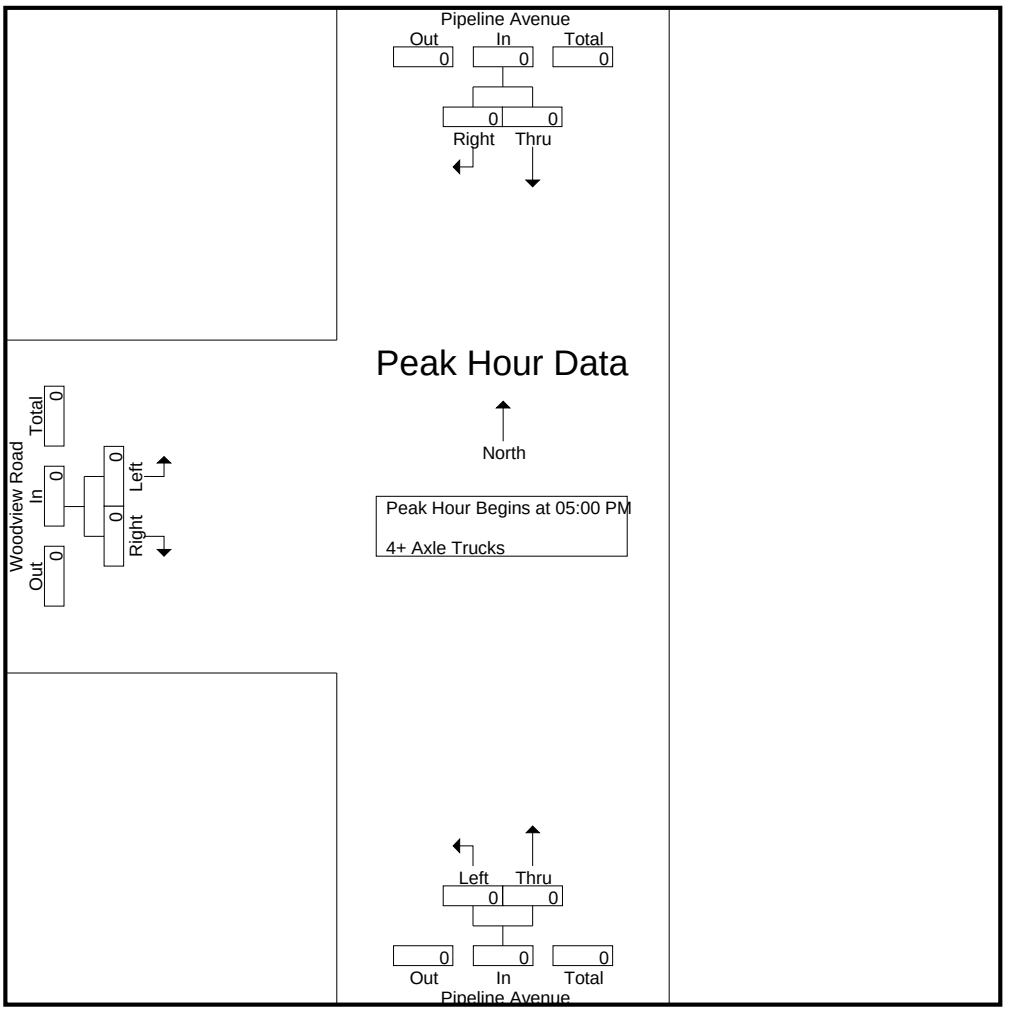
	Pipeline Avenue Southbound			Pipeline Avenue Northbound			Woodview Road Eastbound			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
04:00 PM	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	1	1	0	0	0	1
04:45 PM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	1	1	0	0	0	1
05:00 PM	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	1	1	0	0	0	1
Apprch %	0	0		0	100		0	0		
Total %	0	0	0	0	100	100	0	0	0	

	Pipeline Avenue Southbound			Pipeline Avenue Northbound			Woodview Road Eastbound			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
Peak Hour Analysis From 05:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 05:00 PM										
05:00 PM	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0		0	0		0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268
counts@countsunlimited.com

City of Chino Hills
N/S: Pipeline Avenue
E/W: Woodview Road
Weather: Clear

File Name : 07_CHH_Pipeline_Woodview_PM
Site Code : 05722517
Start Date : 5/24/2022
Page No : 2



Peak Hour Analysis From 05:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	05:00 PM			05:00 PM			05:00 PM		
+0 mins.	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0
% App. Total	0	0		0	0		0	0	
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268
counts@countsunlimited.com

City of Chino Hills
N/S: Pipeline Avenue
E/W: Soquel Canyon Parkway
Weather: Clear

File Name : 08_CHH_Pipeline_Soquel Cyn_AM
Site Code : 05722517
Start Date : 5/24/2022
Page No : 1

Groups Printed- Passenger Vehicles - Large 2 Axle Vehicles - 3 Axle Vehicles - 4+ Axle Trucks

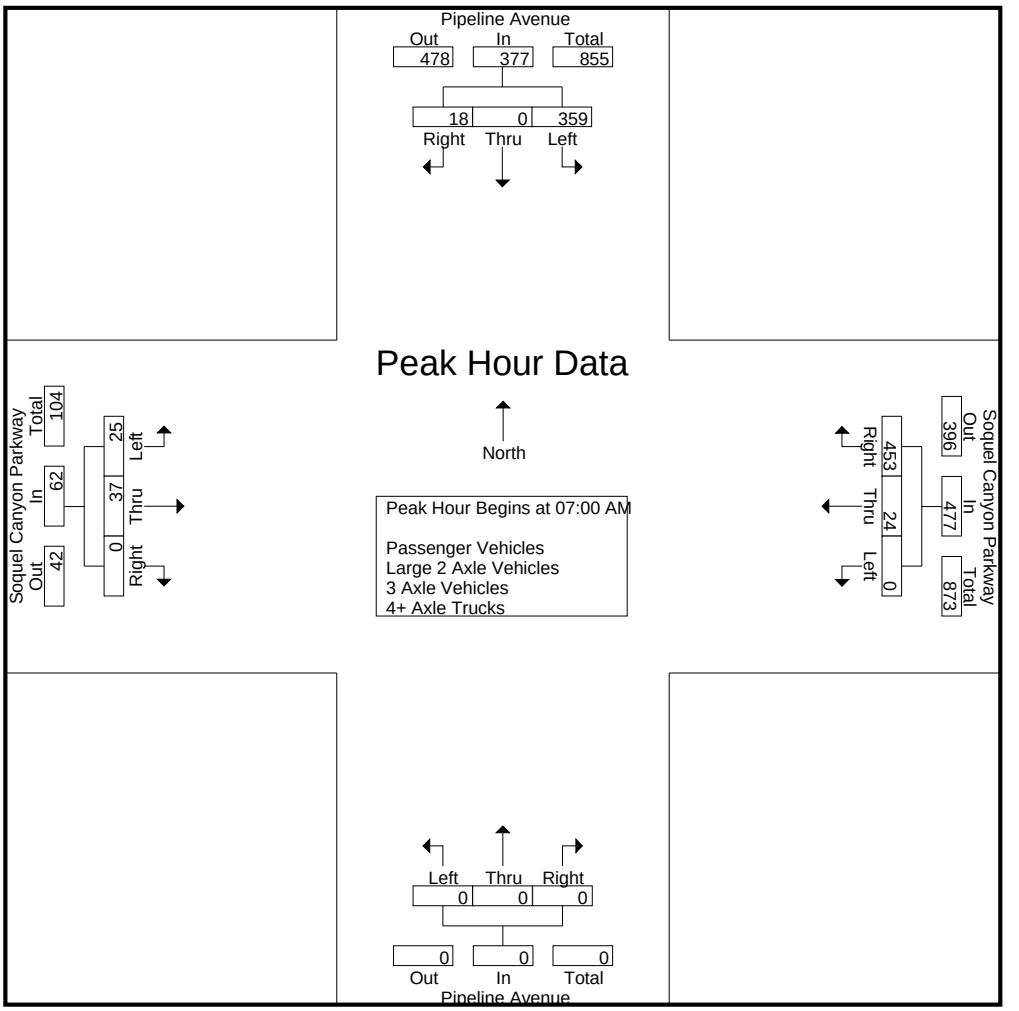
	Pipeline Avenue Southbound				Soquel Canyon Parkway Westbound				Pipeline Avenue Northbound				Soquel Canyon Parkway Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	105	0	5	110	0	7	174	181	0	0	0	0	9	16	0	25	316
07:15 AM	100	0	5	105	0	8	175	183	0	0	0	0	9	3	0	12	300
07:30 AM	97	0	5	102	0	4	51	55	0	0	0	0	5	7	0	12	169
07:45 AM	57	0	3	60	0	5	53	58	0	0	0	0	2	11	0	13	131
Total	359	0	18	377	0	24	453	477	0	0	0	0	25	37	0	62	916
08:00 AM	42	0	2	44	10	5	76	91	0	0	0	0	3	9	0	12	147
08:15 AM	66	0	1	67	26	6	74	106	0	0	0	0	7	6	0	13	186
08:30 AM	57	0	6	63	5	3	63	71	0	0	0	0	4	8	0	12	146
08:45 AM	33	0	3	36	1	8	56	65	0	0	0	0	4	6	0	10	111
Total	198	0	12	210	42	22	269	333	0	0	0	0	18	29	0	47	590
Grand Total	557	0	30	587	42	46	722	810	0	0	0	0	43	66	0	109	1506
Apprch %	94.9	0	5.1		5.2	5.7	89.1		0	0	0		39.4	60.6	0		
Total %	37	0	2	39	2.8	3.1	47.9	53.8	0	0	0	0	2.9	4.4	0	7.2	
Passenger Vehicles	552	0	30	582	42	45	713	800	0	0	0	0	43	66	0	109	1491
% Passenger Vehicles	99.1	0	100	99.1	100	97.8	98.8	98.8	0	0	0	0	100	100	0	100	99
Large 2 Axle Vehicles	5	0	0	5	0	0	7	7	0	0	0	0	0	0	0	0	12
% Large 2 Axle Vehicles	0.9	0	0	0.9	0	0	1	0.9	0	0	0	0	0	0	0	0	0.8
3 Axle Vehicles	0	0	0	0	0	1	1	2	0	0	0	0	0	0	0	0	2
% 3 Axle Vehicles	0	0	0	0	0	2.2	0.1	0.2	0	0	0	0	0	0	0	0	0.1
4+ Axle Trucks	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	1
% 4+ Axle Trucks	0	0	0	0	0	0	0.1	0.1	0	0	0	0	0	0	0	0	0.1

	Pipeline Avenue Southbound				Soquel Canyon Parkway Westbound				Pipeline Avenue Northbound				Soquel Canyon Parkway Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	**105**	0	**5**	**110**	0	7	174	181	0	0	0	0	**9**	**16**	0	**25**	**316**
07:15 AM	100	0	5	105	0	**8**	**175**	**183**	0	0	0	0	9	3	0	12	300
07:30 AM	97	0	5	102	0	4	51	55	0	0	0	0	5	7	0	12	169
07:45 AM	57	0	3	60	0	5	53	58	0	0	0	0	2	11	0	13	131
Total Volume	359	0	18	377	0	24	453	477	0	0	0	0	25	37	0	62	916
% App. Total	95.2	0	4.8		0	5	95		0	0	0		40.3	59.7	0		
PHF	.855	.000	.900	.857	.000	.750	.647	.652	.000	.000	.000	.000	.694	.578	.000	.620	.725

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268
counts@countsunlimited.com

City of Chino Hills
N/S: Pipeline Avenue
E/W: Soquel Canyon Parkway
Weather: Clear

File Name : 08_CHH_Pipeline_Soquel Cyn_AM
Site Code : 05722517
Start Date : 5/24/2022



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:00 AM				07:00 AM				07:00 AM				07:00 AM			
+0 mins.	**105**	0	**5**	**110**	0	7	174	181	0	0	0	0	**9**	**16**	0	**25**
+15 mins.	100	0	5	105	0	**8**	**175**	**183**	0	0	0	0	9	3	0	12
+30 mins.	97	0	5	102	0	4	51	55	0	0	0	0	5	7	0	12
+45 mins.	57	0	3	60	0	5	53	58	0	0	0	0	2	11	0	13
Total Volume	359	0	18	377	0	24	453	477	0	0	0	0	25	37	0	62
% App. Total	95.2	0	4.8		0	5	95		0	0	0		40.3	59.7	0	
PHF	.855	.000	.900	.857	.000	.750	.647	.652	.000	.000	.000	.000	.694	.578	.000	.620

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268
counts@countsunlimited.com

City of Chino Hills
N/S: Pipeline Avenue
E/W: Soquel Canyon Parkway
Weather: Clear

File Name : 08_CHH_Pipeline_Soquel Cyn_AM
Site Code : 05722517
Start Date : 5/24/2022
Page No : 1

Groups Printed- Passenger Vehicles

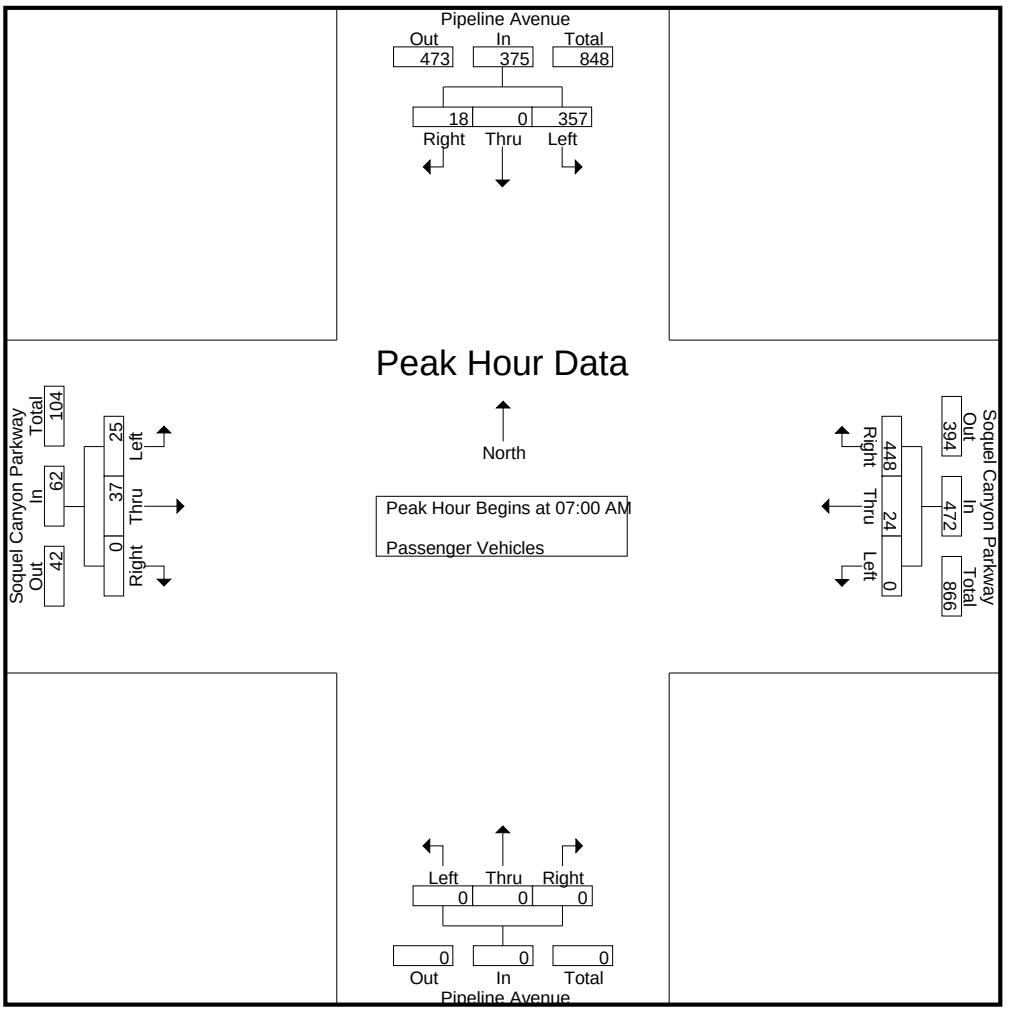
	Pipeline Avenue Southbound				Soquel Canyon Parkway Westbound				Pipeline Avenue Northbound				Soquel Canyon Parkway Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	104	0	5	109	0	7	173	180	0	0	0	0	9	16	0	25	314
07:15 AM	100	0	5	105	0	8	175	183	0	0	0	0	9	3	0	12	300
07:30 AM	96	0	5	101	0	4	49	53	0	0	0	0	5	7	0	12	166
07:45 AM	57	0	3	60	0	5	51	56	0	0	0	0	2	11	0	13	129
Total	357	0	18	375	0	24	448	472	0	0	0	0	25	37	0	62	909
08:00 AM	41	0	2	43	10	4	73	87	0	0	0	0	3	9	0	12	142
08:15 AM	66	0	1	67	26	6	73	105	0	0	0	0	7	6	0	13	185
08:30 AM	56	0	6	62	5	3	63	71	0	0	0	0	4	8	0	12	145
08:45 AM	32	0	3	35	1	8	56	65	0	0	0	0	4	6	0	10	110
Total	195	0	12	207	42	21	265	328	0	0	0	0	18	29	0	47	582
Grand Total	552	0	30	582	42	45	713	800	0	0	0	0	43	66	0	109	1491
Apprch %	94.8	0	5.2		5.2	5.6	89.1		0	0	0		39.4	60.6	0		
Total %	37	0	2	39	2.8	3	47.8	53.7	0	0	0	0	2.9	4.4	0	7.3	

	Pipeline Avenue Southbound				Soquel Canyon Parkway Westbound				Pipeline Avenue Northbound				Soquel Canyon Parkway Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 07:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	**104**	0	**5**	**109**	0	7	173	180	0	0	0	0	**9**	**16**	0	**25**	**314**
07:15 AM	100	0	5	105	0	**8**	**175**	**183**	0	0	0	0	9	3	0	12	300
07:30 AM	96	0	5	101	0	4	49	53	0	0	0	0	5	7	0	12	166
07:45 AM	57	0	3	60	0	5	51	56	0	0	0	0	2	11	0	13	129
Total Volume	357	0	18	375	0	24	448	472	0	0	0	0	25	37	0	62	909
% App. Total	95.2	0	4.8		0	5.1	94.9		0	0	0		40.3	59.7	0		
PHF	.858	.000	.900	.860	.000	.750	.640	.645	.000	.000	.000	.000	.694	.578	.000	.620	.724

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268
counts@countsunlimited.com

City of Chino Hills
N/S: Pipeline Avenue
E/W: Soquel Canyon Parkway
Weather: Clear

File Name : 08_CHH_Pipeline_Soquel Cyn_AM
Site Code : 05722517
Start Date : 5/24/2022
Page No : 2



Peak Hour Analysis From 07:00 AM to 07:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:00 AM				07:00 AM				07:00 AM				07:00 AM			
+0 mins.	**104**	0	**5**	**109**	0	7	173	180	0	0	0	0	**9**	**16**	0	**25**
+15 mins.	100	0	5	105	0	**8**	**175**	**183**	0	0	0	0	9	3	0	12
+30 mins.	96	0	5	101	0	4	49	53	0	0	0	0	5	7	0	12
+45 mins.	57	0	3	60	0	5	51	56	0	0	0	0	2	11	0	13
Total Volume	357	0	18	375	0	24	448	472	0	0	0	0	25	37	0	62
% App. Total	95.2	0	4.8		0	5.1	94.9		0	0	0		40.3	59.7	0	
PHF	.858	.000	.900	.860	.000	.750	.640	.645	.000	.000	.000	.000	.694	.578	.000	.620

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268
counts@countsunlimited.com

City of Chino Hills
N/S: Pipeline Avenue
E/W: Soquel Canyon Parkway
Weather: Clear

File Name : 08_CHH_Pipeline_Soquel Cyn_AM
Site Code : 05722517
Start Date : 5/24/2022
Page No : 1

Groups Printed- Large 2 Axle Vehicles

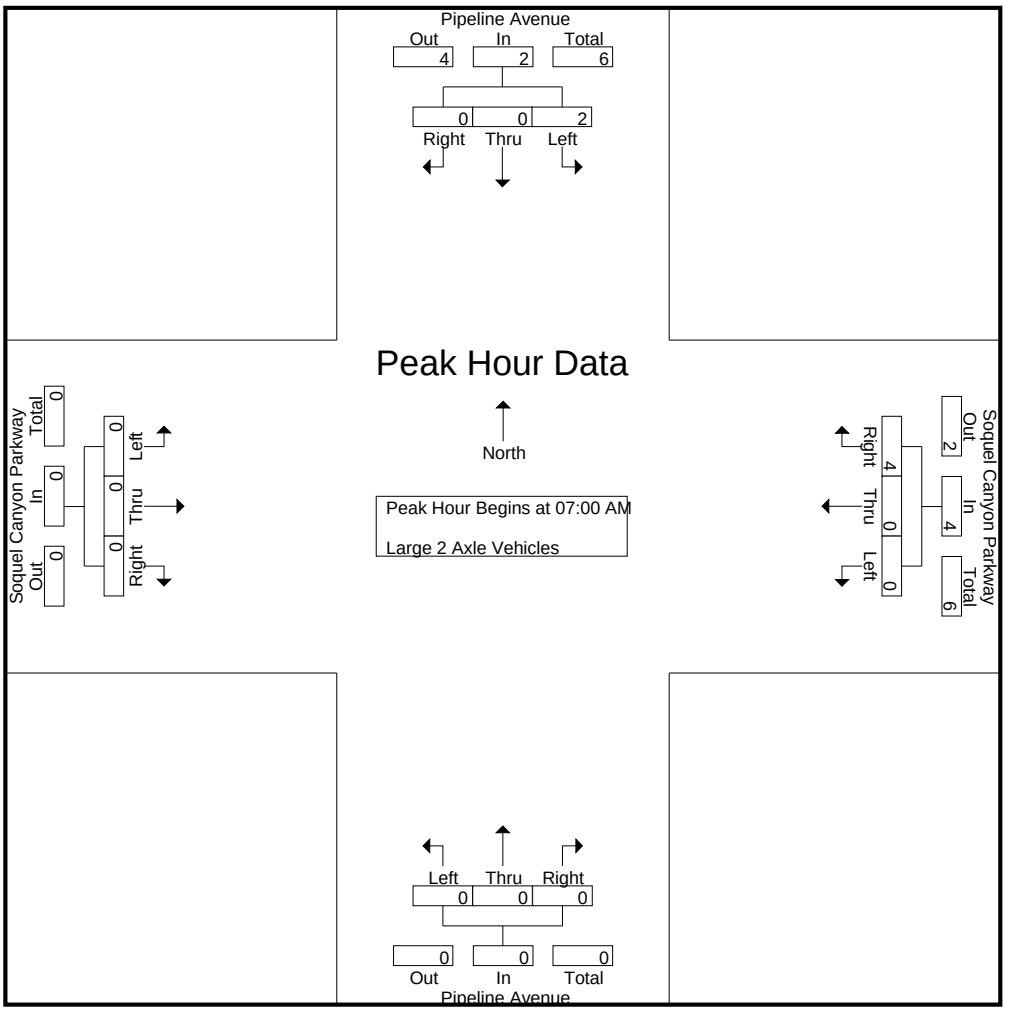
	Pipeline Avenue Southbound				Soquel Canyon Parkway Westbound				Pipeline Avenue Northbound				Soquel Canyon Parkway Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	1	0	0	1	0	0	1	1	0	0	0	0	0	0	0	0	2
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	1	0	0	1	0	0	1	1	0	0	0	0	0	0	0	0	2
07:45 AM	0	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	2
Total	2	0	0	2	0	0	4	4	0	0	0	0	0	0	0	0	6
08:00 AM	1	0	0	1	0	0	2	2	0	0	0	0	0	0	0	0	3
08:15 AM	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	1
08:30 AM	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
08:45 AM	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Total	3	0	0	3	0	0	3	3	0	0	0	0	0	0	0	0	6
Grand Total	5	0	0	5	0	0	7	7	0	0	0	0	0	0	0	0	12
Apprch %	100	0	0		0	0	100		0	0	0		0	0	0		
Total %	41.7	0	0	41.7	0	0	58.3	58.3	0	0	0	0	0	0	0	0	

	Pipeline Avenue Southbound				Soquel Canyon Parkway Westbound				Pipeline Avenue Northbound				Soquel Canyon Parkway Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 07:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	**1**	0	0	**1**	0	0	1	1	0	0	0	0	0	0	0	0	**2**
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	1	0	0	1	0	0	1	1	0	0	0	0	0	0	0	0	2
07:45 AM	0	0	0	0	0	0	**2**	**2**	0	0	0	0	0	0	0	0	2
Total Volume	2	0	0	2	0	0	4	4	0	0	0	0	0	0	0	0	6
% App. Total	100	0	0		0	0	100		0	0	0		0	0	0		
PHF	.500	.000	.000	.500	.000	.000	.500	.500	.000	.000	.000	.000	.000	.000	.000	.000	.750

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268
counts@countsunlimited.com

City of Chino Hills
N/S: Pipeline Avenue
E/W: Soquel Canyon Parkway
Weather: Clear

File Name : 08_CHH_Pipeline_Soquel Cyn_AM
Site Code : 05722517
Start Date : 5/24/2022



Peak Hour Analysis From 07:00 AM to 07:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:00 AM				07:00 AM				07:00 AM				07:00 AM			
+0 mins.	**1**	0	0	**1**	0	0	1	1	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+30 mins.	1	0	0	1	0	0	1	1	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	0	**2**	**2**	0	0	0	0	0	0	0	0
Total Volume	2	0	0	2	0	0	4	4	0	0	0	0	0	0	0	0
% App. Total	100	0	0		0	0	100		0	0	0		0	0	0	
PHF	.500	.000	.000	.500	.000	.000	.500	.500	.000	.000	.000	.000	.000	.000	.000	.000

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268
counts@countsunlimited.com

City of Chino Hills
N/S: Pipeline Avenue
E/W: Soquel Canyon Parkway
Weather: Clear

File Name : 08_CHH_Pipeline_Soquel Cyn_AM
Site Code : 05722517
Start Date : 5/24/2022
Page No : 1

Groups Printed- 3 Axle Vehicles

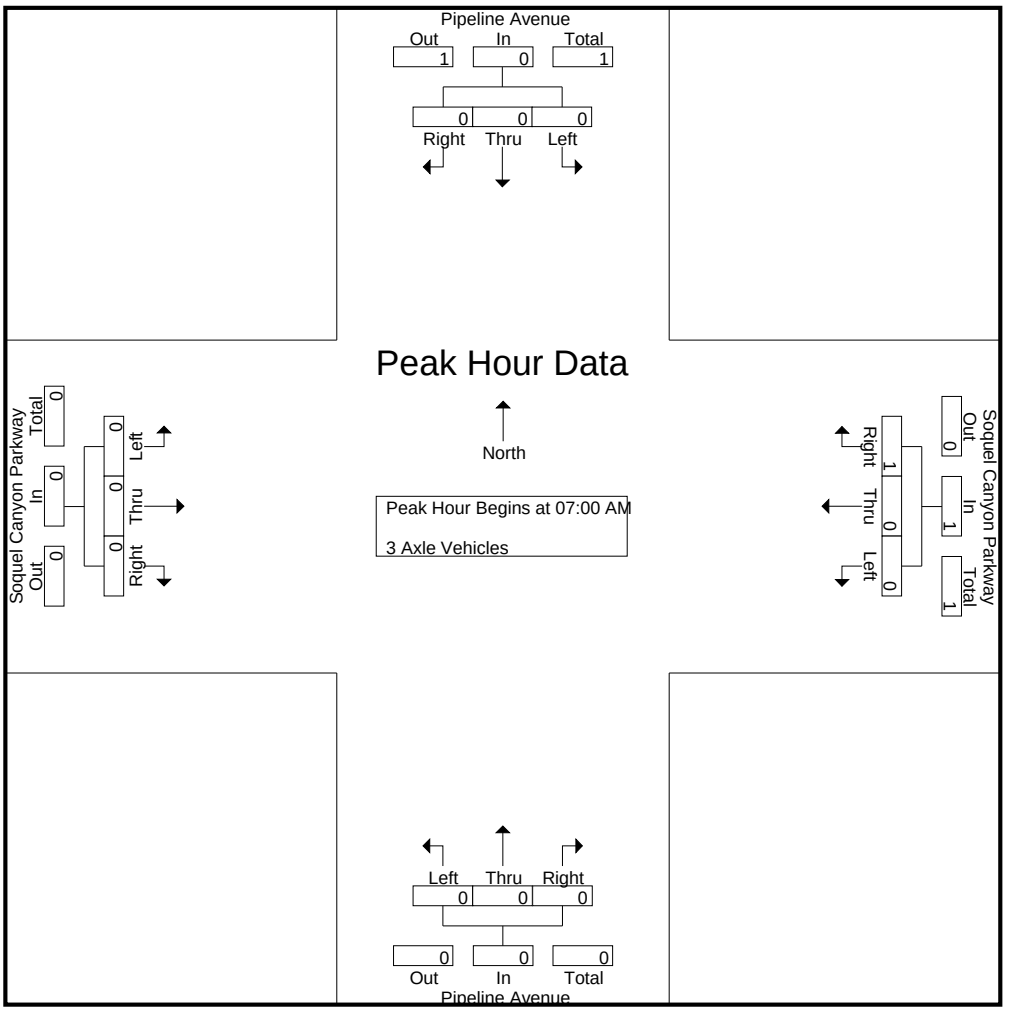
	Pipeline Avenue Southbound				Soquel Canyon Parkway Westbound				Pipeline Avenue Northbound				Soquel Canyon Parkway Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	1
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	1
08:00 AM	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1
Grand Total	0	0	0	0	0	1	1	2	0	0	0	0	0	0	0	0	2
Apprch %	0	0	0		0	50	50		0	0	0		0	0	0		
Total %	0	0	0	0	0	50	50	100	0	0	0	0	0	0	0	0	

	Pipeline Avenue Southbound				Soquel Canyon Parkway Westbound				Pipeline Avenue Northbound				Soquel Canyon Parkway Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 07:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	**1**	**1**	0	0	0	0	0	0	0	0	**1**
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	1
% App. Total	0	0	0		0	0	100		0	0	0		0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.250	.250	.000	.000	.000	.000	.000	.000	.000	.000	.250

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268
counts@countsunlimited.com

City of Chino Hills
N/S: Pipeline Avenue
E/W: Soquel Canyon Parkway
Weather: Clear

File Name : 08_CHH_Pipeline_Soquel Cyn_AM
Site Code : 05722517
Start Date : 5/24/2022



Peak Hour Analysis From 07:00 AM to 07:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:00 AM				07:00 AM				07:00 AM				07:00 AM			
+0 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	**1**	**1**	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0
% App. Total	0	0	0		0	0	100		0	0	0		0	0	0	
PHF	.000	.000	.000	.000	.000	.000	.250	.250	.000	.000	.000	.000	.000	.000	.000	.000

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268
counts@countsunlimited.com

City of Chino Hills
N/S: Pipeline Avenue
E/W: Soquel Canyon Parkway
Weather: Clear

File Name : 08_CHH_Pipeline_Soquel Cyn_AM
Site Code : 05722517
Start Date : 5/24/2022
Page No : 1

Groups Printed- 4+ Axle Trucks

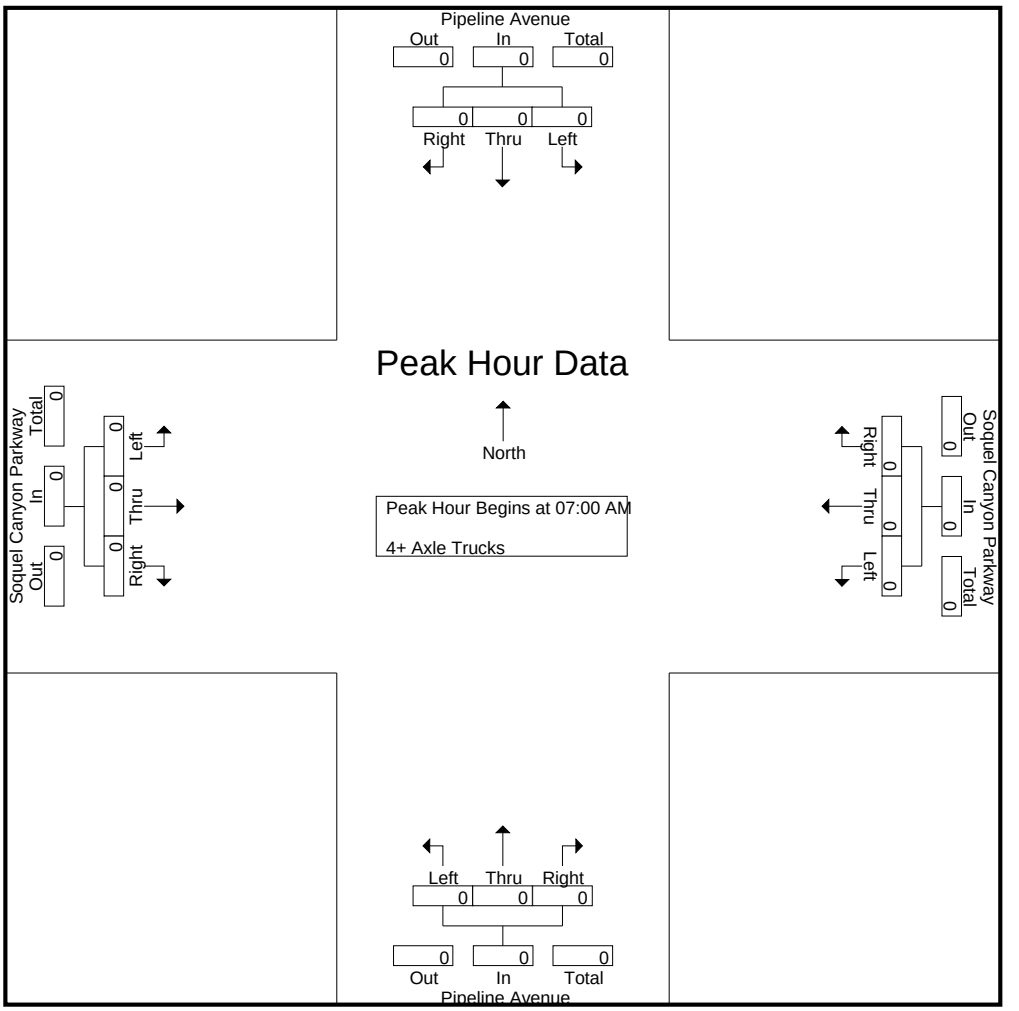
	Pipeline Avenue Southbound				Soquel Canyon Parkway Westbound				Pipeline Avenue Northbound				Soquel Canyon Parkway Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00 AM	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	1
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	1
Grand Total	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	1
Apprch %	0	0	0		0	0	100		0	0	0		0	0	0		
Total %	0	0	0	0	0	0	100	100	0	0	0	0	0	0	0	0	

	Pipeline Avenue Southbound				Soquel Canyon Parkway Westbound				Pipeline Avenue Northbound				Soquel Canyon Parkway Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 07:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0		0	0	0		0	0	0		0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268
counts@countsunlimited.com

City of Chino Hills
N/S: Pipeline Avenue
E/W: Soquel Canyon Parkway
Weather: Clear

File Name : 08_CHH_Pipeline_Soquel Cyn_AM
Site Code : 05722517
Start Date : 5/24/2022



Peak Hour Analysis From 07:00 AM to 07:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:00 AM				07:00 AM				07:00 AM				07:00 AM			
+0 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0		0	0	0		0	0	0		0	0	0	
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268
counts@countsunlimited.com

City of Chino Hills
N/S: Pipeline Avenue
E/W: Soquel Canyon Parkway
Weather: Clear

File Name : 08_CHH_Pipeline_Soquel Cyn_PM
Site Code : 05722517
Start Date : 5/24/2022
Page No : 1

Groups Printed- Passenger Vehicles - Large 2 Axle Vehicles - 3 Axle Vehicles - 4+ Axle Trucks

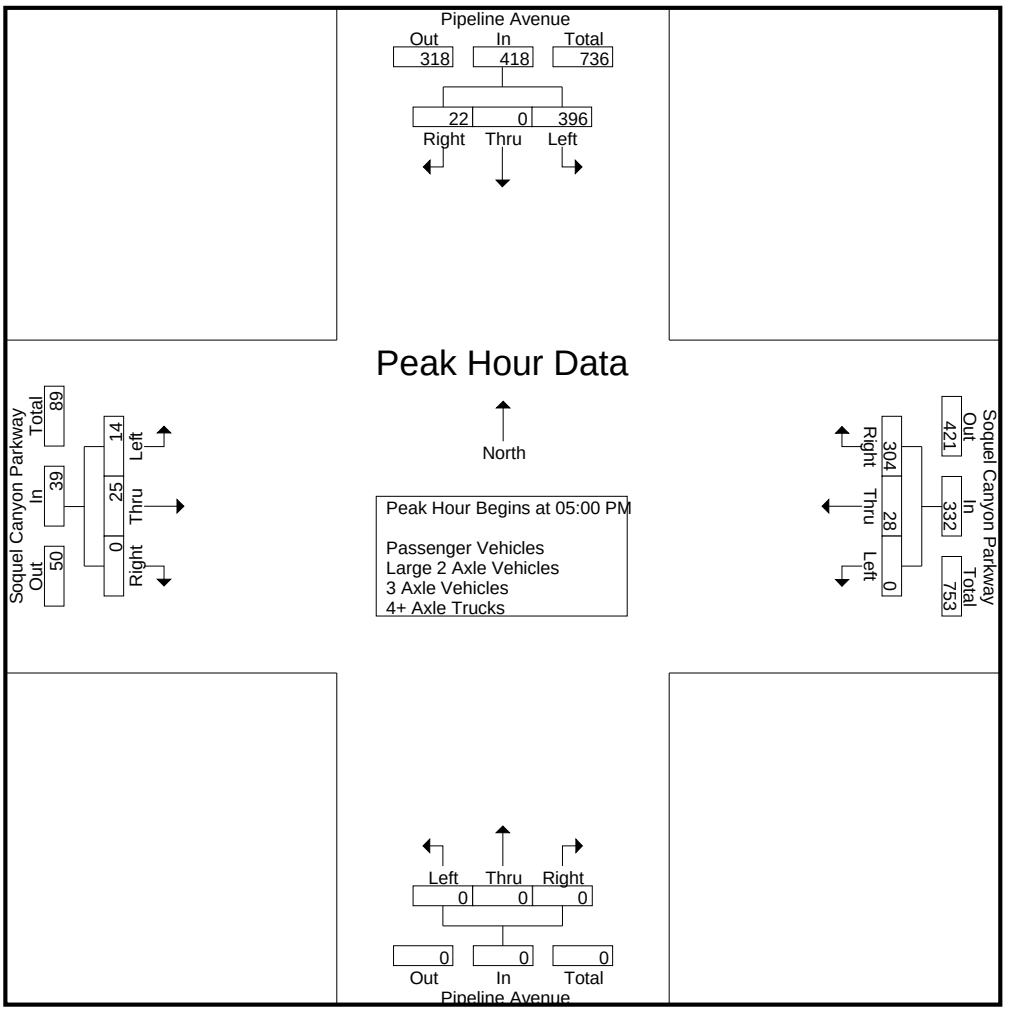
	Pipeline Avenue Southbound				Soquel Canyon Parkway Westbound				Pipeline Avenue Northbound				Soquel Canyon Parkway Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	69	0	3	72	0	8	51	59	0	0	0	0	3	2	0	5	136
04:15 PM	80	0	3	83	0	3	62	65	0	0	0	0	5	8	0	13	161
04:30 PM	85	0	14	99	0	10	67	77	0	0	0	0	6	5	0	11	187
04:45 PM	81	0	4	85	1	3	62	66	0	0	0	0	4	13	0	17	168
Total	315	0	24	339	1	24	242	267	0	0	0	0	18	28	0	46	652
05:00 PM	117	0	4	121	0	7	71	78	0	0	0	0	5	7	0	12	211
05:15 PM	91	0	3	94	0	5	89	94	0	0	0	0	0	8	0	8	196
05:30 PM	93	0	8	101	0	10	79	89	0	0	0	0	5	4	0	9	199
05:45 PM	95	0	7	102	0	6	65	71	0	0	0	0	4	6	0	10	183
Total	396	0	22	418	0	28	304	332	0	0	0	0	14	25	0	39	789
Grand Total	711	0	46	757	1	52	546	599	0	0	0	0	32	53	0	85	1441
Apprch %	93.9	0	6.1		0.2	8.7	91.2		0	0	0		37.6	62.4	0		
Total %	49.3	0	3.2	52.5	0.1	3.6	37.9	41.6	0	0	0	0	2.2	3.7	0	5.9	
Passenger Vehicles	709	0	46	755	1	52	545	598	0	0	0	0	32	52	0	84	1437
% Passenger Vehicles	99.7	0	100	99.7	100	100	99.8	99.8	0	0	0	0	100	98.1	0	98.8	99.7
Large 2 Axle Vehicles	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
% Large 2 Axle Vehicles	0.3	0	0	0.3	0	0	0	0	0	0	0	0	0	0	0	0	0.1
3 Axle Vehicles	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
% 3 Axle Vehicles	0	0	0	0	0	0	0	0	0	0	0	0	0	1.9	0	1.2	0.1
4+ Axle Trucks	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	1
% 4+ Axle Trucks	0	0	0	0	0	0	0.2	0.2	0	0	0	0	0	0	0	0	0.1

	Pipeline Avenue Southbound				Soquel Canyon Parkway Westbound				Pipeline Avenue Northbound				Soquel Canyon Parkway Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	**117**	0	4	**121**	0	7	71	78	0	0	0	0	**5**	7	0	**12**	**211**
05:15 PM	91	0	3	94	0	5	**89**	**94**	0	0	0	0	0	**8**	0	8	196
05:30 PM	93	0	**8**	101	0	**10**	79	89	0	0	0	0	5	4	0	9	199
05:45 PM	95	0	7	102	0	6	65	71	0	0	0	0	4	6	0	10	183
Total Volume	396	0	22	418	0	28	304	332	0	0	0	0	14	25	0	39	789
% App. Total	94.7	0	5.3		0	8.4	91.6		0	0	0		35.9	64.1	0		
PHF	.846	.000	.688	.864	.000	.700	.854	.883	.000	.000	.000	.000	.700	.781	.000	.813	.935

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268
counts@countsunlimited.com

City of Chino Hills
N/S: Pipeline Avenue
E/W: Soquel Canyon Parkway
Weather: Clear

File Name : 08_CHH_Pipeline_Soquel Cyn_PM
Site Code : 05722517
Start Date : 5/24/2022



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	05:00 PM				05:00 PM				04:00 PM				04:15 PM			
+0 mins.	**117**	0	4	**121**	0	7	71	78	0	0	0	0	5	8	0	13
+15 mins.	91	0	3	94	0	5	**89**	**94**	0	0	0	0	**6**	5	0	11
+30 mins.	93	0	**8**	101	0	**10**	79	89	0	0	0	0	4	**13**	0	**17**
+45 mins.	95	0	7	102	0	6	65	71	0	0	0	0	5	7	0	12
Total Volume	396	0	22	418	0	28	304	332	0	0	0	0	20	33	0	53
% App. Total	94.7	0	5.3		0	8.4	91.6		0	0	0		37.7	62.3	0	
PHF	.846	.000	.688	.864	.000	.700	.854	.883	.000	.000	.000	.000	.833	.635	.000	.779

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268
counts@countsunlimited.com

City of Chino Hills
N/S: Pipeline Avenue
E/W: Soquel Canyon Parkway
Weather: Clear

File Name : 08_CHH_Pipeline_Soquel Cyn_PM
Site Code : 05722517
Start Date : 5/24/2022
Page No : 1

Groups Printed- Passenger Vehicles

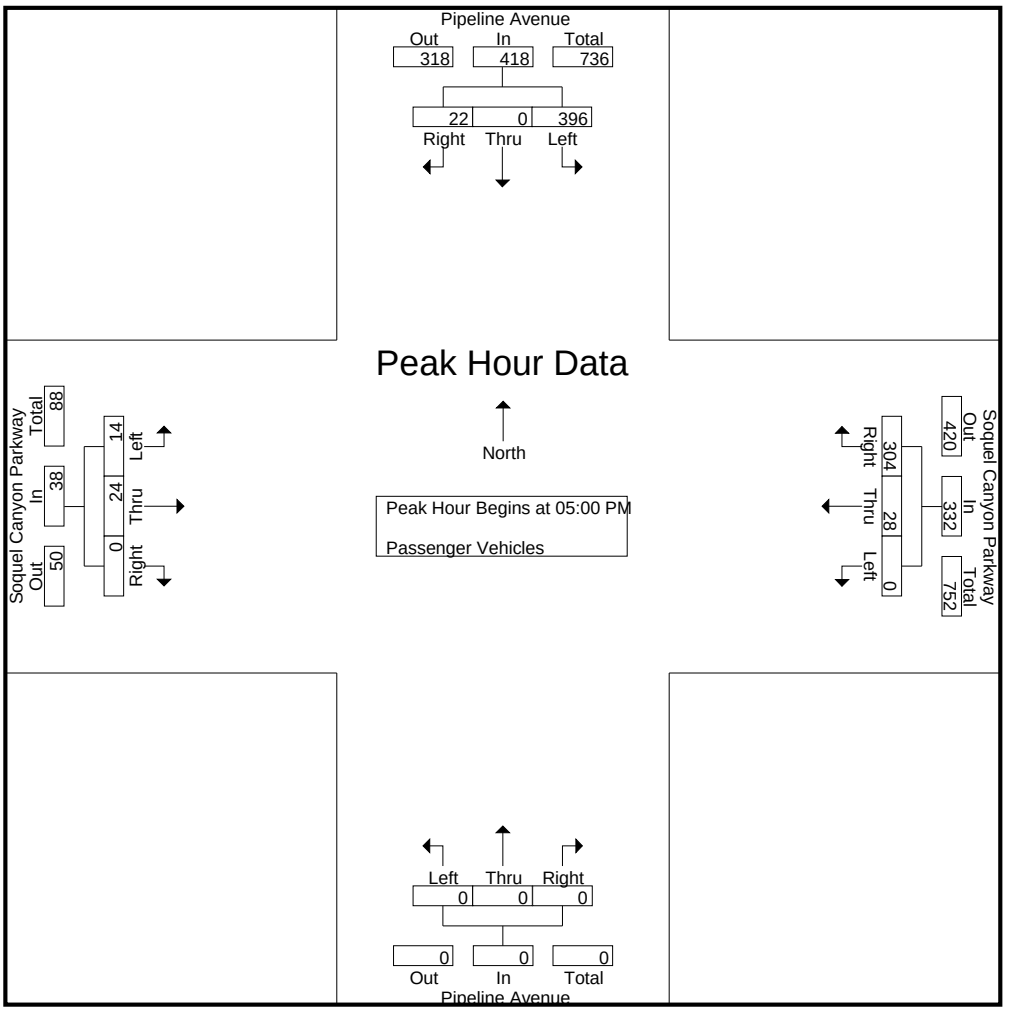
	Pipeline Avenue Southbound				Soquel Canyon Parkway Westbound				Pipeline Avenue Northbound				Soquel Canyon Parkway Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	67	0	3	70	0	8	51	59	0	0	0	0	3	2	0	5	134
04:15 PM	80	0	3	83	0	3	62	65	0	0	0	0	5	8	0	13	161
04:30 PM	85	0	14	99	0	10	66	76	0	0	0	0	6	5	0	11	186
04:45 PM	81	0	4	85	1	3	62	66	0	0	0	0	4	13	0	17	168
Total	313	0	24	337	1	24	241	266	0	0	0	0	18	28	0	46	649
05:00 PM	117	0	4	121	0	7	71	78	0	0	0	0	5	6	0	11	210
05:15 PM	91	0	3	94	0	5	89	94	0	0	0	0	0	8	0	8	196
05:30 PM	93	0	8	101	0	10	79	89	0	0	0	0	5	4	0	9	199
05:45 PM	95	0	7	102	0	6	65	71	0	0	0	0	4	6	0	10	183
Total	396	0	22	418	0	28	304	332	0	0	0	0	14	24	0	38	788
Grand Total	709	0	46	755	1	52	545	598	0	0	0	0	32	52	0	84	1437
Apprch %	93.9	0	6.1		0.2	8.7	91.1		0	0	0		38.1	61.9	0		
Total %	49.3	0	3.2	52.5	0.1	3.6	37.9	41.6	0	0	0	0	2.2	3.6	0	5.8	

	Pipeline Avenue Southbound				Soquel Canyon Parkway Westbound				Pipeline Avenue Northbound				Soquel Canyon Parkway Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 05:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	**117**	0	4	**121**	0	7	71	78	0	0	0	0	**5**	6	0	**11**	**210**
05:15 PM	91	0	3	94	0	5	**89**	**94**	0	0	0	0	0	**8**	0	8	196
05:30 PM	93	0	**8**	101	0	**10**	79	89	0	0	0	0	5	4	0	9	199
05:45 PM	95	0	7	102	0	6	65	71	0	0	0	0	4	6	0	10	183
Total Volume	396	0	22	418	0	28	304	332	0	0	0	0	14	24	0	38	788
% App. Total	94.7	0	5.3		0	8.4	91.6		0	0	0		36.8	63.2	0		
PHF	.846	.000	.688	.864	.000	.700	.854	.883	.000	.000	.000	.000	.700	.750	.000	.864	.938

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268
counts@countsunlimited.com

City of Chino Hills
N/S: Pipeline Avenue
E/W: Soquel Canyon Parkway
Weather: Clear

File Name : 08_CHH_Pipeline_Soquel Cyn_PM
Site Code : 05722517
Start Date : 5/24/2022



Peak Hour Analysis From 05:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	05:00 PM				05:00 PM				05:00 PM				05:00 PM			
+0 mins.	**117**	0	4	**121**	0	7	71	78	0	0	0	0	**5**	6	0	**11**
+15 mins.	91	0	3	94	0	5	**89**	**94**	0	0	0	0	0	**8**	0	8
+30 mins.	93	0	**8**	101	0	**10**	79	89	0	0	0	0	5	4	0	9
+45 mins.	95	0	7	102	0	6	65	71	0	0	0	0	4	6	0	10
Total Volume	396	0	22	418	0	28	304	332	0	0	0	0	14	24	0	38
% App. Total	94.7	0	5.3		0	8.4	91.6		0	0	0		36.8	63.2	0	
PHF	.846	.000	.688	.864	.000	.700	.854	.883	.000	.000	.000	.000	.700	.750	.000	.864

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268
counts@countsunlimited.com

City of Chino Hills
N/S: Pipeline Avenue
E/W: Soquel Canyon Parkway
Weather: Clear

File Name : 08_CHH_Pipeline_Soquel Cyn_PM
Site Code : 05722517
Start Date : 5/24/2022
Page No : 1

Groups Printed- Large 2 Axle Vehicles

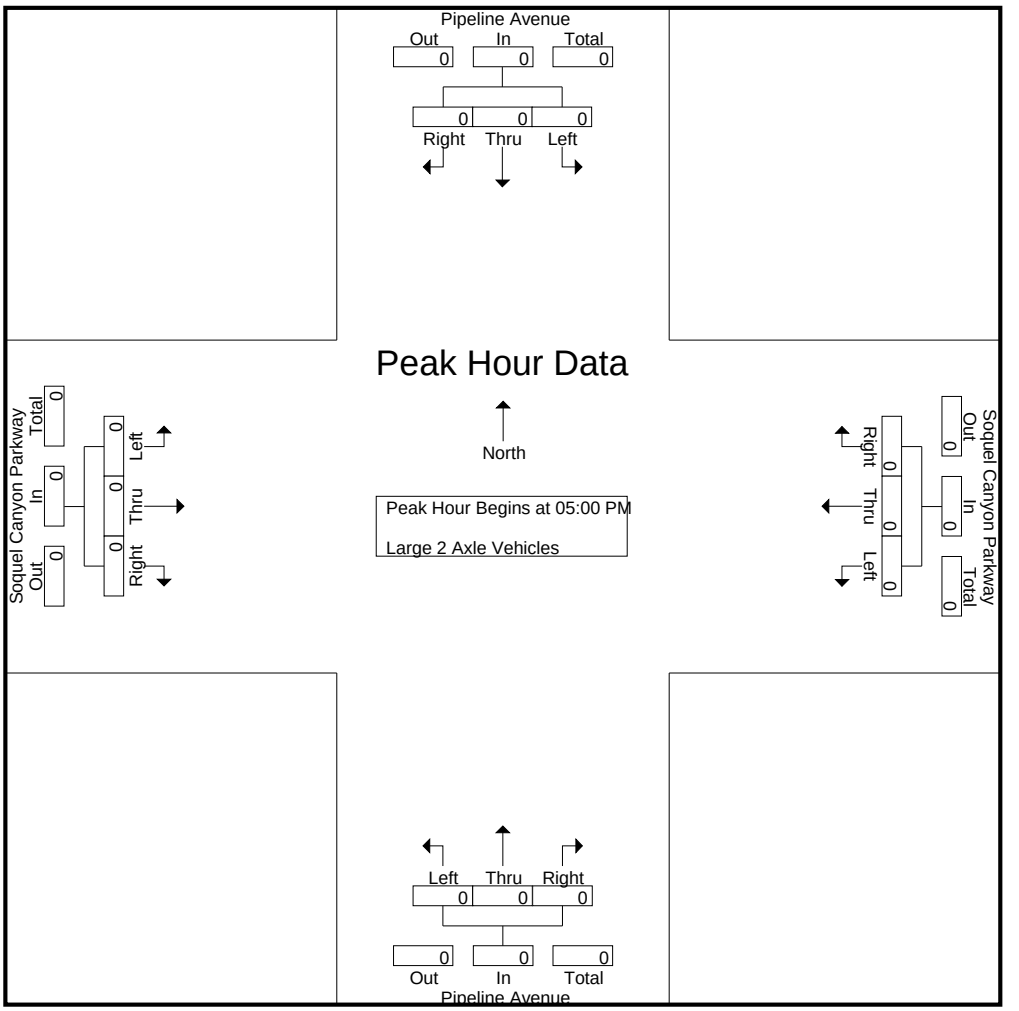
	Pipeline Avenue Southbound				Soquel Canyon Parkway Westbound				Pipeline Avenue Northbound				Soquel Canyon Parkway Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
Apprch %	100	0	0		0	0	0		0	0	0		0	0	0		
Total %	100	0	0	100	0	0	0	0	0	0	0	0	0	0	0	0	

	Pipeline Avenue Southbound				Soquel Canyon Parkway Westbound				Pipeline Avenue Northbound				Soquel Canyon Parkway Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 05:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0		0	0	0		0	0	0		0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268
counts@countsunlimited.com

City of Chino Hills
N/S: Pipeline Avenue
E/W: Soquel Canyon Parkway
Weather: Clear

File Name : 08_CHH_Pipeline_Soquel Cyn_PM
Site Code : 05722517
Start Date : 5/24/2022



Peak Hour Analysis From 05:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	05:00 PM				05:00 PM				05:00 PM				05:00 PM			
+0 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0		0	0	0		0	0	0		0	0	0	
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268
counts@countsunlimited.com

City of Chino Hills
N/S: Pipeline Avenue
E/W: Soquel Canyon Parkway
Weather: Clear

File Name : 08_CHH_Pipeline_Soquel Cyn_PM
Site Code : 05722517
Start Date : 5/24/2022
Page No : 1

Groups Printed- 3 Axle Vehicles

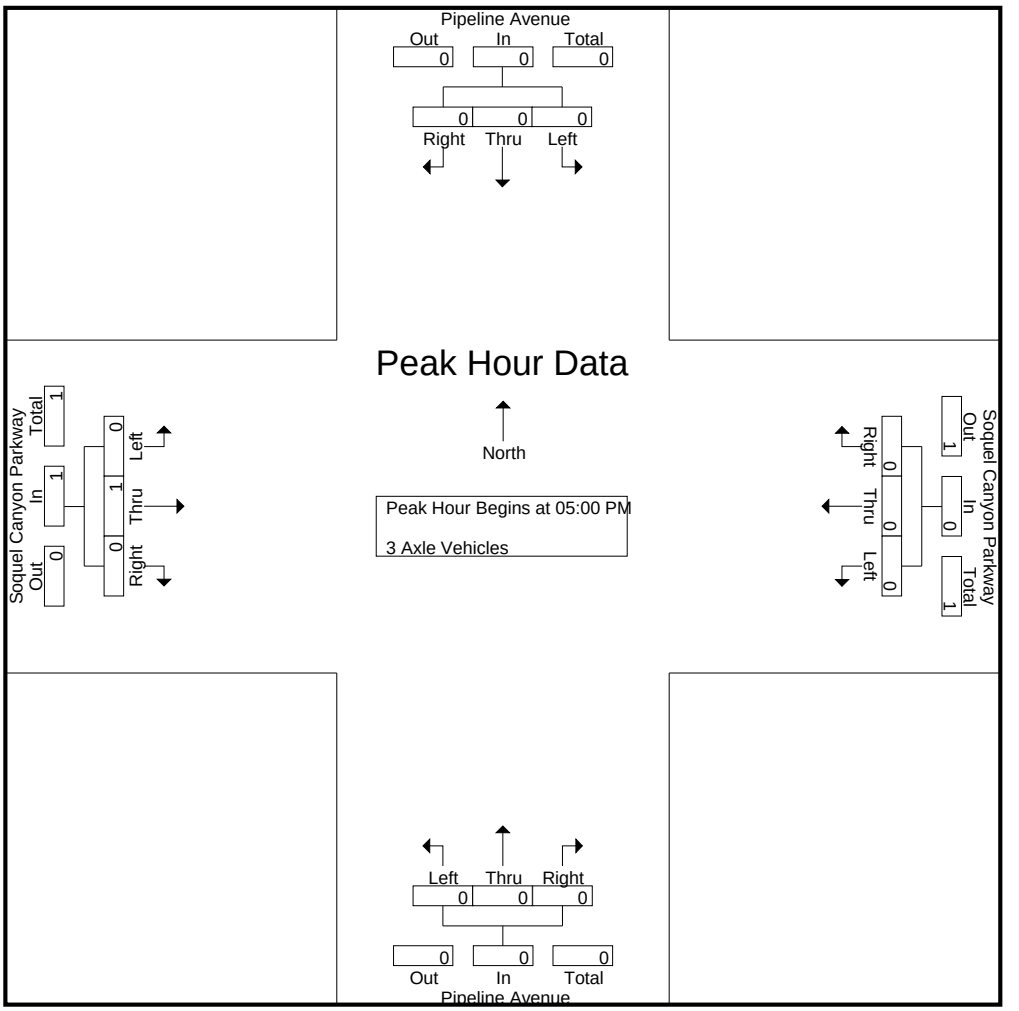
	Pipeline Avenue Southbound				Soquel Canyon Parkway Westbound				Pipeline Avenue Northbound				Soquel Canyon Parkway Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
Apprch %	0	0	0		0	0	0		0	0	0		0	100	0		
Total %	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	100	

	Pipeline Avenue Southbound				Soquel Canyon Parkway Westbound				Pipeline Avenue Northbound				Soquel Canyon Parkway Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 05:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	**1**	0	**1**	**1**
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
% App. Total	0	0	0		0	0	0		0	0	0		0	100	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.250	.000	.250	.250

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268
counts@countsunlimited.com

City of Chino Hills
N/S: Pipeline Avenue
E/W: Soquel Canyon Parkway
Weather: Clear

File Name : 08_CHH_Pipeline_Soquel Cyn_PM
Site Code : 05722517
Start Date : 5/24/2022



Peak Hour Analysis From 05:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	05:00 PM				05:00 PM				05:00 PM				05:00 PM			
+0 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	**1**	0	**1**
+15 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
% App. Total	0	0	0		0	0	0		0	0	0		0	100	0	
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.250	.000	.250

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268
counts@countsunlimited.com

City of Chino Hills
N/S: Pipeline Avenue
E/W: Soquel Canyon Parkway
Weather: Clear

File Name : 08_CHH_Pipeline_Soquel Cyn_PM
Site Code : 05722517
Start Date : 5/24/2022
Page No : 1

Groups Printed- 4+ Axle Trucks

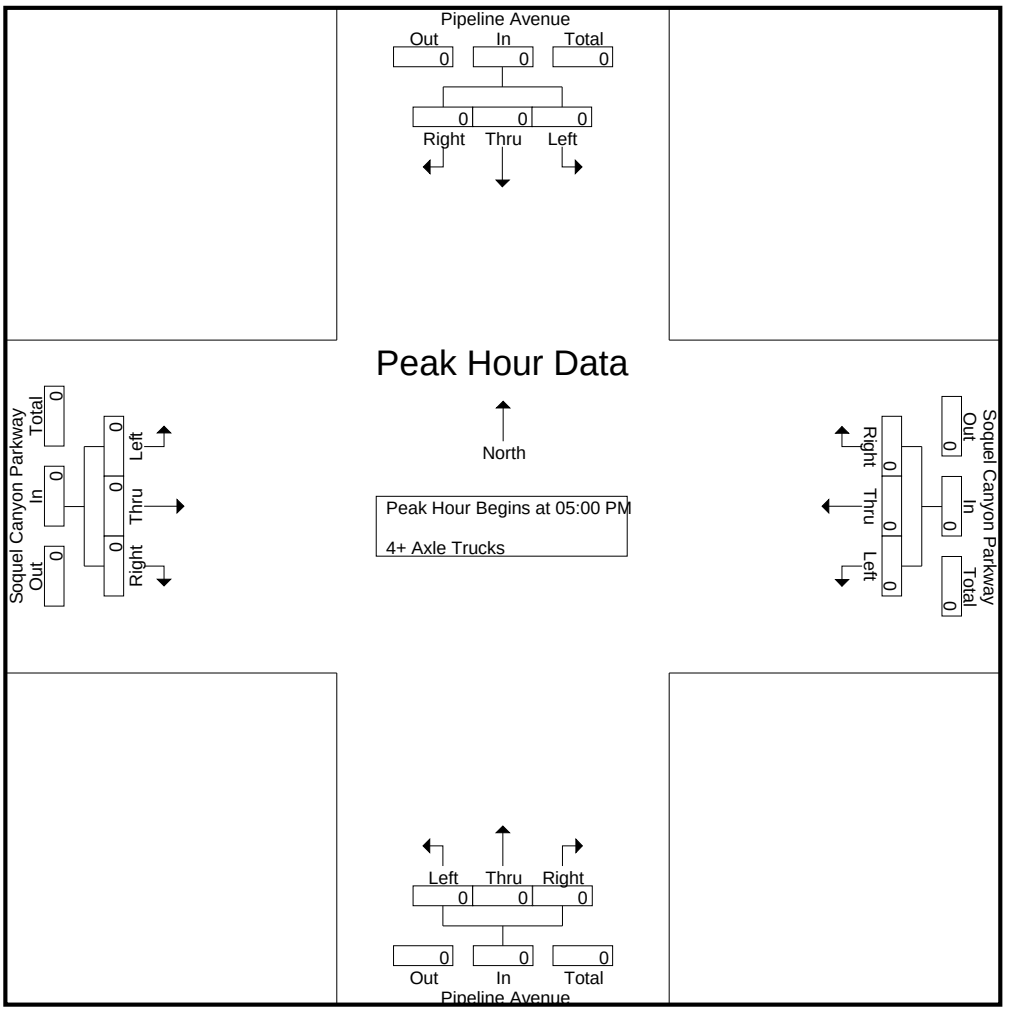
	Pipeline Avenue Southbound				Soquel Canyon Parkway Westbound				Pipeline Avenue Northbound				Soquel Canyon Parkway Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	1
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	1
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	1
Apprch %	0	0	0		0	0	100		0	0	0		0	0	0		
Total %	0	0	0	0	0	0	100	100	0	0	0	0	0	0	0	0	

	Pipeline Avenue Southbound				Soquel Canyon Parkway Westbound				Pipeline Avenue Northbound				Soquel Canyon Parkway Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 05:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0		0	0	0		0	0	0		0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268
counts@countsunlimited.com

City of Chino Hills
N/S: Pipeline Avenue
E/W: Soquel Canyon Parkway
Weather: Clear

File Name : 08_CHH_Pipeline_Soquel Cyn_PM
Site Code : 05722517
Start Date : 5/24/2022
Page No : 2



Peak Hour Analysis From 05:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	05:00 PM				05:00 PM				05:00 PM				05:00 PM			
+0 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0		0	0	0		0	0	0		0	0	0	
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268
counts@countsunlimited.com

City of Chino Hills
N/S: Soquel Canyon Parkway
E/W: Butterfield Ranch Road
Weather: Clear

File Name : 09_CHH_Soquel Cyn_Butterfield_AM
Site Code : 05722517
Start Date : 5/24/2022
Page No : 1

Groups Printed- Passenger Vehicles - Large 2 Axle Vehicles - 3 Axle Vehicles - 4+ Axle Trucks

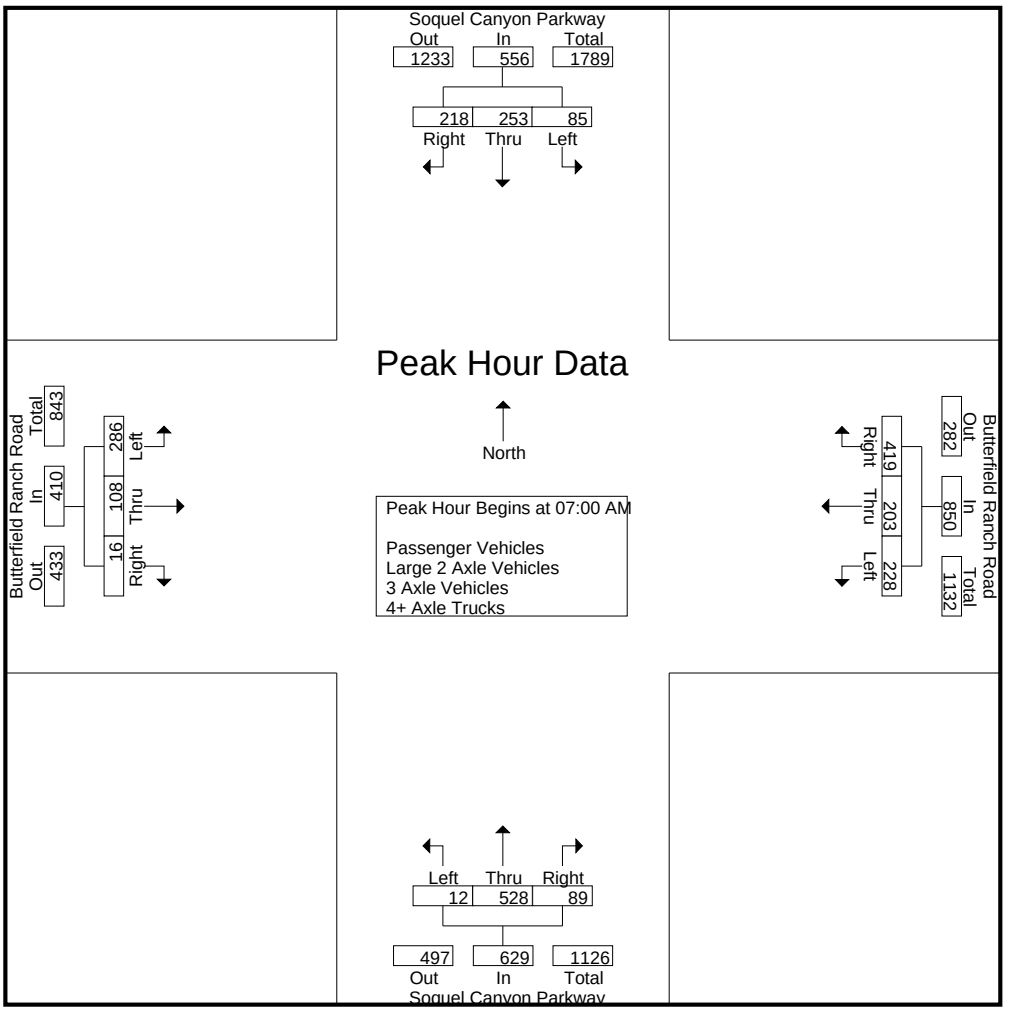
	Soquel Canyon Parkway Southbound				Butterfield Ranch Road Westbound				Soquel Canyon Parkway Northbound				Butterfield Ranch Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	44	67	40	151	99	82	165	346	2	194	34	230	79	41	5	125	852
07:15 AM	18	69	43	130	98	60	127	285	2	137	20	159	65	18	4	87	661
07:30 AM	11	56	53	120	16	22	73	111	2	98	24	124	66	20	1	87	442
07:45 AM	12	61	82	155	15	39	54	108	6	99	11	116	76	29	6	111	490
Total	85	253	218	556	228	203	419	850	12	528	89	629	286	108	16	410	2445
08:00 AM	25	114	56	195	47	20	49	116	8	118	14	140	84	35	6	125	576
08:15 AM	32	63	41	136	33	15	68	116	12	161	20	193	56	21	6	83	528
08:30 AM	22	51	48	121	19	31	51	101	7	126	19	152	71	20	2	93	467
08:45 AM	20	57	38	115	17	22	58	97	4	99	13	116	62	32	7	101	429
Total	99	285	183	567	116	88	226	430	31	504	66	601	273	108	21	402	2000
Grand Total	184	538	401	1123	344	291	645	1280	43	1032	155	1230	559	216	37	812	4445
Apprch %	16.4	47.9	35.7		26.9	22.7	50.4		3.5	83.9	12.6		68.8	26.6	4.6		
Total %	4.1	12.1	9	25.3	7.7	6.5	14.5	28.8	1	23.2	3.5	27.7	12.6	4.9	0.8	18.3	
Passenger Vehicles	182	524	395	1101	340	288	640	1268	43	1026	153	1222	550	215	35	800	4391
% Passenger Vehicles	98.9	97.4	98.5	98	98.8	99	99.2	99.1	100	99.4	98.7	99.3	98.4	99.5	94.6	98.5	98.8
Large 2 Axle Vehicles	2	11	6	19	4	3	5	12	0	5	2	7	8	1	2	11	49
% Large 2 Axle Vehicles	1.1	2	1.5	1.7	1.2	1	0.8	0.9	0	0.5	1.3	0.6	1.4	0.5	5.4	1.4	1.1
3 Axle Vehicles	0	1	0	1	0	0	0	0	0	1	0	1	0	0	0	0	2
% 3 Axle Vehicles	0	0.2	0	0.1	0	0	0	0	0	0.1	0	0.1	0	0	0	0	0
4+ Axle Trucks	0	2	0	2	0	0	0	0	0	0	0	0	1	0	0	1	3
% 4+ Axle Trucks	0	0.4	0	0.2	0	0	0	0	0	0	0	0	0.2	0	0	0.1	0.1

	Soquel Canyon Parkway Southbound				Butterfield Ranch Road Westbound				Soquel Canyon Parkway Northbound				Butterfield Ranch Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	**44**	67	40	151	**99**	**82**	**165**	**346**	2	**194**	**34**	**230**	**79**	**41**	5	**125**	**852**
07:15 AM	18	**69**	43	130	98	60	127	285	2	137	20	159	65	18	4	87	661
07:30 AM	11	56	53	120	16	22	73	111	2	98	24	124	66	20	1	87	442
07:45 AM	12	61	**82**	**155**	15	39	54	108	**6**	99	11	116	76	29	**6**	111	490
Total Volume	85	253	218	556	228	203	419	850	12	528	89	629	286	108	16	410	2445
% App. Total	15.3	45.5	39.2		26.8	23.9	49.3		1.9	83.9	14.1		69.8	26.3	3.9		
PHF	.483	.917	.665	.897	.576	.619	.635	.614	.500	.680	.654	.684	.905	.659	.667	.820	.717

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268
counts@countsunlimited.com

City of Chino Hills
N/S: Soquel Canyon Parkway
E/W: Butterfield Ranch Road
Weather: Clear

File Name : 09_CHH_Soquel Cyn_Butterfield_AM
Site Code : 05722517
Start Date : 5/24/2022



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:45 AM				07:00 AM				07:00 AM				07:45 AM			
+0 mins.	12	61	**82**	155	**99**	**82**	**165**	**346**	2	**194**	**34**	**230**	76	29	**6**	111
+15 mins.	25	**114**	56	**195**	98	60	127	285	2	137	20	159	**84**	**35**	6	**125**
+30 mins.	**32**	63	41	136	16	22	73	111	2	98	24	124	56	21	6	83
+45 mins.	22	51	48	121	15	39	54	108	**6**	99	11	116	71	20	2	93
Total Volume	91	289	227	607	228	203	419	850	12	528	89	629	287	105	20	412
% App. Total	15	47.6	37.4		26.8	23.9	49.3		1.9	83.9	14.1		69.7	25.5	4.9	
PHF	.711	.634	.692	.778	.576	.619	.635	.614	.500	.680	.654	.684	.854	.750	.833	.824

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268
counts@countsunlimited.com

City of Chino Hills
N/S: Soquel Canyon Parkway
E/W: Butterfield Ranch Road
Weather: Clear

File Name : 09_CHH_Soquel Cyn_Butterfield_AM
Site Code : 05722517
Start Date : 5/24/2022
Page No : 1

Groups Printed- Passenger Vehicles

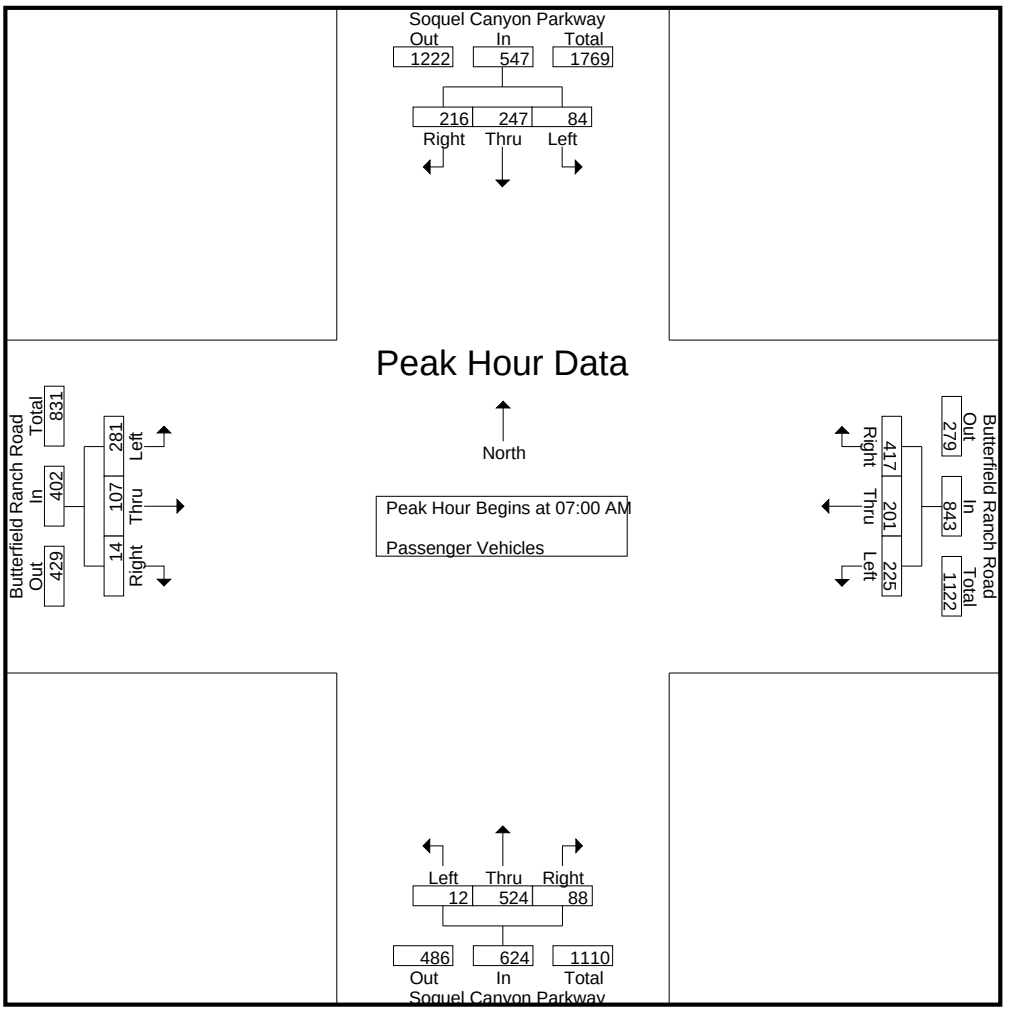
	Soquel Canyon Parkway Southbound				Butterfield Ranch Road Westbound				Soquel Canyon Parkway Northbound				Butterfield Ranch Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	44	66	40	150	97	82	165	344	2	192	34	228	78	41	5	124	846
07:15 AM	18	69	43	130	98	60	126	284	2	137	20	159	63	18	4	85	658
07:30 AM	10	52	53	115	15	22	73	110	2	96	23	121	66	19	1	86	432
07:45 AM	12	60	80	152	15	37	53	105	6	99	11	116	74	29	4	107	480
Total	84	247	216	547	225	201	417	843	12	524	88	624	281	107	14	402	2416
08:00 AM	25	110	56	191	46	20	48	114	8	117	14	139	83	35	6	124	568
08:15 AM	32	61	41	134	33	15	66	114	12	161	20	193	55	21	6	82	523
08:30 AM	22	51	46	119	19	30	51	100	7	125	19	151	71	20	2	93	463
08:45 AM	19	55	36	110	17	22	58	97	4	99	12	115	60	32	7	99	421
Total	98	277	179	554	115	87	223	425	31	502	65	598	269	108	21	398	1975
Grand Total	182	524	395	1101	340	288	640	1268	43	1026	153	1222	550	215	35	800	4391
Apprch %	16.5	47.6	35.9		26.8	22.7	50.5		3.5	84	12.5		68.8	26.9	4.4		
Total %	4.1	11.9	9	25.1	7.7	6.6	14.6	28.9	1	23.4	3.5	27.8	12.5	4.9	0.8	18.2	

	Soquel Canyon Parkway Southbound				Butterfield Ranch Road Westbound				Soquel Canyon Parkway Northbound				Butterfield Ranch Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 07:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	**44**	66	40	150	97	**82**	**165**	**344**	2	**192**	**34**	**228**	**78**	**41**	**5**	**124**	**846**
07:15 AM	18	**69**	43	130	**98**	60	126	284	2	137	20	159	63	18	4	85	658
07:30 AM	10	52	53	115	15	22	73	110	2	96	23	121	66	19	1	86	432
07:45 AM	12	60	**80**	**152**	15	37	53	105	**6**	99	11	116	74	29	4	107	480
Total Volume	84	247	216	547	225	201	417	843	12	524	88	624	281	107	14	402	2416
% App. Total	15.4	45.2	39.5		26.7	23.8	49.5		1.9	84	14.1		69.9	26.6	3.5		
PHF	.477	.895	.675	.900	.574	.613	.632	.613	.500	.682	.647	.684	.901	.652	.700	.810	.714

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268
counts@countsunlimited.com

City of Chino Hills
N/S: Soquel Canyon Parkway
E/W: Butterfield Ranch Road
Weather: Clear

File Name : 09_CHH_Soquel Cyn_Butterfield_AM
Site Code : 05722517
Start Date : 5/24/2022



Peak Hour Analysis From 07:00 AM to 07:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:00 AM				07:00 AM				07:00 AM				07:00 AM			
+0 mins.	**44**	66	40	150	97	**82**	**165**	**344**	2	**192**	**34**	**228**	**78**	**41**	**5**	**124**
+15 mins.	18	**69**	43	130	**98**	60	126	284	2	137	20	159	63	18	4	85
+30 mins.	10	52	53	115	15	22	73	110	2	96	23	121	66	19	1	86
+45 mins.	12	60	**80**	**152**	15	37	53	105	**6**	99	11	116	74	29	4	107
Total Volume	84	247	216	547	225	201	417	843	12	524	88	624	281	107	14	402
% App. Total	15.4	45.2	39.5		26.7	23.8	49.5		1.9	84	14.1		69.9	26.6	3.5	
PHF	.477	.895	.675	.900	.574	.613	.632	.613	.500	.682	.647	.684	.901	.652	.700	.810

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268
counts@countsunlimited.com

City of Chino Hills
N/S: Soquel Canyon Parkway
E/W: Butterfield Ranch Road
Weather: Clear

File Name : 09_CHH_Soquel Cyn_Butterfield_AM
Site Code : 05722517
Start Date : 5/24/2022
Page No : 1

Groups Printed- Large 2 Axle Vehicles

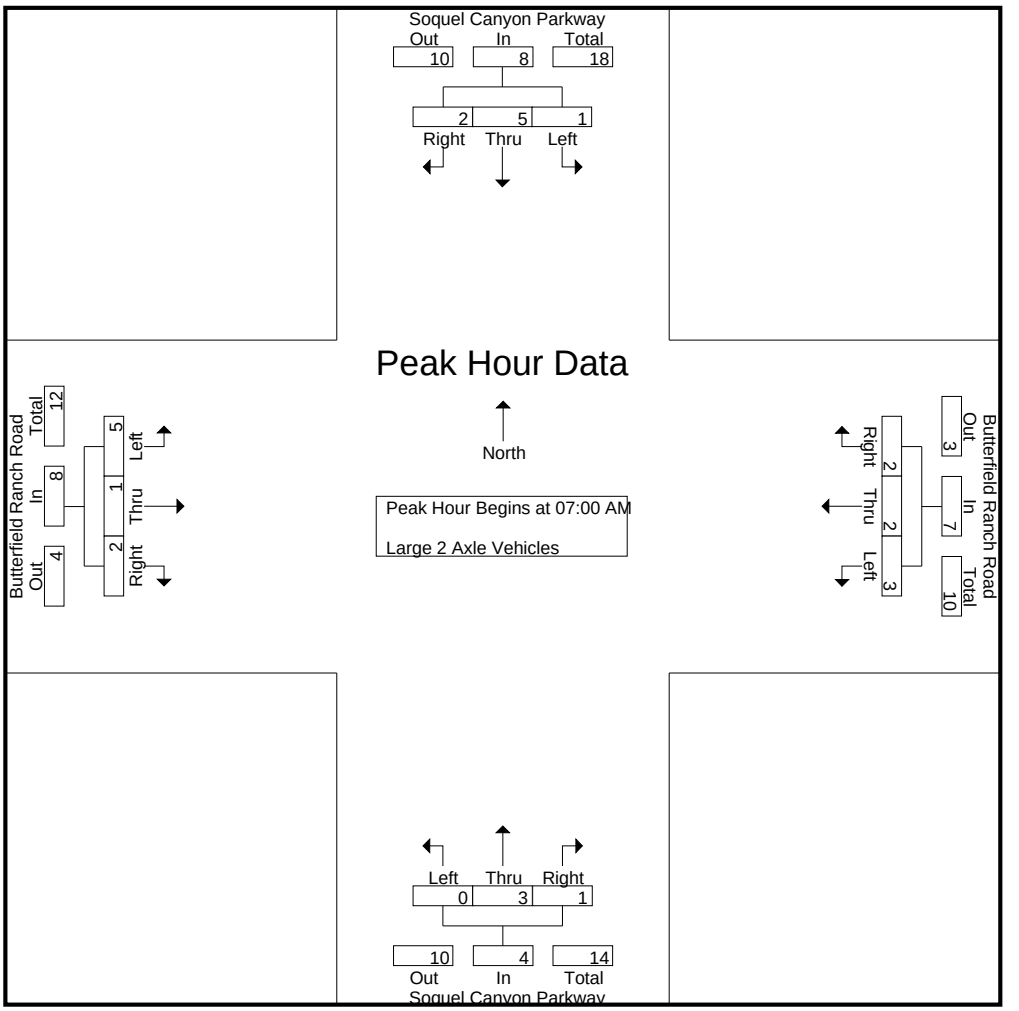
	Soquel Canyon Parkway Southbound				Butterfield Ranch Road Westbound				Soquel Canyon Parkway Northbound				Butterfield Ranch Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	0	1	0	1	2	0	0	2	0	2	0	2	1	0	0	1	6
07:15 AM	0	0	0	0	0	0	1	1	0	0	0	0	2	0	0	2	3
07:30 AM	1	3	0	4	1	0	0	1	0	1	1	2	0	1	0	1	8
07:45 AM	0	1	2	3	0	2	1	3	0	0	0	0	2	0	2	4	10
Total	1	5	2	8	3	2	2	7	0	3	1	4	5	1	2	8	27
08:00 AM	0	2	0	2	1	0	1	2	0	1	0	1	1	0	0	1	6
08:15 AM	0	2	0	2	0	0	2	2	0	0	0	0	1	0	0	1	5
08:30 AM	0	0	2	2	0	1	0	1	0	1	0	1	0	0	0	0	4
08:45 AM	1	2	2	5	0	0	0	0	0	0	1	1	1	0	0	1	7
Total	1	6	4	11	1	1	3	5	0	2	1	3	3	0	0	3	22
Grand Total	2	11	6	19	4	3	5	12	0	5	2	7	8	1	2	11	49
Apprch %	10.5	57.9	31.6		33.3	25	41.7		0	71.4	28.6		72.7	9.1	18.2		
Total %	4.1	22.4	12.2	38.8	8.2	6.1	10.2	24.5	0	10.2	4.1	14.3	16.3	2	4.1	22.4	

	Soquel Canyon Parkway Southbound				Butterfield Ranch Road Westbound				Soquel Canyon Parkway Northbound				Butterfield Ranch Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 07:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	0	1	0	1	**2**	0	0	2	0	**2**	0	**2**	1	0	0	1	6
07:15 AM	0	0	0	0	0	0	**1**	1	0	0	0	0	**2**	0	0	2	3
07:30 AM	**1**	**3**	0	**4**	1	0	0	1	0	1	**1**	2	0	**1**	0	1	8
07:45 AM	0	1	**2**	3	0	**2**	1	**3**	0	0	0	0	2	0	**2**	**4**	**10**
Total Volume	1	5	2	8	3	2	2	7	0	3	1	4	5	1	2	8	27
% App. Total	12.5	62.5	25		42.9	28.6	28.6		0	75	25		62.5	12.5	25		
PHF	.250	.417	.250	.500	.375	.250	.500	.583	.000	.375	.250	.500	.625	.250	.250	.500	.675

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268
counts@countsunlimited.com

City of Chino Hills
N/S: Soquel Canyon Parkway
E/W: Butterfield Ranch Road
Weather: Clear

File Name : 09_CHH_Soquel Cyn_Butterfield_AM
Site Code : 05722517
Start Date : 5/24/2022
Page No : 2



Peak Hour Analysis From 07:00 AM to 07:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:00 AM				07:00 AM				07:00 AM				07:00 AM			
+0 mins.	0	1	0	1	**2**	0	0	2	0	**2**	0	**2**	1	0	0	1
+15 mins.	0	0	0	0	0	0	**1**	1	0	0	0	0	**2**	0	0	2
+30 mins.	**1**	**3**	0	**4**	1	0	0	1	0	1	**1**	2	0	**1**	0	1
+45 mins.	0	1	**2**	3	0	**2**	1	**3**	0	0	0	0	2	0	**2**	**4**
Total Volume	1	5	2	8	3	2	2	7	0	3	1	4	5	1	2	8
% App. Total	12.5	62.5	25		42.9	28.6	28.6		0	75	25		62.5	12.5	25	
PHF	.250	.417	.250	.500	.375	.250	.500	.583	.000	.375	.250	.500	.625	.250	.250	.500

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268
counts@countsunlimited.com

City of Chino Hills
N/S: Soquel Canyon Parkway
E/W: Butterfield Ranch Road
Weather: Clear

File Name : 09_CHH_Soquel Cyn_Butterfield_AM
Site Code : 05722517
Start Date : 5/24/2022
Page No : 1

Groups Printed- 3 Axle Vehicles

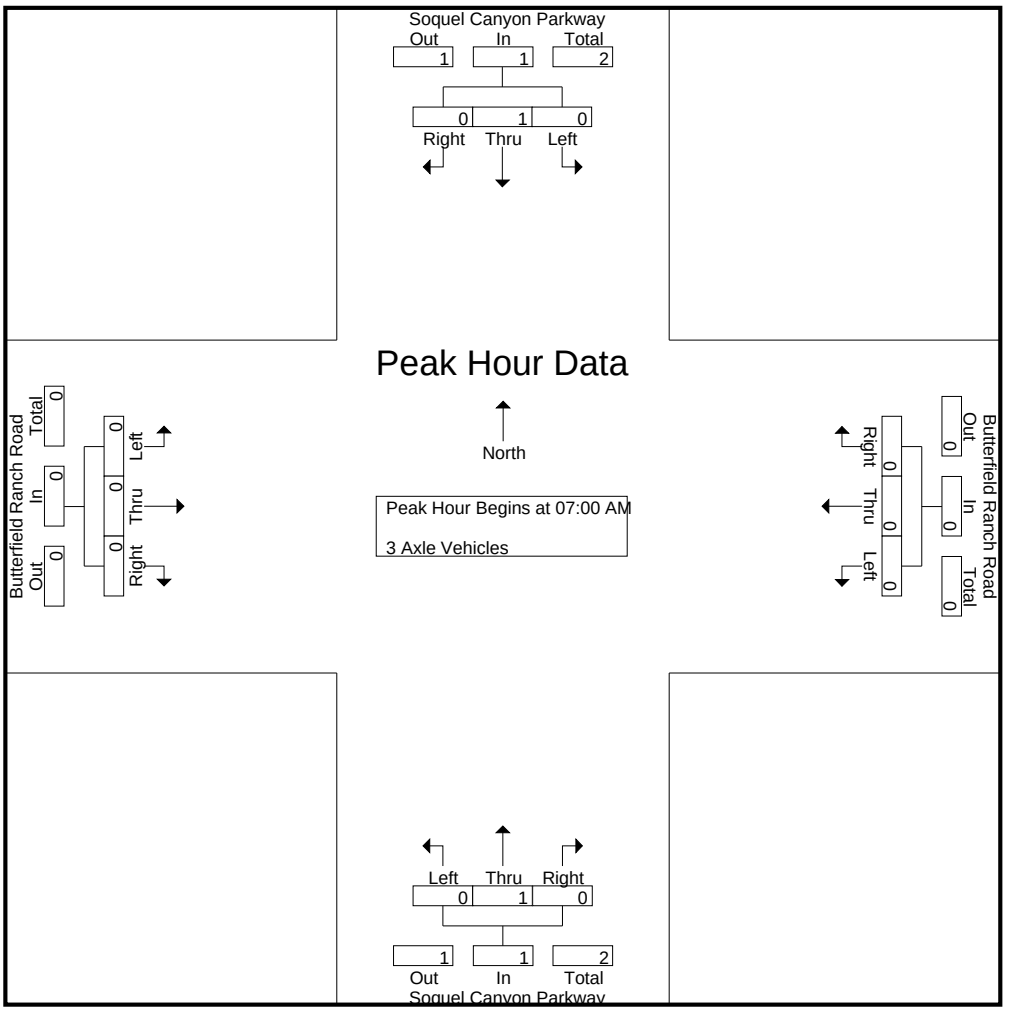
	Soquel Canyon Parkway Southbound				Butterfield Ranch Road Westbound				Soquel Canyon Parkway Northbound				Butterfield Ranch Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	1	0	1	0	0	0	0	0	1	0	1	0	0	0	0	2
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	1	0	1	0	0	0	0	0	1	0	1	0	0	0	0	2
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	1	0	1	0	0	0	0	0	1	0	1	0	0	0	0	2
Apprch %	0	100	0		0	0	0		0	100	0		0	0	0		
Total %	0	50	0	50	0	0	0	0	0	50	0	50	0	0	0	0	

	Soquel Canyon Parkway Southbound				Butterfield Ranch Road Westbound				Soquel Canyon Parkway Northbound				Butterfield Ranch Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 07:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	**1**	0	**1**	0	0	0	0	0	**1**	0	**1**	0	0	0	0	**2**
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	1	0	1	0	0	0	0	0	1	0	1	0	0	0	0	2
% App. Total	0	100	0		0	0	0		0	100	0		0	0	0		
PHF	.000	.250	.000	.250	.000	.000	.000	.000	.000	.250	.000	.250	.000	.000	.000	.000	.250

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268
counts@countsunlimited.com

City of Chino Hills
N/S: Soquel Canyon Parkway
E/W: Butterfield Ranch Road
Weather: Clear

File Name : 09_CHH_Soquel Cyn_Butterfield_AM
Site Code : 05722517
Start Date : 5/24/2022
Page No : 2



Peak Hour Analysis From 07:00 AM to 07:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:00 AM				07:00 AM				07:00 AM				07:00 AM			
+0 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+30 mins.	0	**1**	0	**1**	0	0	0	0	0	**1**	0	**1**	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	1	0	1	0	0	0	0	0	1	0	1	0	0	0	0
% App. Total	0	100	0		0	0	0		0	100	0		0	0	0	
PHF	.000	.250	.000	.250	.000	.000	.000	.000	.000	.250	.000	.250	.000	.000	.000	.000

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268
counts@countsunlimited.com

City of Chino Hills
N/S: Soquel Canyon Parkway
E/W: Butterfield Ranch Road
Weather: Clear

File Name : 09_CHH_Soquel Cyn_Butterfield_AM
Site Code : 05722517
Start Date : 5/24/2022
Page No : 1

Groups Printed- 4+ Axle Trucks

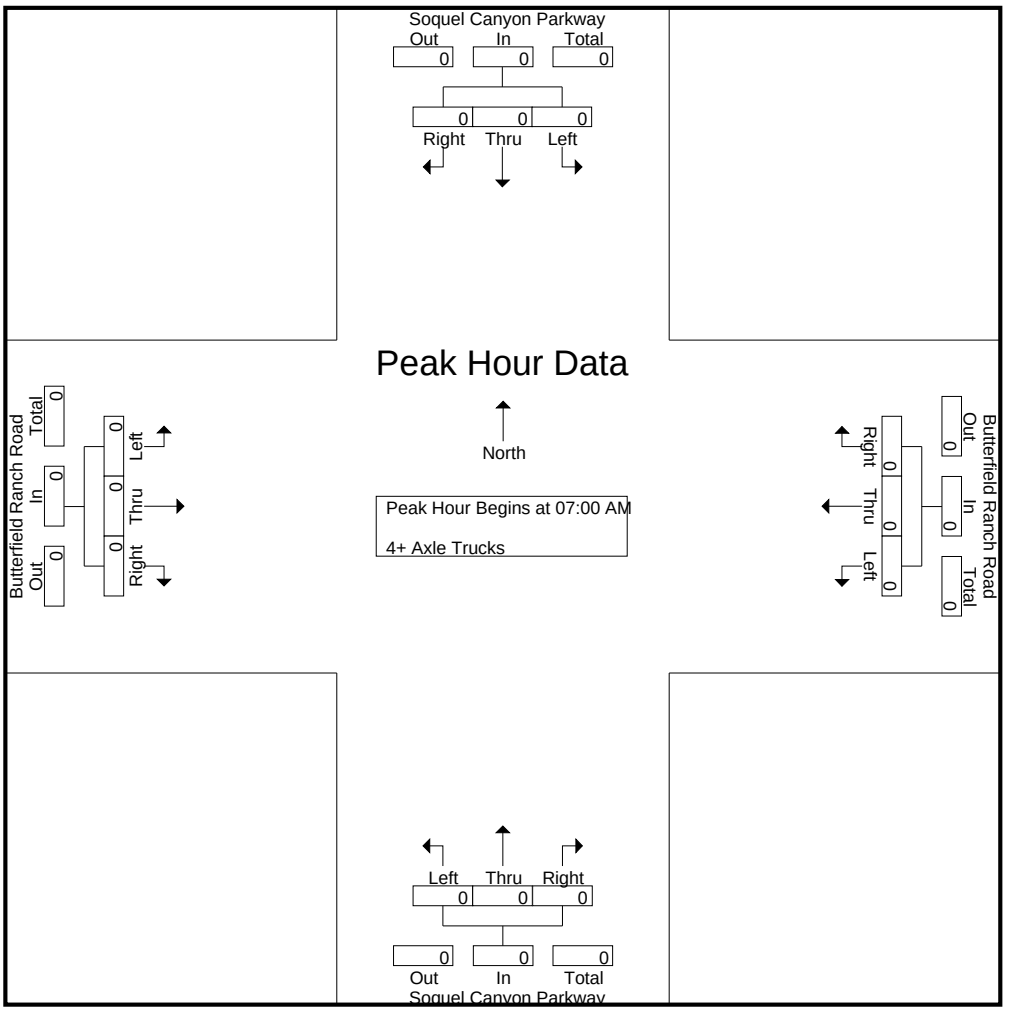
	Soquel Canyon Parkway Southbound				Butterfield Ranch Road Westbound				Soquel Canyon Parkway Northbound				Butterfield Ranch Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00 AM	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
Total	0	2	0	2	0	0	0	0	0	0	0	0	1	0	0	1	3
Grand Total	0	2	0	2	0	0	0	0	0	0	0	0	1	0	0	1	3
Apprch %	0	100	0		0	0	0		0	0	0		100	0	0		
Total %	0	66.7	0	66.7	0	0	0	0	0	0	0	0	33.3	0	0	33.3	

	Soquel Canyon Parkway Southbound				Butterfield Ranch Road Westbound				Soquel Canyon Parkway Northbound				Butterfield Ranch Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 07:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0		0	0	0		0	0	0		0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268
counts@countsunlimited.com

City of Chino Hills
N/S: Soquel Canyon Parkway
E/W: Butterfield Ranch Road
Weather: Clear

File Name : 09_CHH_Soquel Cyn_Butterfield_AM
Site Code : 05722517
Start Date : 5/24/2022
Page No : 2



Peak Hour Analysis From 07:00 AM to 07:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:00 AM				07:00 AM				07:00 AM				07:00 AM			
+0 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0		0	0	0		0	0	0		0	0	0	
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268
counts@countsunlimited.com

City of Chino Hills
N/S: Soquel Canyon Parkway
E/W: Butterfield Ranch Road
Weather: Clear

File Name : 09_CHH_Soquel Cyn_Butterfield_PM
Site Code : 05722517
Start Date : 5/24/2022
Page No : 1

Groups Printed- Passenger Vehicles - Large 2 Axle Vehicles - 3 Axle Vehicles - 4+ Axle Trucks

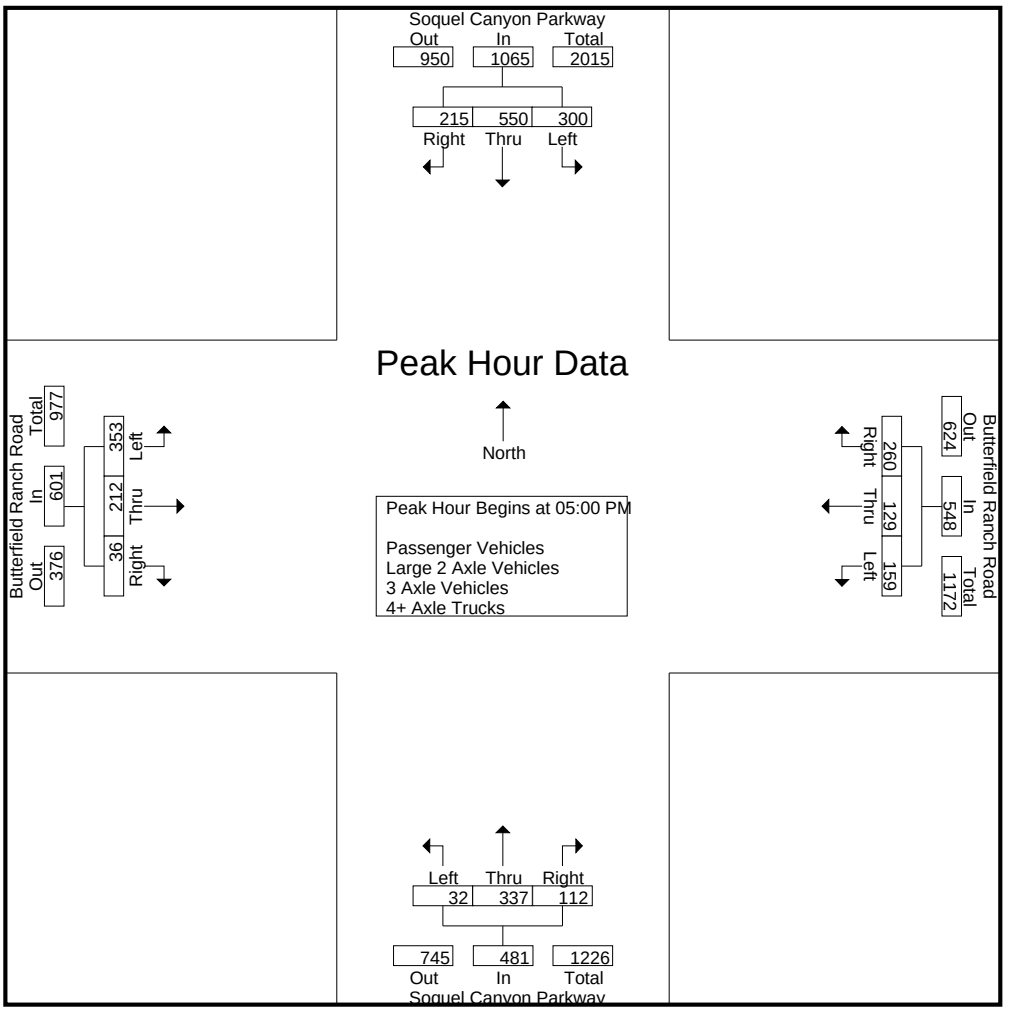
	Soquel Canyon Parkway Southbound				Butterfield Ranch Road Westbound				Soquel Canyon Parkway Northbound				Butterfield Ranch Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	89	142	47	278	26	28	46	100	6	84	23	113	59	46	5	110	601
04:15 PM	62	131	47	240	20	18	40	78	4	69	43	116	74	39	8	121	555
04:30 PM	52	119	46	217	30	20	50	100	6	46	19	71	72	52	11	135	523
04:45 PM	49	125	46	220	29	26	60	115	17	89	39	145	57	41	7	105	585
Total	252	517	186	955	105	92	196	393	33	288	124	445	262	178	31	471	2264
05:00 PM	86	139	60	285	39	38	74	151	7	95	49	151	100	52	8	160	747
05:15 PM	64	119	44	227	59	43	86	188	8	86	29	123	78	57	9	144	682
05:30 PM	85	148	46	279	34	28	58	120	7	87	13	107	95	57	8	160	666
05:45 PM	65	144	65	274	27	20	42	89	10	69	21	100	80	46	11	137	600
Total	300	550	215	1065	159	129	260	548	32	337	112	481	353	212	36	601	2695
Grand Total	552	1067	401	2020	264	221	456	941	65	625	236	926	615	390	67	1072	4959
Apprch %	27.3	52.8	19.9		28.1	23.5	48.5		7	67.5	25.5		57.4	36.4	6.2		
Total %	11.1	21.5	8.1	40.7	5.3	4.5	9.2	19	1.3	12.6	4.8	18.7	12.4	7.9	1.4	21.6	
Passenger Vehicles	551	1061	398	2010	263	221	451	935	65	620	236	921	606	390	67	1063	4929
% Passenger Vehicles	99.8	99.4	99.3	99.5	99.6	100	98.9	99.4	100	99.2	100	99.5	98.5	100	100	99.2	99.4
Large 2 Axle Vehicles	1	5	3	9	1	0	5	6	0	4	0	4	6	0	0	6	25
% Large 2 Axle Vehicles	0.2	0.5	0.7	0.4	0.4	0	1.1	0.6	0	0.6	0	0.4	1	0	0	0.6	0.5
3 Axle Vehicles	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1
% 3 Axle Vehicles	0	0	0	0	0	0	0	0	0	0.2	0	0.1	0	0	0	0	0
4+ Axle Trucks	0	1	0	1	0	0	0	0	0	0	0	0	3	0	0	3	4
% 4+ Axle Trucks	0	0.1	0	0	0	0	0	0	0	0	0	0	0.5	0	0	0.3	0.1

	Soquel Canyon Parkway Southbound				Butterfield Ranch Road Westbound				Soquel Canyon Parkway Northbound				Butterfield Ranch Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	**86**	139	60	**285**	39	38	74	151	7	**95**	**49**	**151**	**100**	52	8	**160**	**747**
05:15 PM	64	119	44	227	**59**	**43**	**86**	**188**	8	86	29	123	78	**57**	9	144	682
05:30 PM	85	**148**	46	279	34	28	58	120	7	87	13	107	95	57	8	160	666
05:45 PM	65	144	**65**	274	27	20	42	89	**10**	69	21	100	80	46	**11**	137	600
Total Volume	300	550	215	1065	159	129	260	548	32	337	112	481	353	212	36	601	2695
% App. Total	28.2	51.6	20.2		29	23.5	47.4		6.7	70.1	23.3		58.7	35.3	6		
PHF	.872	.929	.827	.934	.674	.750	.756	.729	.800	.887	.571	.796	.883	.930	.818	.939	.902

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268
counts@countsunlimited.com

City of Chino Hills
N/S: Soquel Canyon Parkway
E/W: Butterfield Ranch Road
Weather: Clear

File Name : 09_CHH_Soquel Cyn_Butterfield_PM
Site Code : 05722517
Start Date : 5/24/2022
Page No : 2



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	05:00 PM				04:45 PM				04:45 PM				05:00 PM			
+0 mins.	**86**	139	60	**285**	29	26	60	115	**17**	89	39	145	**100**	52	8	**160**
+15 mins.	64	119	44	227	39	38	74	151	7	**95**	**49**	**151**	78	**57**	9	144
+30 mins.	85	**148**	46	279	**59**	**43**	**86**	**188**	8	86	29	123	95	57	8	160
+45 mins.	65	144	**65**	274	34	28	58	120	7	87	13	107	80	46	**11**	137
Total Volume	300	550	215	1065	161	135	278	574	39	357	130	526	353	212	36	601
% App. Total	28.2	51.6	20.2		28	23.5	48.4		7.4	67.9	24.7		58.7	35.3	6	
PHF	.872	.929	.827	.934	.682	.785	.808	.763	.574	.939	.663	.871	.883	.930	.818	.939

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268
counts@countsunlimited.com

City of Chino Hills
N/S: Soquel Canyon Parkway
E/W: Butterfield Ranch Road
Weather: Clear

File Name : 09_CHH_Soquel Cyn_Butterfield_PM
Site Code : 05722517
Start Date : 5/24/2022
Page No : 1

Groups Printed- Passenger Vehicles

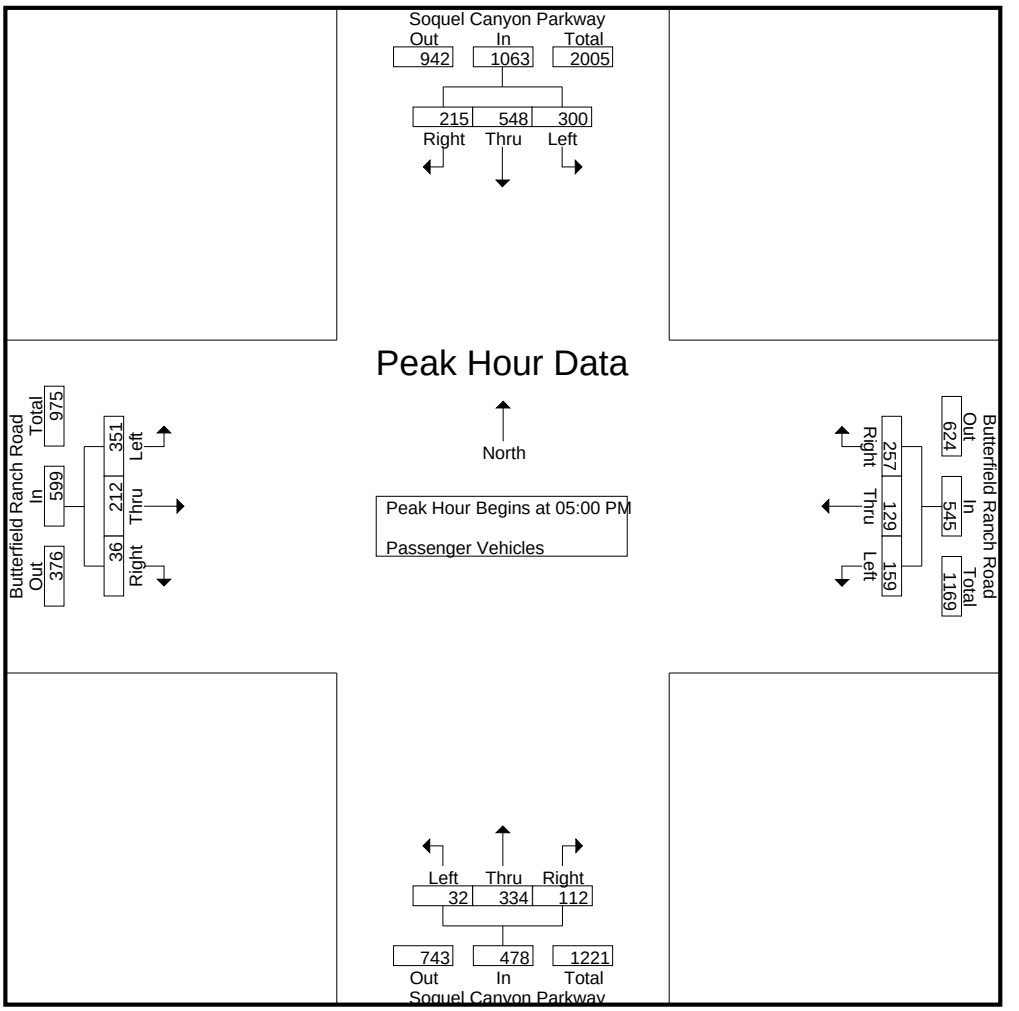
	Soquel Canyon Parkway Southbound				Butterfield Ranch Road Westbound				Soquel Canyon Parkway Northbound				Butterfield Ranch Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	88	141	45	274	26	28	45	99	6	83	23	112	55	46	5	106	591
04:15 PM	62	130	46	238	20	18	39	77	4	68	43	115	73	39	8	120	550
04:30 PM	52	118	46	216	29	20	50	99	6	46	19	71	70	52	11	133	519
04:45 PM	49	124	46	219	29	26	60	115	17	89	39	145	57	41	7	105	584
Total	251	513	183	947	104	92	194	390	33	286	124	443	255	178	31	464	2244
05:00 PM	86	139	60	285	39	38	74	151	7	92	49	148	100	52	8	160	744
05:15 PM	64	119	44	227	59	43	85	187	8	86	29	123	77	57	9	143	680
05:30 PM	85	147	46	278	34	28	58	120	7	87	13	107	94	57	8	159	664
05:45 PM	65	143	65	273	27	20	40	87	10	69	21	100	80	46	11	137	597
Total	300	548	215	1063	159	129	257	545	32	334	112	478	351	212	36	599	2685
Grand Total	551	1061	398	2010	263	221	451	935	65	620	236	921	606	390	67	1063	4929
Apprch %	27.4	52.8	19.8		28.1	23.6	48.2		7.1	67.3	25.6		57	36.7	6.3		
Total %	11.2	21.5	8.1	40.8	5.3	4.5	9.1	19	1.3	12.6	4.8	18.7	12.3	7.9	1.4	21.6	

	Soquel Canyon Parkway Southbound				Butterfield Ranch Road Westbound				Soquel Canyon Parkway Northbound				Butterfield Ranch Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 05:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	**86**	139	60	**285**	39	38	74	151	7	**92**	**49**	**148**	**100**	52	8	**160**	**744**
05:15 PM	64	119	44	227	**59**	**43**	**85**	**187**	8	86	29	123	77	**57**	9	143	680
05:30 PM	85	**147**	46	278	34	28	58	120	7	87	13	107	94	57	8	159	664
05:45 PM	65	143	**65**	273	27	20	40	87	**10**	69	21	100	80	46	**11**	137	597
Total Volume	300	548	215	1063	159	129	257	545	32	334	112	478	351	212	36	599	2685
% App. Total	28.2	51.6	20.2		29.2	23.7	47.2		6.7	69.9	23.4		58.6	35.4	6		
PHF	.872	.932	.827	.932	.674	.750	.756	.729	.800	.908	.571	.807	.878	.930	.818	.936	.902

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268
counts@countsunlimited.com

City of Chino Hills
N/S: Soquel Canyon Parkway
E/W: Butterfield Ranch Road
Weather: Clear

File Name : 09_CHH_Soquel Cyn_Butterfield_PM
Site Code : 05722517
Start Date : 5/24/2022



Peak Hour Analysis From 05:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	05:00 PM				05:00 PM				05:00 PM				05:00 PM			
+0 mins.	**86**	139	60	**285**	39	38	74	151	7	**92**	**49**	**148**	**100**	52	8	**160**
+15 mins.	64	119	44	227	**59**	**43**	**85**	**187**	8	86	29	123	77	**57**	9	143
+30 mins.	85	**147**	46	278	34	28	58	120	7	87	13	107	94	57	8	159
+45 mins.	65	143	**65**	273	27	20	40	87	**10**	69	21	100	80	46	**11**	137
Total Volume	300	548	215	1063	159	129	257	545	32	334	112	478	351	212	36	599
% App. Total	28.2	51.6	20.2		29.2	23.7	47.2		6.7	69.9	23.4		58.6	35.4	6	
PHF	.872	.932	.827	.932	.674	.750	.756	.729	.800	.908	.571	.807	.878	.930	.818	.936

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268
counts@countsunlimited.com

City of Chino Hills
N/S: Soquel Canyon Parkway
E/W: Butterfield Ranch Road
Weather: Clear

File Name : 09_CHH_Soquel Cyn_Butterfield_PM
Site Code : 05722517
Start Date : 5/24/2022
Page No : 1

Groups Printed- Large 2 Axle Vehicles

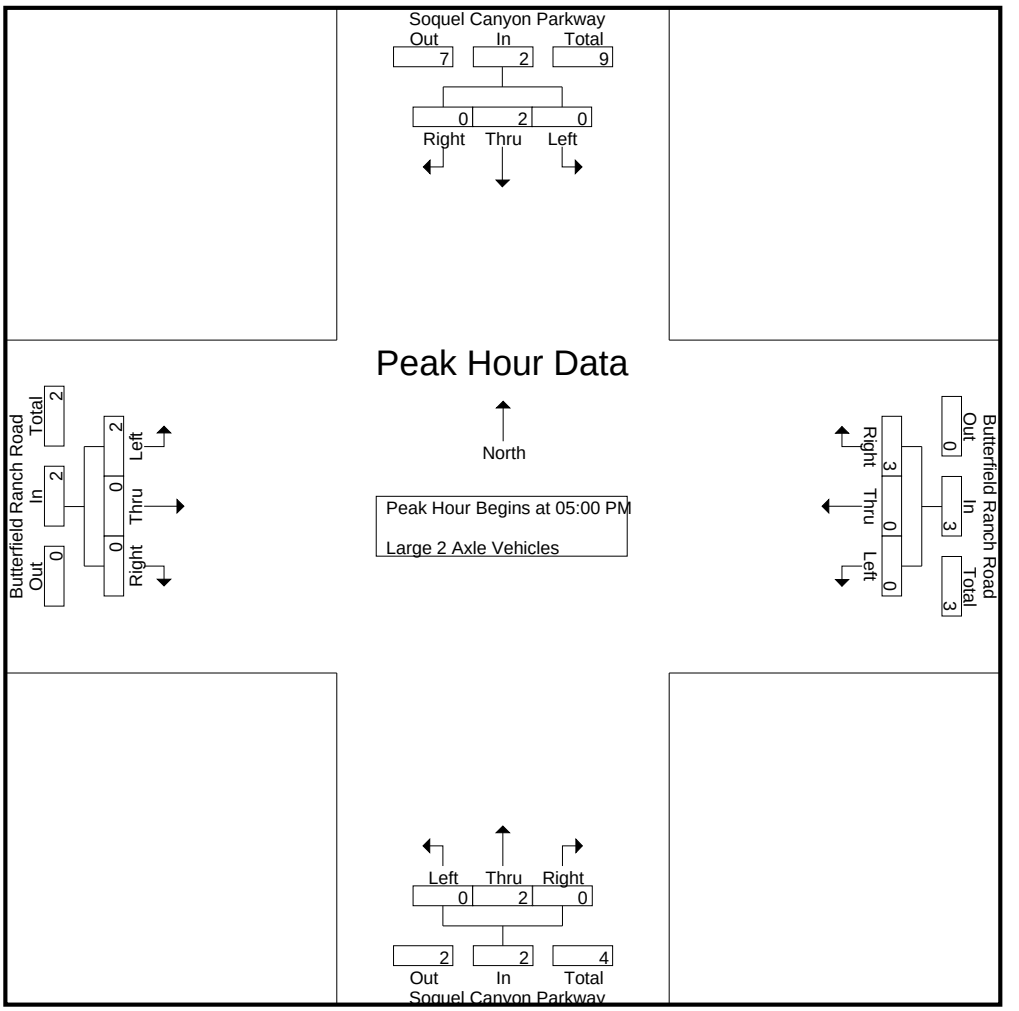
	Soquel Canyon Parkway Southbound				Butterfield Ranch Road Westbound				Soquel Canyon Parkway Northbound				Butterfield Ranch Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	1	1	2	4	0	0	1	1	0	1	0	1	2	0	0	2	8
04:15 PM	0	1	1	2	0	0	1	1	0	1	0	1	1	0	0	1	5
04:30 PM	0	0	0	0	1	0	0	1	0	0	0	0	1	0	0	1	2
04:45 PM	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Total	1	3	3	7	1	0	2	3	0	2	0	2	4	0	0	4	16
05:00 PM	0	0	0	0	0	0	0	0	0	2	0	2	0	0	0	0	2
05:15 PM	0	0	0	0	0	0	1	1	0	0	0	0	1	0	0	1	2
05:30 PM	0	1	0	1	0	0	0	0	0	0	0	0	1	0	0	1	2
05:45 PM	0	1	0	1	0	0	2	2	0	0	0	0	0	0	0	0	3
Total	0	2	0	2	0	0	3	3	0	2	0	2	2	0	0	2	9
Grand Total	1	5	3	9	1	0	5	6	0	4	0	4	6	0	0	6	25
Apprch %	11.1	55.6	33.3		16.7	0	83.3		0	100	0		100	0	0		
Total %	4	20	12	36	4	0	20	24	0	16	0	16	24	0	0	24	

	Soquel Canyon Parkway Southbound				Butterfield Ranch Road Westbound				Soquel Canyon Parkway Northbound				Butterfield Ranch Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 05:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	0	0	0	0	0	0	0	0	0	**2**	0	**2**	0	0	0	0	2
05:15 PM	0	0	0	0	0	0	1	1	0	0	0	0	**1**	0	0	**1**	2
05:30 PM	0	**1**	0	**1**	0	0	0	0	0	0	0	0	1	0	0	1	2
05:45 PM	0	1	0	1	0	0	**2**	**2**	0	0	0	0	0	0	0	0	**3**
Total Volume	0	2	0	2	0	0	3	3	0	2	0	2	2	0	0	2	9
% App. Total	0	100	0		0	0	100		0	100	0		100	0	0		
PHF	.000	.500	.000	.500	.000	.000	.375	.375	.000	.250	.000	.250	.500	.000	.000	.500	.750

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268
counts@countsunlimited.com

City of Chino Hills
N/S: Soquel Canyon Parkway
E/W: Butterfield Ranch Road
Weather: Clear

File Name : 09_CHH_Soquel Cyn_Butterfield_PM
Site Code : 05722517
Start Date : 5/24/2022
Page No : 2



Peak Hour Analysis From 05:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	05:00 PM				05:00 PM				05:00 PM				05:00 PM			
+0 mins.	0	0	0	0	0	0	0	0	0	**2**	0	**2**	0	0	0	0
+15 mins.	0	0	0	0	0	0	1	1	0	0	0	0	**1**	0	0	**1**
+30 mins.	0	**1**	0	**1**	0	0	0	0	0	0	0	0	1	0	0	1
+45 mins.	0	1	0	1	0	0	**2**	**2**	0	0	0	0	0	0	0	0
Total Volume	0	2	0	2	0	0	3	3	0	2	0	2	2	0	0	2
% App. Total	0	100	0		0	0	100		0	100	0		100	0	0	
PHF	.000	.500	.000	.500	.000	.000	.375	.375	.000	.250	.000	.250	.500	.000	.000	.500

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268
counts@countsunlimited.com

City of Chino Hills
N/S: Soquel Canyon Parkway
E/W: Butterfield Ranch Road
Weather: Clear

File Name : 09_CHH_Soquel Cyn_Butterfield_PM
Site Code : 05722517
Start Date : 5/24/2022
Page No : 1

Groups Printed- 3 Axle Vehicles

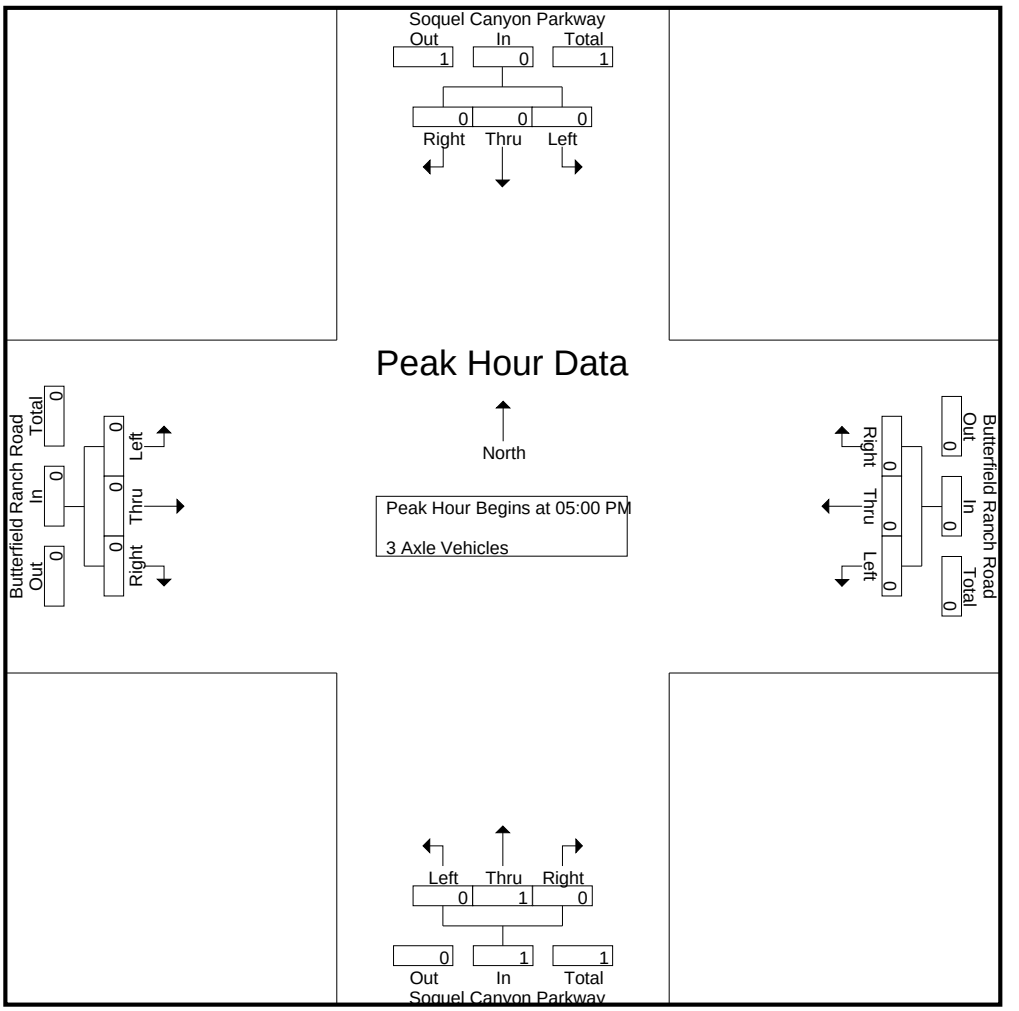
	Soquel Canyon Parkway Southbound				Butterfield Ranch Road Westbound				Soquel Canyon Parkway Northbound				Butterfield Ranch Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1
Grand Total	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1
Apprch %	0	0	0		0	0	0		0	100	0		0	0	0		
Total %	0	0	0	0	0	0	0	0	0	100	0	100	0	0	0	0	

	Soquel Canyon Parkway Southbound				Butterfield Ranch Road Westbound				Soquel Canyon Parkway Northbound				Butterfield Ranch Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 05:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	0	0	0	0	0	0	0	0	0	**1**	0	**1**	0	0	0	0	**1**
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1
% App. Total	0	0	0		0	0	0		0	100	0		0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.250	.000	.250	.000	.000	.000	.000	.250

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268
counts@countsunlimited.com

City of Chino Hills
N/S: Soquel Canyon Parkway
E/W: Butterfield Ranch Road
Weather: Clear

File Name : 09_CHH_Soquel Cyn_Butterfield_PM
Site Code : 05722517
Start Date : 5/24/2022
Page No : 2



Peak Hour Analysis From 05:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	05:00 PM				05:00 PM				05:00 PM				05:00 PM			
+0 mins.	0	0	0	0	0	0	0	0	0	**1**	0	**1**	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0
% App. Total	0	0	0		0	0	0		0	100	0		0	0	0	
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.250	.000	.250	.000	.000	.000	.000

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268
counts@countsunlimited.com

City of Chino Hills
N/S: Soquel Canyon Parkway
E/W: Butterfield Ranch Road
Weather: Clear

File Name : 09_CHH_Soquel Cyn_Butterfield_PM
Site Code : 05722517
Start Date : 5/24/2022
Page No : 1

Groups Printed- 4+ Axle Trucks

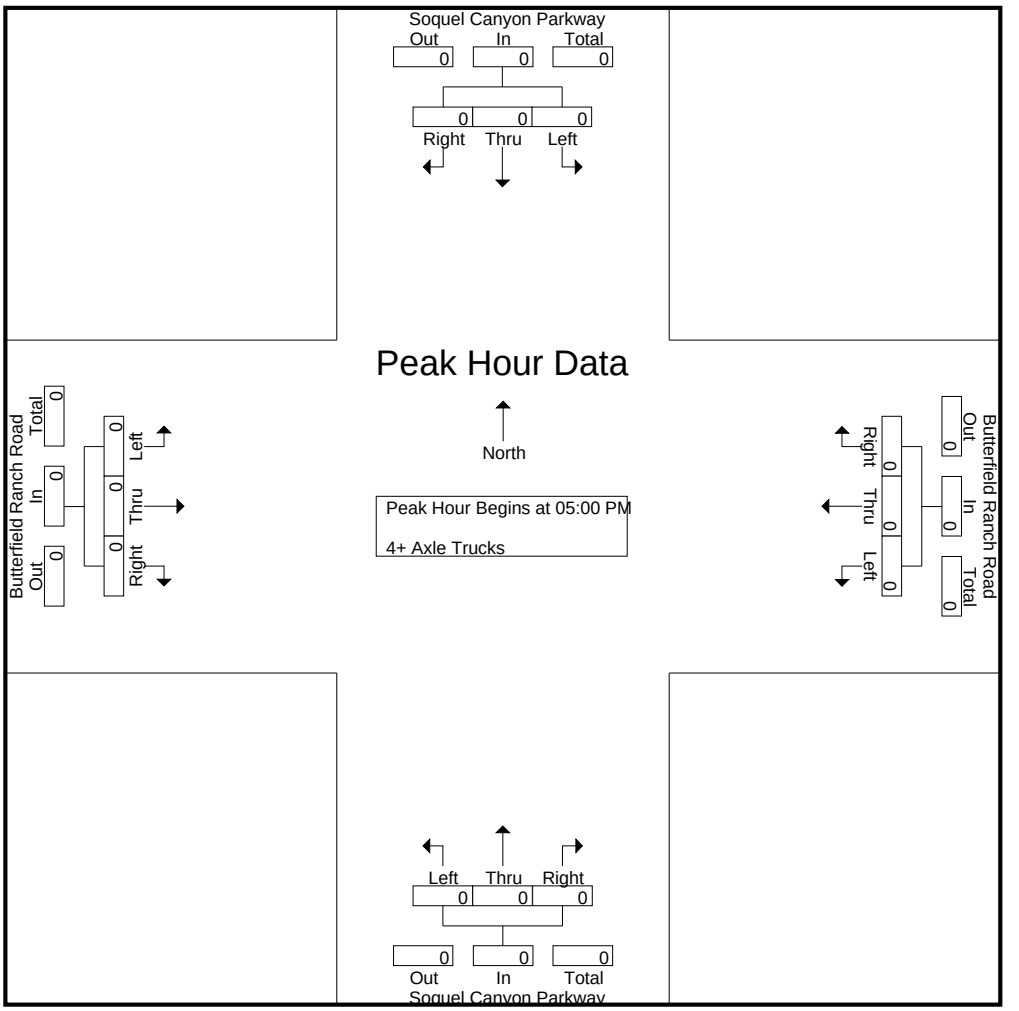
	Soquel Canyon Parkway Southbound				Butterfield Ranch Road Westbound				Soquel Canyon Parkway Northbound				Butterfield Ranch Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	2
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	1	0	1	0	0	0	0	0	0	0	0	1	0	0	1	2
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	1	0	1	0	0	0	0	0	0	0	0	3	0	0	3	4
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	1	0	1	0	0	0	0	0	0	0	0	3	0	0	3	4
Apprch %	0	100	0		0	0	0		0	0	0		100	0	0		
Total %	0	25	0	25	0	0	0	0	0	0	0	0	75	0	0	75	

	Soquel Canyon Parkway Southbound				Butterfield Ranch Road Westbound				Soquel Canyon Parkway Northbound				Butterfield Ranch Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 05:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0		0	0	0		0	0	0		0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268
counts@countsunlimited.com

City of Chino Hills
N/S: Soquel Canyon Parkway
E/W: Butterfield Ranch Road
Weather: Clear

File Name : 09_CHH_Soquel Cyn_Butterfield_PM
Site Code : 05722517
Start Date : 5/24/2022
Page No : 2



Peak Hour Analysis From 05:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	05:00 PM				05:00 PM				05:00 PM				05:00 PM			
+0 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0		0	0	0		0	0	0		0	0	0	
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268
counts@countsunlimited.com

City of Chino Hills
N/S: Soquel Canyon Parkway
E/W: Pomona Rincon Road
Weather: Clear

File Name : 10_CHH_Soquel Cyn_Pom Rincon_AM
Site Code : 05722517
Start Date : 5/24/2022
Page No : 1

Groups Printed- Passenger Vehicles - Large 2 Axle Vehicles - 3 Axle Vehicles - 4+ Axle Trucks

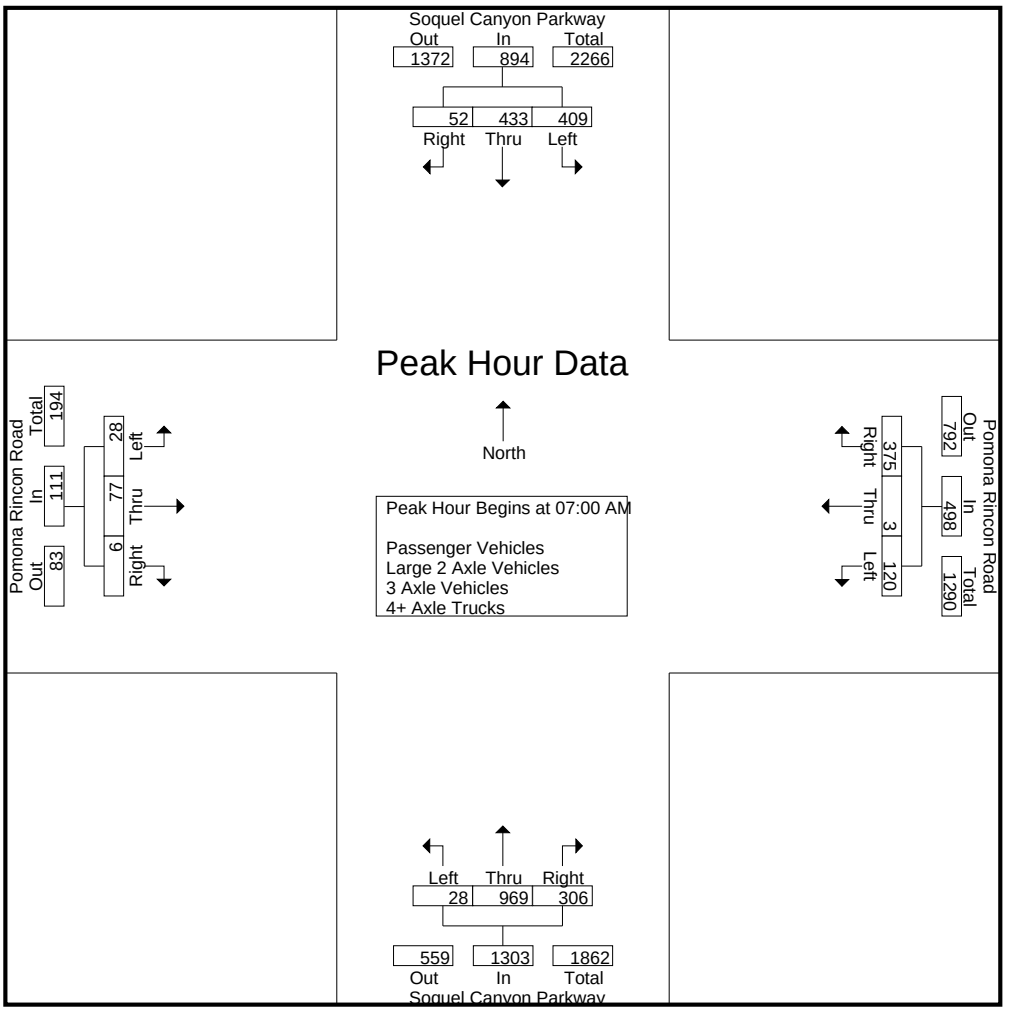
	Soquel Canyon Parkway Southbound				Pomona Rincon Road Westbound				Soquel Canyon Parkway Northbound				Pomona Rincon Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	231	104	46	381	38	0	148	186	7	259	180	446	3	63	2	68	1081
07:15 AM	57	81	1	139	44	3	116	163	4	281	95	380	6	9	1	16	698
07:30 AM	61	98	3	162	19	0	56	75	6	196	17	219	12	4	2	18	474
07:45 AM	60	150	2	212	19	0	55	74	11	233	14	258	7	1	1	9	553
Total	409	433	52	894	120	3	375	498	28	969	306	1303	28	77	6	111	2806
08:00 AM	57	135	6	198	19	2	55	76	8	218	13	239	14	3	2	19	532
08:15 AM	83	114	15	212	12	1	46	59	6	261	16	283	6	4	1	11	565
08:30 AM	55	116	3	174	9	1	56	66	6	234	16	256	16	2	1	19	515
08:45 AM	59	98	5	162	16	1	42	59	4	194	13	211	10	0	1	11	443
Total	254	463	29	746	56	5	199	260	24	907	58	989	46	9	5	60	2055
Grand Total	663	896	81	1640	176	8	574	758	52	1876	364	2292	74	86	11	171	4861
Apprch %	40.4	54.6	4.9		23.2	1.1	75.7		2.3	81.8	15.9		43.3	50.3	6.4		
Total %	13.6	18.4	1.7	33.7	3.6	0.2	11.8	15.6	1.1	38.6	7.5	47.2	1.5	1.8	0.2	3.5	
Passenger Vehicles	652	882	81	1615	176	8	567	751	51	1853	362	2266	73	86	11	170	4802
% Passenger Vehicles	98.3	98.4	100	98.5	100	100	98.8	99.1	98.1	98.8	99.5	98.9	98.6	100	100	99.4	98.8
Large 2 Axle Vehicles	11	13	0	24	0	0	7	7	1	20	2	23	1	0	0	1	55
% Large 2 Axle Vehicles	1.7	1.5	0	1.5	0	0	1.2	0.9	1.9	1.1	0.5	1	1.4	0	0	0.6	1.1
3 Axle Vehicles	0	1	0	1	0	0	0	0	0	1	0	1	0	0	0	0	2
% 3 Axle Vehicles	0	0.1	0	0.1	0	0	0	0	0	0.1	0	0	0	0	0	0	0
4+ Axle Trucks	0	0	0	0	0	0	0	0	0	2	0	2	0	0	0	0	2
% 4+ Axle Trucks	0	0	0	0	0	0	0	0	0	0.1	0	0.1	0	0	0	0	0

	Soquel Canyon Parkway Southbound				Pomona Rincon Road Westbound				Soquel Canyon Parkway Northbound				Pomona Rincon Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	**231**	104	**46**	**381**	38	0	**148**	**186**	7	259	**180**	**446**	3	**63**	**2**	**68**	**1081**
07:15 AM	57	81	1	139	**44**	**3**	116	163	4	**281**	95	380	6	9	1	16	698
07:30 AM	61	98	3	162	19	0	56	75	6	196	17	219	**12**	4	2	18	474
07:45 AM	60	**150**	2	212	19	0	55	74	**11**	233	14	258	7	1	1	9	553
Total Volume	409	433	52	894	120	3	375	498	28	969	306	1303	28	77	6	111	2806
% App. Total	45.7	48.4	5.8		24.1	0.6	75.3		2.1	74.4	23.5		25.2	69.4	5.4		
PHF	.443	.722	.283	.587	.682	.250	.633	.669	.636	.862	.425	.730	.583	.306	.750	.408	.649

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268
counts@countsunlimited.com

City of Chino Hills
N/S: Soquel Canyon Parkway
E/W: Pomona Rincon Road
Weather: Clear

File Name : 10_CHH_Soquel Cyn_Pom Rincon_AM
Site Code : 05722517
Start Date : 5/24/2022



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:00 AM				07:00 AM				07:00 AM				07:00 AM			
+0 mins.	**231**	104	**46**	**381**	38	0	**148**	**186**	7	259	**180**	**446**	3	**63**	**2**	**68**
+15 mins.	57	81	1	139	**44**	**3**	116	163	4	**281**	95	380	6	9	1	16
+30 mins.	61	98	3	162	19	0	56	75	6	196	17	219	**12**	4	2	18
+45 mins.	60	**150**	2	212	19	0	55	74	**11**	233	14	258	7	1	1	9
Total Volume	409	433	52	894	120	3	375	498	28	969	306	1303	28	77	6	111
% App. Total	45.7	48.4	5.8		24.1	0.6	75.3		2.1	74.4	23.5		25.2	69.4	5.4	
PHF	.443	.722	.283	.587	.682	.250	.633	.669	.636	.862	.425	.730	.583	.306	.750	.408

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268
counts@countsunlimited.com

City of Chino Hills
N/S: Soquel Canyon Parkway
E/W: Pomona Rincon Road
Weather: Clear

File Name : 10_CHH_Soquel Cyn_Pom Rincon_AM
Site Code : 05722517
Start Date : 5/24/2022
Page No : 1

Groups Printed- Passenger Vehicles

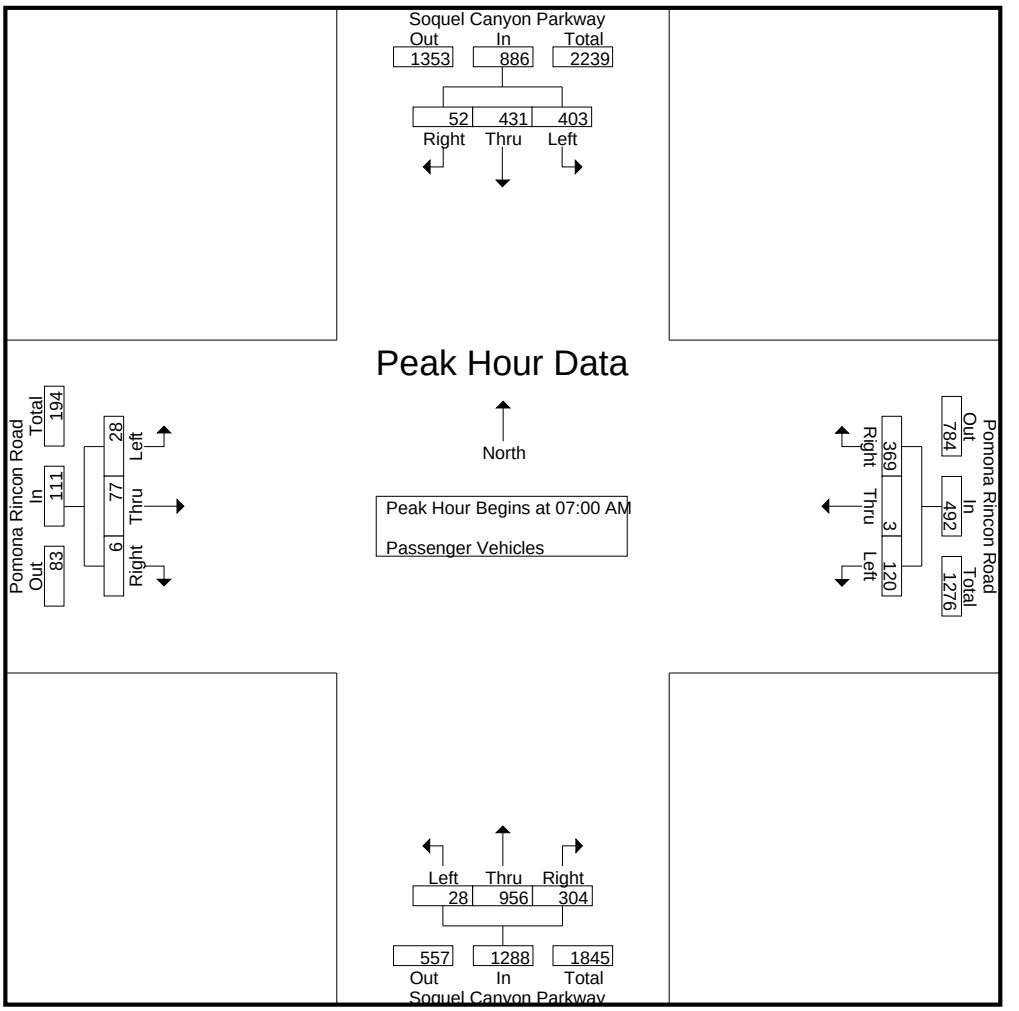
	Soquel Canyon Parkway Southbound				Pomona Rincon Road Westbound				Soquel Canyon Parkway Northbound				Pomona Rincon Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	229	103	46	378	38	0	148	186	7	255	179	441	3	63	2	68	1073
07:15 AM	56	81	1	138	44	3	113	160	4	277	94	375	6	9	1	16	689
07:30 AM	59	98	3	160	19	0	54	73	6	194	17	217	12	4	2	18	468
07:45 AM	59	149	2	210	19	0	54	73	11	230	14	255	7	1	1	9	547
Total	403	431	52	886	120	3	369	492	28	956	304	1288	28	77	6	111	2777
08:00 AM	55	132	6	193	19	2	55	76	8	216	13	237	14	3	2	19	525
08:15 AM	82	112	15	209	12	1	45	58	5	257	16	278	6	4	1	11	556
08:30 AM	55	114	3	172	9	1	56	66	6	232	16	254	15	2	1	18	510
08:45 AM	57	93	5	155	16	1	42	59	4	192	13	209	10	0	1	11	434
Total	249	451	29	729	56	5	198	259	23	897	58	978	45	9	5	59	2025
Grand Total	652	882	81	1615	176	8	567	751	51	1853	362	2266	73	86	11	170	4802
Apprch %	40.4	54.6	5		23.4	1.1	75.5		2.3	81.8	16		42.9	50.6	6.5		
Total %	13.6	18.4	1.7	33.6	3.7	0.2	11.8	15.6	1.1	38.6	7.5	47.2	1.5	1.8	0.2	3.5	

	Soquel Canyon Parkway Southbound				Pomona Rincon Road Westbound				Soquel Canyon Parkway Northbound				Pomona Rincon Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 07:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	**229**	103	**46**	**378**	38	0	**148**	**186**	7	255	**179**	**441**	3	**63**	**2**	**68**	**1073**
07:15 AM	56	81	1	138	**44**	**3**	113	160	4	**277**	94	375	6	9	1	16	689
07:30 AM	59	98	3	160	19	0	54	73	6	194	17	217	**12**	4	2	18	468
07:45 AM	59	**149**	2	210	19	0	54	73	**11**	230	14	255	7	1	1	9	547
Total Volume	403	431	52	886	120	3	369	492	28	956	304	1288	28	77	6	111	2777
% App. Total	45.5	48.6	5.9		24.4	0.6	75		2.2	74.2	23.6		25.2	69.4	5.4		
PHF	.440	.723	.283	.586	.682	.250	.623	.661	.636	.863	.425	.730	.583	.306	.750	.408	.647

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268
counts@countsunlimited.com

City of Chino Hills
N/S: Soquel Canyon Parkway
E/W: Pomona Rincon Road
Weather: Clear

File Name : 10_CHH_Soquel Cyn_Pom Rincon_AM
Site Code : 05722517
Start Date : 5/24/2022



Peak Hour Analysis From 07:00 AM to 07:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:00 AM				07:00 AM				07:00 AM				07:00 AM			
+0 mins.	**229**	103	**46**	**378**	38	0	**148**	**186**	7	255	**179**	**441**	3	**63**	**2**	**68**
+15 mins.	56	81	1	138	**44**	**3**	113	160	4	**277**	94	375	6	9	1	16
+30 mins.	59	98	3	160	19	0	54	73	6	194	17	217	**12**	4	2	18
+45 mins.	59	**149**	2	210	19	0	54	73	**11**	230	14	255	7	1	1	9
Total Volume	403	431	52	886	120	3	369	492	28	956	304	1288	28	77	6	111
% App. Total	45.5	48.6	5.9		24.4	0.6	75		2.2	74.2	23.6		25.2	69.4	5.4	
PHF	.440	.723	.283	.586	.682	.250	.623	.661	.636	.863	.425	.730	.583	.306	.750	.408

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268
counts@countsunlimited.com

City of Chino Hills
N/S: Soquel Canyon Parkway
E/W: Pomona Rincon Road
Weather: Clear

File Name : 10_CHH_Soquel Cyn_Pom Rincon_AM
Site Code : 05722517
Start Date : 5/24/2022
Page No : 1

Groups Printed- Large 2 Axle Vehicles

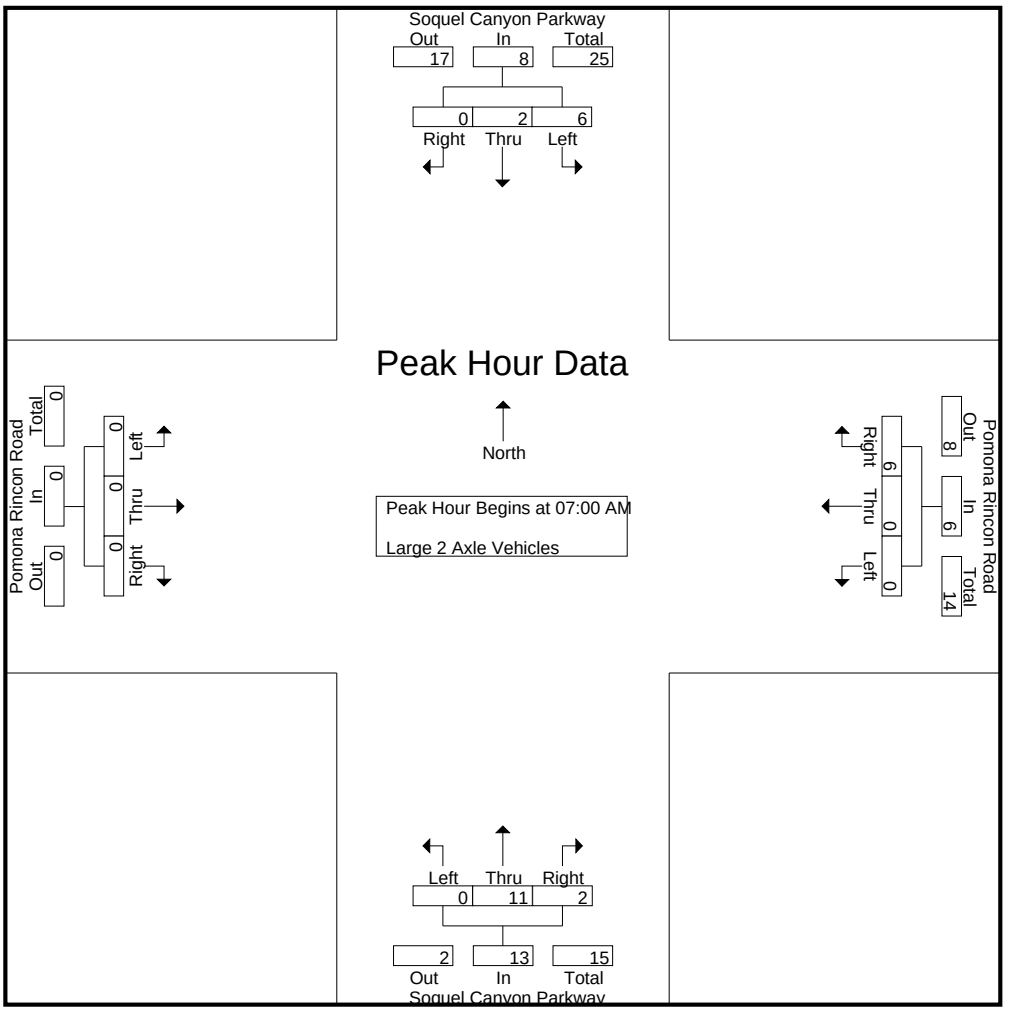
	Soquel Canyon Parkway Southbound				Pomona Rincon Road Westbound				Soquel Canyon Parkway Northbound				Pomona Rincon Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	2	1	0	3	0	0	0	0	0	4	1	5	0	0	0	0	8
07:15 AM	1	0	0	1	0	0	3	3	0	3	1	4	0	0	0	0	8
07:30 AM	2	0	0	2	0	0	2	2	0	1	0	1	0	0	0	0	5
07:45 AM	1	1	0	2	0	0	1	1	0	3	0	3	0	0	0	0	6
Total	6	2	0	8	0	0	6	6	0	11	2	13	0	0	0	0	27
08:00 AM	2	2	0	4	0	0	0	0	0	2	0	2	0	0	0	0	6
08:15 AM	1	2	0	3	0	0	1	1	1	4	0	5	0	0	0	0	9
08:30 AM	0	2	0	2	0	0	0	0	0	2	0	2	1	0	0	1	5
08:45 AM	2	5	0	7	0	0	0	0	0	1	0	1	0	0	0	0	8
Total	5	11	0	16	0	0	1	1	1	9	0	10	1	0	0	1	28
Grand Total	11	13	0	24	0	0	7	7	1	20	2	23	1	0	0	1	55
Apprch %	45.8	54.2	0		0	0	100		4.3	87	8.7		100	0	0		
Total %	20	23.6	0	43.6	0	0	12.7	12.7	1.8	36.4	3.6	41.8	1.8	0	0	1.8	

	Soquel Canyon Parkway Southbound				Pomona Rincon Road Westbound				Soquel Canyon Parkway Northbound				Pomona Rincon Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 07:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	**2**	**1**	0	**3**	0	0	0	0	0	**4**	**1**	**5**	0	0	0	0	**8**
07:15 AM	1	0	0	1	0	0	**3**	**3**	0	3	1	4	0	0	0	0	8
07:30 AM	2	0	0	2	0	0	2	2	0	1	0	1	0	0	0	0	5
07:45 AM	1	1	0	2	0	0	1	1	0	3	0	3	0	0	0	0	6
Total Volume	6	2	0	8	0	0	6	6	0	11	2	13	0	0	0	0	27
% App. Total	75	25	0		0	0	100		0	84.6	15.4		0	0	0		
PHF	.750	.500	.000	.667	.000	.000	.500	.500	.000	.688	.500	.650	.000	.000	.000	.000	.844

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268
counts@countsunlimited.com

City of Chino Hills
N/S: Soquel Canyon Parkway
E/W: Pomona Rincon Road
Weather: Clear

File Name : 10_CHH_Soquel Cyn_Pom Rincon_AM
Site Code : 05722517
Start Date : 5/24/2022



Peak Hour Analysis From 07:00 AM to 07:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:00 AM				07:00 AM				07:00 AM				07:00 AM			
+0 mins.	**2**	**1**	0	**3**	0	0	0	0	0	**4**	**1**	**5**	0	0	0	0
+15 mins.	1	0	0	1	0	0	**3**	**3**	0	3	1	4	0	0	0	0
+30 mins.	2	0	0	2	0	0	2	2	0	1	0	1	0	0	0	0
+45 mins.	1	1	0	2	0	0	1	1	0	3	0	3	0	0	0	0
Total Volume	6	2	0	8	0	0	6	6	0	11	2	13	0	0	0	0
% App. Total	75	25	0		0	0	100		0	84.6	15.4		0	0	0	
PHF	.750	.500	.000	.667	.000	.000	.500	.500	.000	.688	.500	.650	.000	.000	.000	.000

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268
counts@countsunlimited.com

City of Chino Hills
N/S: Soquel Canyon Parkway
E/W: Pomona Rincon Road
Weather: Clear

File Name : 10_CHH_Soquel Cyn_Pom Rincon_AM
Site Code : 05722517
Start Date : 5/24/2022
Page No : 1

Groups Printed- 3 Axle Vehicles

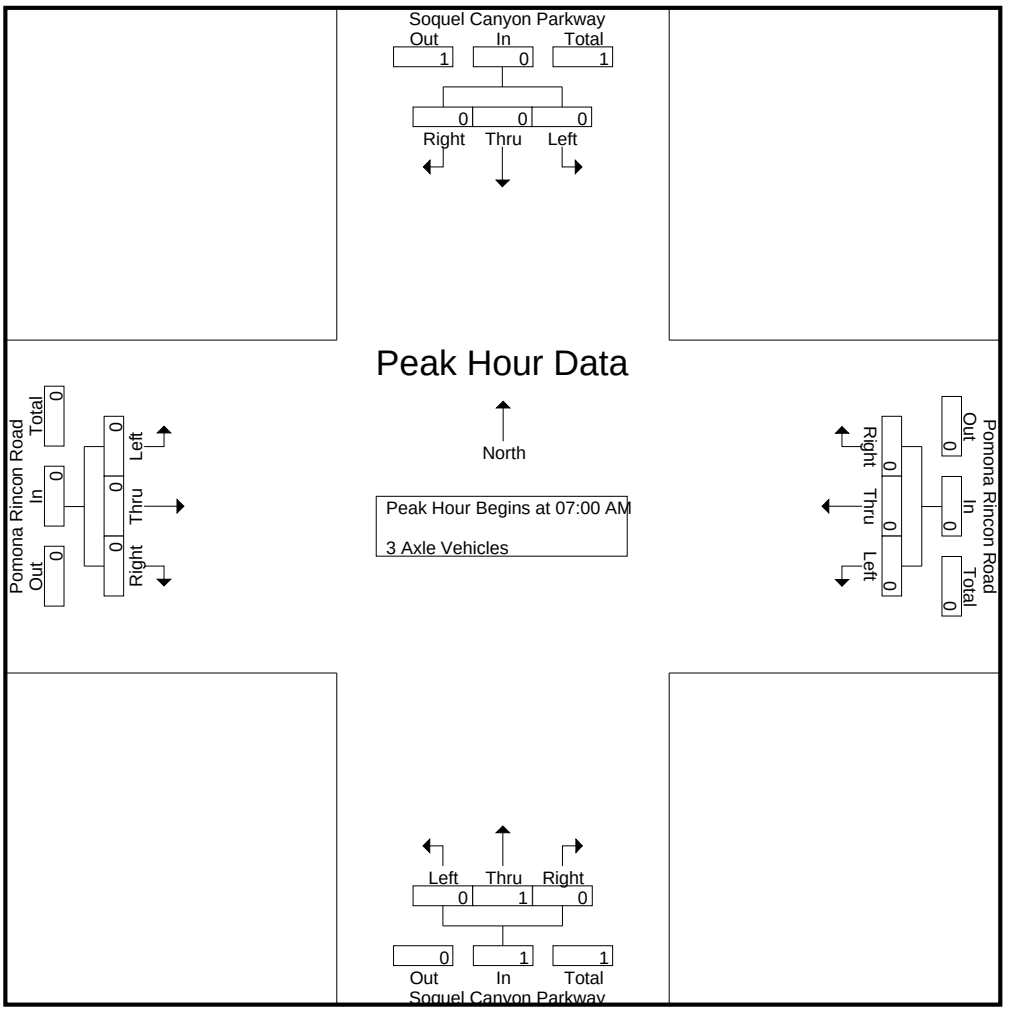
	Soquel Canyon Parkway Southbound				Pomona Rincon Road Westbound				Soquel Canyon Parkway Northbound				Pomona Rincon Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1
08:00 AM	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Grand Total	0	1	0	1	0	0	0	0	0	1	0	1	0	0	0	0	2
Apprch %	0	100	0		0	0	0		0	100	0		0	0	0		
Total %	0	50	0	50	0	0	0	0	0	50	0	50	0	0	0	0	

	Soquel Canyon Parkway Southbound				Pomona Rincon Road Westbound				Soquel Canyon Parkway Northbound				Pomona Rincon Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 07:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	**1**	0	**1**	0	0	0	0	**1**
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1
% App. Total	0	0	0		0	0	0		0	100	0		0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.250	.000	.250	.000	.000	.000	.000	.250

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268
counts@countsunlimited.com

City of Chino Hills
N/S: Soquel Canyon Parkway
E/W: Pomona Rincon Road
Weather: Clear

File Name : 10_CHH_Soquel Cyn_Pom Rincon_AM
Site Code : 05722517
Start Date : 5/24/2022



Peak Hour Analysis From 07:00 AM to 07:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:00 AM				07:00 AM				07:00 AM				07:00 AM			
+0 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0	**1**	0	**1**	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0
% App. Total	0	0	0		0	0	0		0	100	0		0	0	0	
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.250	.000	.250	.000	.000	.000	.000

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268
counts@countsunlimited.com

City of Chino Hills
N/S: Soquel Canyon Parkway
E/W: Pomona Rincon Road
Weather: Clear

File Name : 10_CHH_Soquel Cyn_Pom Rincon_AM
Site Code : 05722517
Start Date : 5/24/2022

Groups Printed- 4+ Axle Trucks

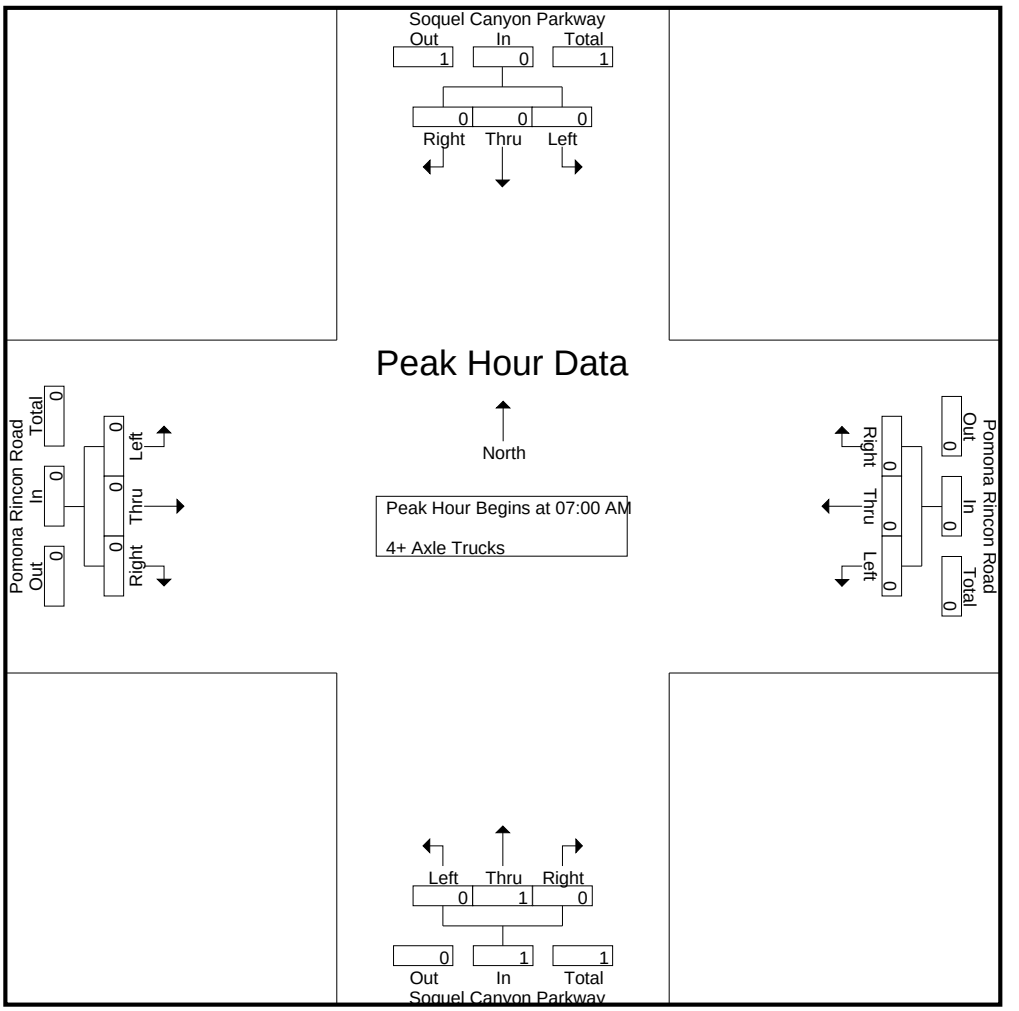
	Soquel Canyon Parkway Southbound				Pomona Rincon Road Westbound				Soquel Canyon Parkway Northbound				Pomona Rincon Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1
Total	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1
Grand Total	0	0	0	0	0	0	0	0	0	2	0	2	0	0	0	0	2
Apprch %	0	0	0		0	0	0		0	100	0		0	0	0		
Total %	0	0	0	0	0	0	0	0	0	100	0	100	0	0	0	0	

	Soquel Canyon Parkway Southbound				Pomona Rincon Road Westbound				Soquel Canyon Parkway Northbound				Pomona Rincon Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 07:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	**1**	0	**1**	0	0	0	0	**1**
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1
% App. Total	0	0	0		0	0	0		0	100	0		0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.250	.000	.250	.000	.000	.000	.000	.250

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268
counts@countsunlimited.com

City of Chino Hills
N/S: Soquel Canyon Parkway
E/W: Pomona Rincon Road
Weather: Clear

File Name : 10_CHH_Soquel Cyn_Pom Rincon_AM
Site Code : 05722517
Start Date : 5/24/2022



Peak Hour Analysis From 07:00 AM to 07:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:00 AM				07:00 AM				07:00 AM				07:00 AM			
+0 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0	**1**	0	**1**	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0
% App. Total	0	0	0		0	0	0		0	100	0		0	0	0	
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.250	.000	.250	.000	.000	.000	.000

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268
counts@countsunlimited.com

City of Chino Hills
N/S: Soquel Canyon Parkway
E/W: Pomona Rincon Road
Weather: Clear

File Name : 10_CHH_Soquel Cyn_Pom Rincon_PM
Site Code : 05722517
Start Date : 5/24/2022
Page No : 1

Groups Printed- Passenger Vehicles - Large 2 Axle Vehicles - 3 Axle Vehicles - 4+ Axle Trucks

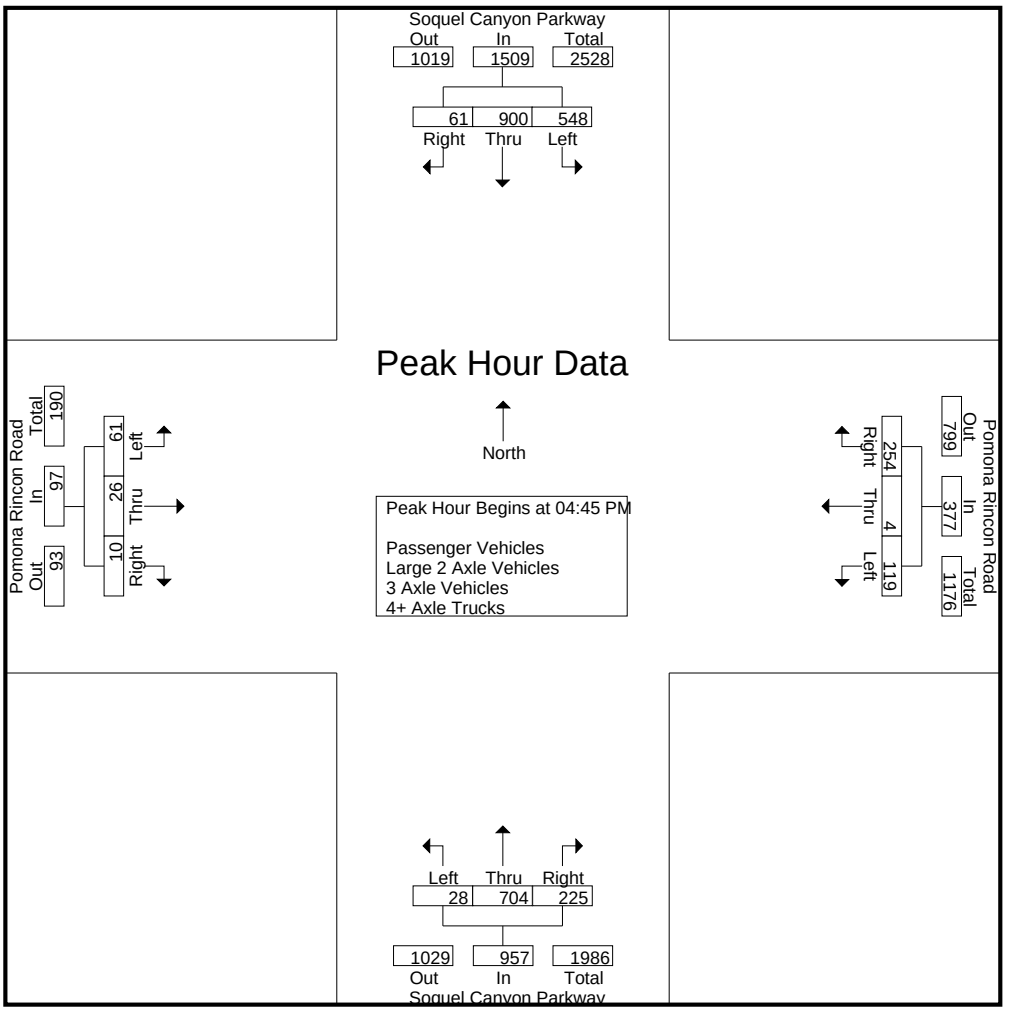
	Soquel Canyon Parkway Southbound				Pomona Rincon Road Westbound				Soquel Canyon Parkway Northbound				Pomona Rincon Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	67	238	14	319	18	2	50	70	12	177	15	204	4	3	7	14	607
04:15 PM	71	212	9	292	23	2	46	71	8	162	21	191	13	4	2	19	573
04:30 PM	97	184	19	300	24	2	52	78	10	143	22	175	12	7	2	21	574
04:45 PM	120	231	14	365	20	2	58	80	5	153	49	207	13	10	1	24	676
Total	355	865	56	1276	85	8	206	299	35	635	107	777	42	24	12	78	2430
05:00 PM	160	235	15	410	33	2	81	116	8	189	68	265	19	6	2	27	818
05:15 PM	137	222	10	369	31	0	61	92	8	196	54	258	13	3	2	18	737
05:30 PM	131	212	22	365	35	0	54	89	7	166	54	227	16	7	5	28	709
05:45 PM	118	243	14	375	19	2	49	70	6	146	52	204	10	4	0	14	663
Total	546	912	61	1519	118	4	245	367	29	697	228	954	58	20	9	87	2927
Grand Total	901	1777	117	2795	203	12	451	666	64	1332	335	1731	100	44	21	165	5357
Apprch %	32.2	63.6	4.2		30.5	1.8	67.7		3.7	76.9	19.4		60.6	26.7	12.7		
Total %	16.8	33.2	2.2	52.2	3.8	0.2	8.4	12.4	1.2	24.9	6.3	32.3	1.9	0.8	0.4	3.1	
Passenger Vehicles	900	1766	117	2783	203	12	449	664	64	1316	335	1715	100	44	20	164	5326
% Passenger Vehicles	99.9	99.4	100	99.6	100	100	99.6	99.7	100	98.8	100	99.1	100	100	95.2	99.4	99.4
Large 2 Axle Vehicles	1	10	0	11	0	0	2	2	0	12	0	12	0	0	1	1	26
% Large 2 Axle Vehicles	0.1	0.6	0	0.4	0	0	0.4	0.3	0	0.9	0	0.7	0	0	4.8	0.6	0.5
3 Axle Vehicles	0	1	0	1	0	0	0	0	0	1	0	1	0	0	0	0	2
% 3 Axle Vehicles	0	0.1	0	0	0	0	0	0	0	0.1	0	0.1	0	0	0	0	0
4+ Axle Trucks	0	0	0	0	0	0	0	0	0	3	0	3	0	0	0	0	3
% 4+ Axle Trucks	0	0	0	0	0	0	0	0	0	0.2	0	0.2	0	0	0	0	0.1

	Soquel Canyon Parkway Southbound				Pomona Rincon Road Westbound				Soquel Canyon Parkway Northbound				Pomona Rincon Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	120	231	14	365	20	**2**	58	80	5	153	49	207	13	**10**	1	24	676
05:00 PM	**160**	**235**	15	**410**	33	2	**81**	**116**	**8**	189	**68**	**265**	**19**	6	2	27	**818**
05:15 PM	137	222	10	369	31	0	61	92	8	**196**	54	258	13	3	2	18	737
05:30 PM	131	212	**22**	365	**35**	0	54	89	7	166	54	227	16	7	**5**	**28**	709
Total Volume	548	900	61	1509	119	4	254	377	28	704	225	957	61	26	10	97	2940
% App. Total	36.3	59.6	4		31.6	1.1	67.4		2.9	73.6	23.5		62.9	26.8	10.3		
PHF	.856	.957	.693	.920	.850	.500	.784	.813	.875	.898	.827	.903	.803	.650	.500	.866	.899

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268
counts@countsunlimited.com

City of Chino Hills
N/S: Soquel Canyon Parkway
E/W: Pomona Rincon Road
Weather: Clear

File Name : 10_CHH_Soquel Cyn_Pom Rincon_PM
Site Code : 05722517
Start Date : 5/24/2022
Page No : 2



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	05:00 PM				04:45 PM				04:45 PM				04:45 PM			
+0 mins.	**160**	235	15	**410**	20	**2**	58	80	5	153	49	207	13	**10**	1	24
+15 mins.	137	222	10	369	33	2	**81**	**116**	**8**	189	**68**	**265**	**19**	6	2	27
+30 mins.	131	212	**22**	365	31	0	61	92	8	**196**	54	258	13	3	2	18
+45 mins.	118	**243**	14	375	**35**	0	54	89	7	166	54	227	16	7	**5**	**28**
Total Volume	546	912	61	1519	119	4	254	377	28	704	225	957	61	26	10	97
% App. Total	35.9	60	4		31.6	1.1	67.4		2.9	73.6	23.5		62.9	26.8	10.3	
PHF	.853	.938	.693	.926	.850	.500	.784	.813	.875	.898	.827	.903	.803	.650	.500	.866

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268
counts@countsunlimited.com

City of Chino Hills
N/S: Soquel Canyon Parkway
E/W: Pomona Rincon Road
Weather: Clear

File Name : 10_CHH_Soquel Cyn_Pom Rincon_PM
Site Code : 05722517
Start Date : 5/24/2022
Page No : 1

Groups Printed- Passenger Vehicles

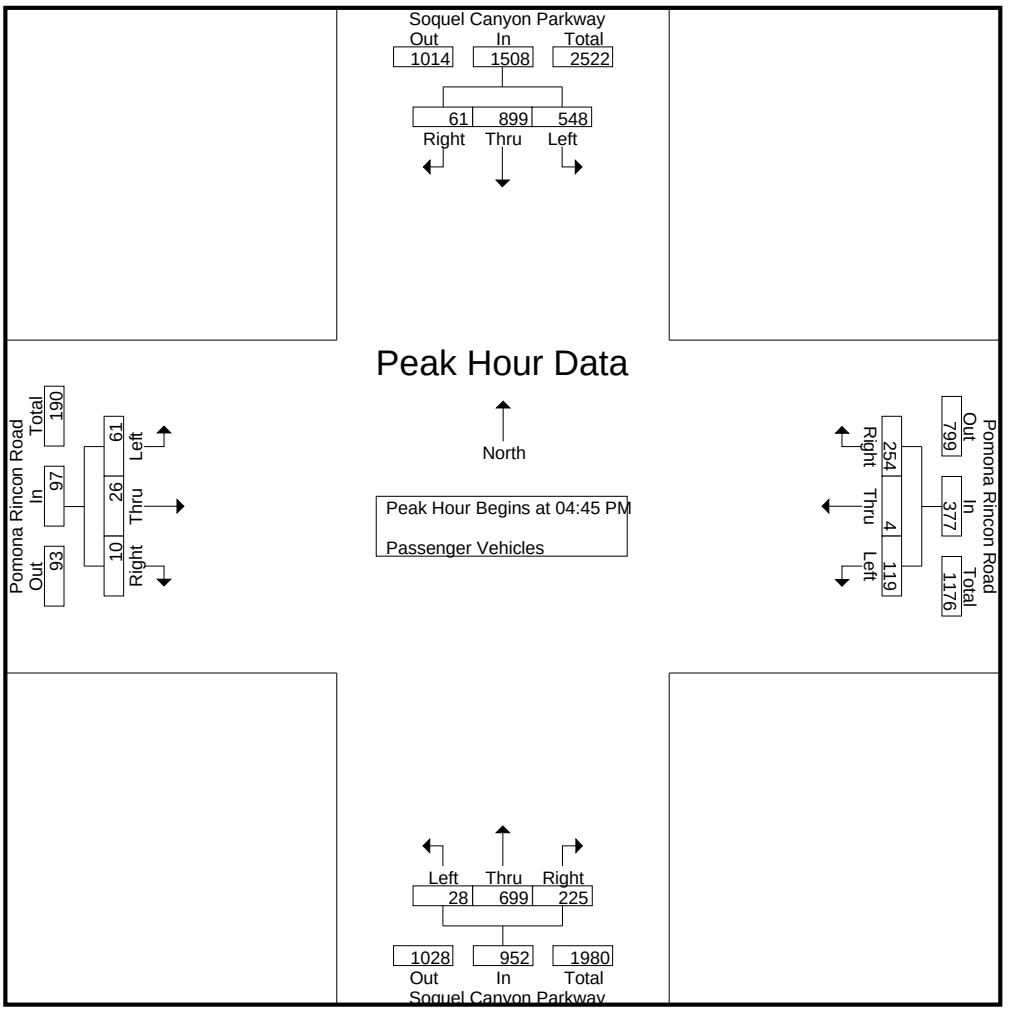
	Soquel Canyon Parkway Southbound				Pomona Rincon Road Westbound				Soquel Canyon Parkway Northbound				Pomona Rincon Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	67	235	14	316	18	2	50	70	12	173	15	200	4	3	6	13	599
04:15 PM	71	208	9	288	23	2	44	69	8	159	21	188	13	4	2	19	564
04:30 PM	97	182	19	298	24	2	52	78	10	141	22	173	12	7	2	21	570
04:45 PM	120	231	14	365	20	2	58	80	5	153	49	207	13	10	1	24	676
Total	355	856	56	1267	85	8	204	297	35	626	107	768	42	24	11	77	2409
05:00 PM	160	235	15	410	33	2	81	116	8	187	68	263	19	6	2	27	816
05:15 PM	137	222	10	369	31	0	61	92	8	194	54	256	13	3	2	18	735
05:30 PM	131	211	22	364	35	0	54	89	7	165	54	226	16	7	5	28	707
05:45 PM	117	242	14	373	19	2	49	70	6	144	52	202	10	4	0	14	659
Total	545	910	61	1516	118	4	245	367	29	690	228	947	58	20	9	87	2917
Grand Total	900	1766	117	2783	203	12	449	664	64	1316	335	1715	100	44	20	164	5326
Apprch %	32.3	63.5	4.2		30.6	1.8	67.6		3.7	76.7	19.5		61	26.8	12.2		
Total %	16.9	33.2	2.2	52.3	3.8	0.2	8.4	12.5	1.2	24.7	6.3	32.2	1.9	0.8	0.4	3.1	

	Soquel Canyon Parkway Southbound				Pomona Rincon Road Westbound				Soquel Canyon Parkway Northbound				Pomona Rincon Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:45 PM to 05:30 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	120	231	14	365	20	**2**	58	80	5	153	49	207	13	**10**	1	24	676
05:00 PM	**160**	**235**	15	**410**	33	2	**81**	**116**	**8**	187	**68**	**263**	**19**	6	2	27	**816**
05:15 PM	137	222	10	369	31	0	61	92	8	**194**	54	256	13	3	2	18	735
05:30 PM	131	211	**22**	364	**35**	0	54	89	7	165	54	226	16	7	**5**	**28**	707
Total Volume	548	899	61	1508	119	4	254	377	28	699	225	952	61	26	10	97	2934
% App. Total	36.3	59.6	4		31.6	1.1	67.4		2.9	73.4	23.6		62.9	26.8	10.3		
PHF	.856	.956	.693	.920	.850	.500	.784	.813	.875	.901	.827	.905	.803	.650	.500	.866	.899

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268
counts@countsunlimited.com

City of Chino Hills
N/S: Soquel Canyon Parkway
E/W: Pomona Rincon Road
Weather: Clear

File Name : 10_CHH_Soquel Cyn_Pom Rincon_PM
Site Code : 05722517
Start Date : 5/24/2022



Peak Hour Analysis From 04:45 PM to 05:30 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:45 PM				04:45 PM				04:45 PM				04:45 PM			
+0 mins.	120	231	14	365	20	**2**	58	80	5	153	49	207	13	**10**	1	24
+15 mins.	**160**	**235**	15	**410**	33	2	**81**	**116**	**8**	187	**68**	**263**	**19**	6	2	27
+30 mins.	137	222	10	369	31	0	61	92	8	**194**	54	256	13	3	2	18
+45 mins.	131	211	**22**	364	**35**	0	54	89	7	165	54	226	16	7	**5**	**28**
Total Volume	548	899	61	1508	119	4	254	377	28	699	225	952	61	26	10	97
% App. Total	36.3	59.6	4		31.6	1.1	67.4		2.9	73.4	23.6		62.9	26.8	10.3	
PHF	.856	.956	.693	.920	.850	.500	.784	.813	.875	.901	.827	.905	.803	.650	.500	.866

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268
counts@countsunlimited.com

City of Chino Hills
N/S: Soquel Canyon Parkway
E/W: Pomona Rincon Road
Weather: Clear

File Name : 10_CHH_Soquel Cyn_Pom Rincon_PM
Site Code : 05722517
Start Date : 5/24/2022
Page No : 1

Groups Printed- Large 2 Axle Vehicles

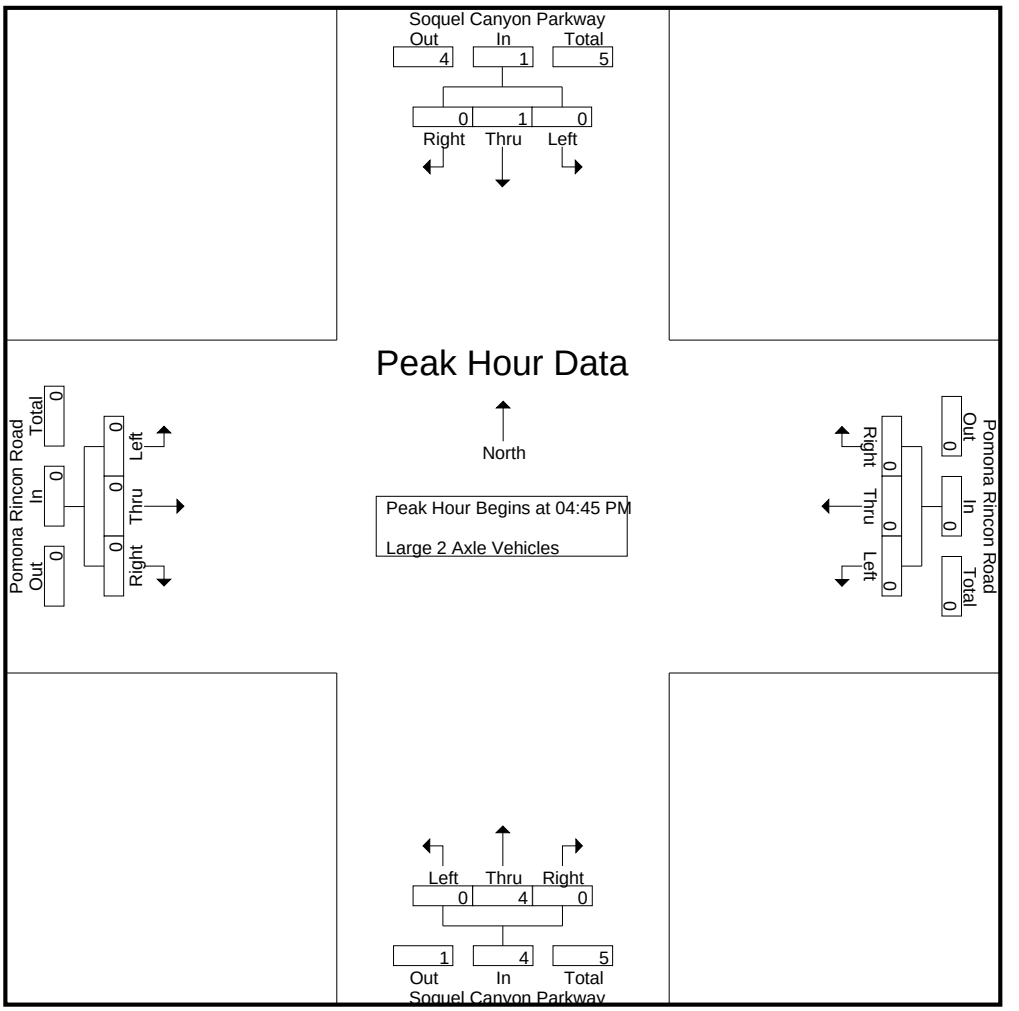
	Soquel Canyon Parkway Southbound				Pomona Rincon Road Westbound				Soquel Canyon Parkway Northbound				Pomona Rincon Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	0	3	0	3	0	0	0	0	0	2	0	2	0	0	1	1	6
04:15 PM	0	4	0	4	0	0	2	2	0	3	0	3	0	0	0	0	9
04:30 PM	0	1	0	1	0	0	0	0	0	1	0	1	0	0	0	0	2
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	8	0	8	0	0	2	2	0	6	0	6	0	0	1	1	17
05:00 PM	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1
05:15 PM	0	0	0	0	0	0	0	0	0	2	0	2	0	0	0	0	2
05:30 PM	0	1	0	1	0	0	0	0	0	1	0	1	0	0	0	0	2
05:45 PM	1	1	0	2	0	0	0	0	0	2	0	2	0	0	0	0	4
Total	1	2	0	3	0	0	0	0	0	6	0	6	0	0	0	0	9
Grand Total	1	10	0	11	0	0	2	2	0	12	0	12	0	0	1	1	26
Apprch %	9.1	90.9	0		0	0	100		0	100	0		0	0	100		
Total %	3.8	38.5	0	42.3	0	0	7.7	7.7	0	46.2	0	46.2	0	0	3.8	3.8	

	Soquel Canyon Parkway Southbound				Pomona Rincon Road Westbound				Soquel Canyon Parkway Northbound				Pomona Rincon Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:45 PM to 05:30 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1
05:15 PM	0	0	0	0	0	0	0	0	0	**2**	0	**2**	0	0	0	0	**2**
05:30 PM	0	**1**	0	**1**	0	0	0	0	0	1	0	1	0	0	0	0	2
Total Volume	0	1	0	1	0	0	0	0	0	4	0	4	0	0	0	0	5
% App. Total	0	100	0		0	0	0		0	100	0		0	0	0		
PHF	.000	.250	.000	.250	.000	.000	.000	.000	.000	.500	.000	.500	.000	.000	.000	.000	.625

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268
counts@countsunlimited.com

City of Chino Hills
N/S: Soquel Canyon Parkway
E/W: Pomona Rincon Road
Weather: Clear

File Name : 10_CHH_Soquel Cyn_Pom Rincon_PM
Site Code : 05722517
Start Date : 5/24/2022



Peak Hour Analysis From 04:45 PM to 05:30 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:45 PM				04:45 PM				04:45 PM				04:45 PM			
+0 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0	**2**	0	**2**	0	0	0	0
+45 mins.	0	**1**	0	**1**	0	0	0	0	0	1	0	1	0	0	0	0
Total Volume	0	1	0	1	0	0	0	0	0	4	0	4	0	0	0	0
% App. Total	0	100	0		0	0	0		0	100	0		0	0	0	
PHF	.000	.250	.000	.250	.000	.000	.000	.000	.000	.500	.000	.500	.000	.000	.000	.000

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268
counts@countsunlimited.com

City of Chino Hills
N/S: Soquel Canyon Parkway
E/W: Pomona Rincon Road
Weather: Clear

File Name : 10_CHH_Soquel Cyn_Pom Rincon_PM
Site Code : 05722517
Start Date : 5/24/2022
Page No : 1

Groups Printed- 3 Axle Vehicles

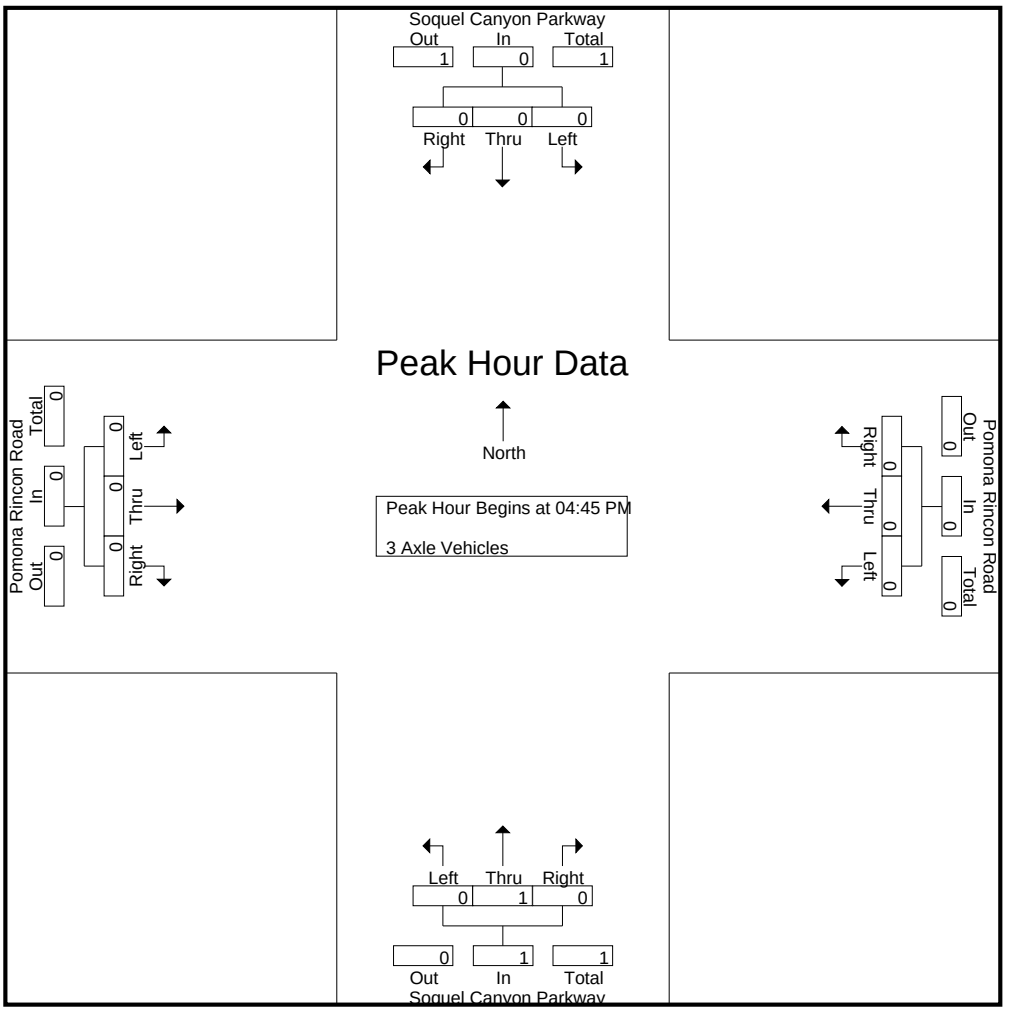
	Soquel Canyon Parkway Southbound				Pomona Rincon Road Westbound				Soquel Canyon Parkway Northbound				Pomona Rincon Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
05:00 PM	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1
Grand Total	0	1	0	1	0	0	0	0	0	1	0	1	0	0	0	0	2
Apprch %	0	100	0		0	0	0		0	100	0		0	0	0		
Total %	0	50	0	50	0	0	0	0	0	50	0	50	0	0	0	0	

	Soquel Canyon Parkway Southbound				Pomona Rincon Road Westbound				Soquel Canyon Parkway Northbound				Pomona Rincon Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:45 PM to 05:30 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	0	0	0	0	**1**	0	**1**	0	0	0	0	**1**
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1
% App. Total	0	0	0		0	0	0		0	100	0		0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.250	.000	.250	.000	.000	.000	.000	.250

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268
counts@countsunlimited.com

City of Chino Hills
N/S: Soquel Canyon Parkway
E/W: Pomona Rincon Road
Weather: Clear

File Name : 10_CHH_Soquel Cyn_Pom Rincon_PM
Site Code : 05722517
Start Date : 5/24/2022



Peak Hour Analysis From 04:45 PM to 05:30 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:45 PM				04:45 PM				04:45 PM				04:45 PM			
+0 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0	**1**	0	**1**	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0
% App. Total	0	0	0		0	0	0		0	100	0		0	0	0	
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.250	.000	.250	.000	.000	.000	.000

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268
counts@countsunlimited.com

City of Chino Hills
N/S: Soquel Canyon Parkway
E/W: Pomona Rincon Road
Weather: Clear

File Name : 10_CHH_Soquel Cyn_Pom Rincon_PM
Site Code : 05722517
Start Date : 5/24/2022
Page No : 1

Groups Printed- 4+ Axle Trucks

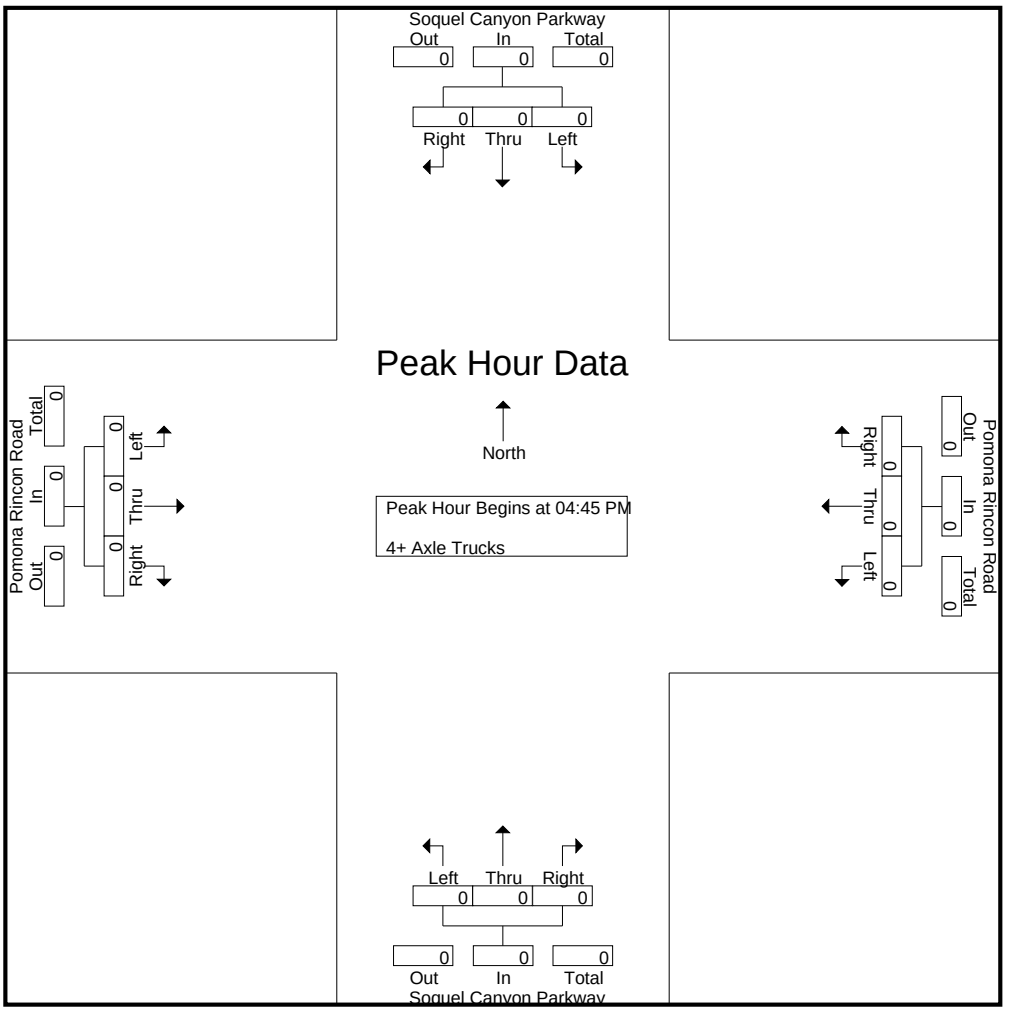
	Soquel Canyon Parkway Southbound				Pomona Rincon Road Westbound				Soquel Canyon Parkway Northbound				Pomona Rincon Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	0	0	0	0	0	0	0	0	0	2	0	2	0	0	0	0	2
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	3	0	3	0	0	0	0	3
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	3	0	3	0	0	0	0	3
Apprch %	0	0	0		0	0	0		0	100	0		0	0	0		
Total %	0	0	0	0	0	0	0	0	0	100	0	100	0	0	0	0	

	Soquel Canyon Parkway Southbound				Pomona Rincon Road Westbound				Soquel Canyon Parkway Northbound				Pomona Rincon Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:45 PM to 05:30 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0		0	0	0		0	0	0		0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268
counts@countsunlimited.com

City of Chino Hills
N/S: Soquel Canyon Parkway
E/W: Pomona Rincon Road
Weather: Clear

File Name : 10_CHH_Soquel Cyn_Pom Rincon_PM
Site Code : 05722517
Start Date : 5/24/2022



Peak Hour Analysis From 04:45 PM to 05:30 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:45 PM				04:45 PM				04:45 PM				04:45 PM			
+0 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0		0	0	0		0	0	0		0	0	0	
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951)268-6268

City of Chino Hills
N/S: Peyton Drive
E/W: Grand Avenue
Weather: Clear

File Name : CHH_Pey_Grand AM
Site Code : 05722893
Start Date : 10/4/2022
Page No : 1

Groups Printed- Passenger Vehicles - Large 2 Axle Vehicles - 3 Axle Vehicles - 4+ Axle Trucks

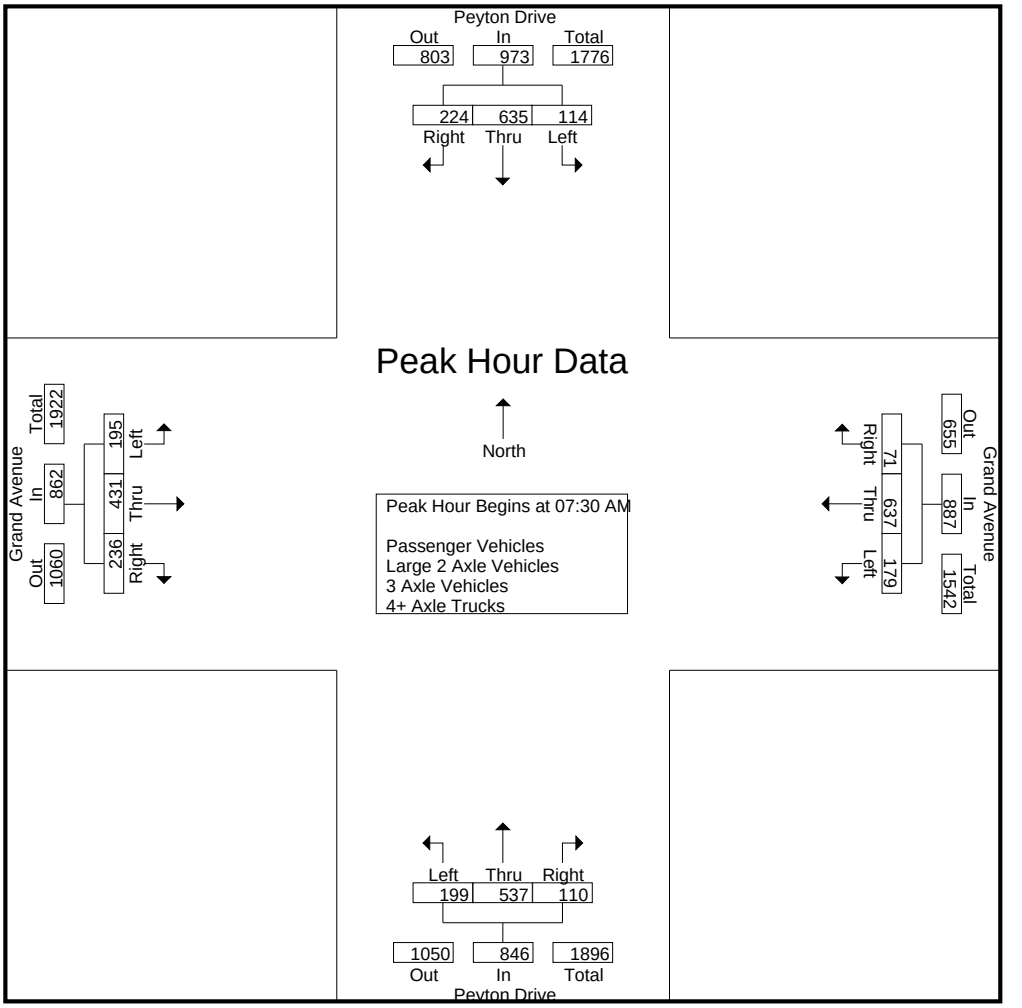
	Peyton Drive Southbound				Grand Avenue Westbound				Peyton Drive Northbound				Grand Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	11	64	39	114	23	173	15	211	7	51	7	65	16	36	15	67	457
07:15 AM	20	91	49	160	17	170	20	207	30	85	11	126	25	48	25	98	591
07:30 AM	25	133	67	225	27	223	16	266	40	109	12	161	42	78	28	148	800
07:45 AM	29	129	63	221	39	174	16	229	34	108	25	167	51	124	62	237	854
Total	85	417	218	720	106	740	67	913	111	353	55	519	134	286	130	550	2702
08:00 AM	27	192	45	264	52	125	13	190	51	134	29	214	54	120	82	256	924
08:15 AM	33	181	49	263	61	115	26	202	74	186	44	304	48	109	64	221	990
08:30 AM	19	93	36	148	28	136	28	192	64	154	34	252	40	129	32	201	793
08:45 AM	22	85	50	157	36	118	26	180	43	97	27	167	45	119	47	211	715
Total	101	551	180	832	177	494	93	764	232	571	134	937	187	477	225	889	3422
Grand Total	186	968	398	1552	283	1234	160	1677	343	924	189	1456	321	763	355	1439	6124
Apprch %	12	62.4	25.6		16.9	73.6	9.5		23.6	63.5	13		22.3	53	24.7		
Total %	3	15.8	6.5	25.3	4.6	20.2	2.6	27.4	5.6	15.1	3.1	23.8	5.2	12.5	5.8	23.5	
Passenger Vehicles	184	954	395	1533	272	1224	157	1653	340	907	181	1428	320	760	355	1435	6049
% Passenger Vehicles	98.9	98.6	99.2	98.8	96.1	99.2	98.1	98.6	99.1	98.2	95.8	98.1	99.7	99.6	100	99.7	98.8
Large 2 Axle Vehicles	2	10	2	14	8	7	2	17	3	13	4	20	0	2	0	2	53
% Large 2 Axle Vehicles	1.1	1	0.5	0.9	2.8	0.6	1.2	1	0.9	1.4	2.1	1.4	0	0.3	0	0.1	0.9
3 Axle Vehicles	0	2	1	3	1	2	1	4	0	3	2	5	0	0	0	0	12
% 3 Axle Vehicles	0	0.2	0.3	0.2	0.4	0.2	0.6	0.2	0	0.3	1.1	0.3	0	0	0	0	0.2
4+ Axle Trucks	0	2	0	2	2	1	0	3	0	1	2	3	1	1	0	2	10
% 4+ Axle Trucks	0	0.2	0	0.1	0.7	0.1	0	0.2	0	0.1	1.1	0.2	0.3	0.1	0	0.1	0.2

	Peyton Drive Southbound				Grand Avenue Westbound				Peyton Drive Northbound				Grand Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	25	133	**67**	225	27	**223**	16	**266**	40	109	12	161	42	78	28	148	800
07:45 AM	29	129	63	221	39	174	16	229	34	108	25	167	51	**124**	62	237	854
08:00 AM	27	**192**	45	**264**	52	125	13	190	51	134	29	214	**54**	120	**82**	**256**	924
08:15 AM	**33**	181	49	263	**61**	115	**26**	202	**74**	**186**	**44**	**304**	48	109	64	221	**990**
Total Volume	114	635	224	973	179	637	71	887	199	537	110	846	195	431	236	862	3568
% App. Total	11.7	65.3	23		20.2	71.8	8		23.5	63.5	13		22.6	50	27.4		
PHF	.864	.827	.836	.921	.734	.714	.683	.834	.672	.722	.625	.696	.903	.869	.720	.842	.901

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951)268-6268

City of Chino Hills
N/S: Peyton Drive
E/W: Grand Avenue
Weather: Clear

File Name : CHH_Pey_Grand AM
Site Code : 05722893
Start Date : 10/4/2022
Page No : 2



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:30 AM				07:00 AM				07:45 AM				07:45 AM			
+0 mins.	25	133	**67**	225	23	173	15	211	34	108	25	167	51	124	62	237
+15 mins.	29	129	63	221	17	170	**20**	207	51	134	29	214	**54**	120	**82**	**256**
+30 mins.	27	**192**	45	**264**	27	**223**	16	**266**	**74**	**186**	**44**	**304**	48	109	64	221
+45 mins.	**33**	181	49	263	**39**	174	16	229	64	154	34	252	40	**129**	32	201
Total Volume	114	635	224	973	106	740	67	913	223	582	132	937	193	482	240	915
% App. Total	11.7	65.3	23		11.6	81.1	7.3		23.8	62.1	14.1		21.1	52.7	26.2	
PHF	.864	.827	.836	.921	.679	.830	.838	.858	.753	.782	.750	.771	.894	.934	.732	.894

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951)268-6268

City of Chino Hills
N/S: Peyton Drive
E/W: Grand Avenue
Weather: Clear

File Name : CHH_Pey_Grand AM
Site Code : 05722893
Start Date : 10/4/2022
Page No : 1

Groups Printed- Passenger Vehicles

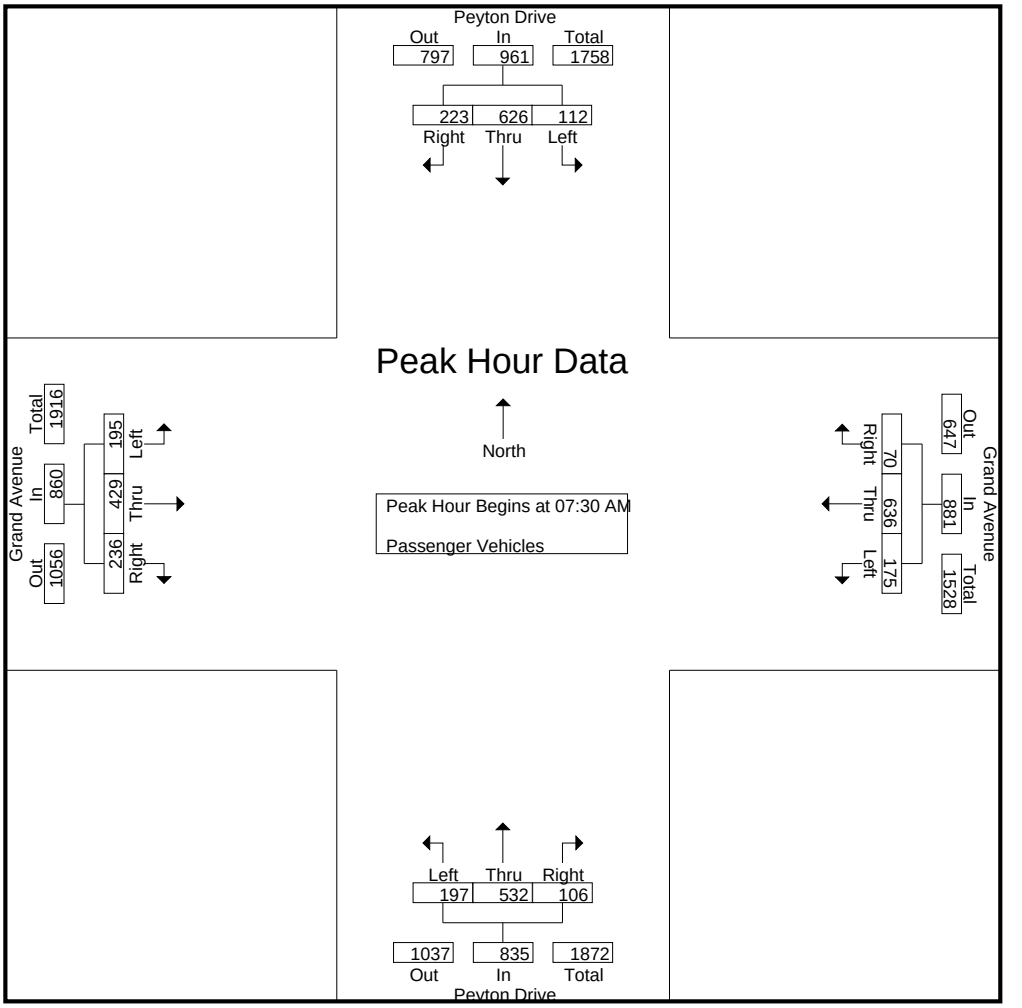
	Peyton Drive Southbound				Grand Avenue Westbound				Peyton Drive Northbound				Grand Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	11	61	39	111	23	168	14	205	7	50	7	64	15	36	15	66	446
07:15 AM	20	91	49	160	16	169	19	204	30	82	9	121	25	47	25	97	582
07:30 AM	25	130	67	222	26	222	16	264	38	108	12	158	42	78	28	148	792
07:45 AM	29	127	62	218	38	174	15	227	34	105	25	164	51	123	62	236	845
Total	85	409	217	711	103	733	64	900	109	345	53	507	133	284	130	547	2665
08:00 AM	26	191	45	262	52	125	13	190	51	134	29	214	54	120	82	256	922
08:15 AM	32	178	49	259	59	115	26	200	74	185	40	299	48	108	64	220	978
08:30 AM	19	92	35	146	25	135	28	188	63	151	34	248	40	129	32	201	783
08:45 AM	22	84	49	155	33	116	26	175	43	92	25	160	45	119	47	211	701
Total	99	545	178	822	169	491	93	753	231	562	128	921	187	476	225	888	3384
Grand Total	184	954	395	1533	272	1224	157	1653	340	907	181	1428	320	760	355	1435	6049
Apprch %	12	62.2	25.8		16.5	74	9.5		23.8	63.5	12.7		22.3	53	24.7		
Total %	3	15.8	6.5	25.3	4.5	20.2	2.6	27.3	5.6	15	3	23.6	5.3	12.6	5.9	23.7	

	Peyton Drive Southbound				Grand Avenue Westbound				Peyton Drive Northbound				Grand Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	25	130	**67**	222	26	**222**	16	**264**	38	108	12	158	42	78	28	148	792
07:45 AM	29	127	62	218	38	174	15	227	34	105	25	164	51	**123**	62	236	845
08:00 AM	26	**191**	45	**262**	52	125	13	190	51	134	29	214	**54**	120	**82**	**256**	922
08:15 AM	**32**	178	49	259	**59**	115	**26**	200	**74**	**185**	**40**	**299**	48	108	64	220	**978**
Total Volume	112	626	223	961	175	636	70	881	197	532	106	835	195	429	236	860	3537
% App. Total	11.7	65.1	23.2		19.9	72.2	7.9		23.6	63.7	12.7		22.7	49.9	27.4		
PHF	.875	.819	.832	.917	.742	.716	.673	.834	.666	.719	.663	.698	.903	.872	.720	.840	.904

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951)268-6268

City of Chino Hills
N/S: Peyton Drive
E/W: Grand Avenue
Weather: Clear

File Name : CHH_Pey_Grand AM
Site Code : 05722893
Start Date : 10/4/2022
Page No : 2



Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:30 AM				07:30 AM				07:30 AM				07:30 AM			
+0 mins.	25	130	**67**	222	26	**222**	16	**264**	38	108	12	158	42	78	28	148
+15 mins.	29	127	62	218	38	174	15	227	34	105	25	164	51	**123**	62	236
+30 mins.	26	**191**	45	**262**	52	125	13	190	51	134	29	214	**54**	120	**82**	**256**
+45 mins.	**32**	178	49	259	**59**	115	**26**	200	**74**	**185**	**40**	**299**	48	108	64	220
Total Volume	112	626	223	961	175	636	70	881	197	532	106	835	195	429	236	860
% App. Total	11.7	65.1	23.2		19.9	72.2	7.9		23.6	63.7	12.7		22.7	49.9	27.4	
PHF	.875	.819	.832	.917	.742	.716	.673	.834	.666	.719	.663	.698	.903	.872	.720	.840

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951)268-6268

City of Chino Hills
N/S: Peyton Drive
E/W: Grand Avenue
Weather: Clear

File Name : CHH_Pey_Grand AM
Site Code : 05722893
Start Date : 10/4/2022
Page No : 1

Groups Printed- Large 2 Axle Vehicles

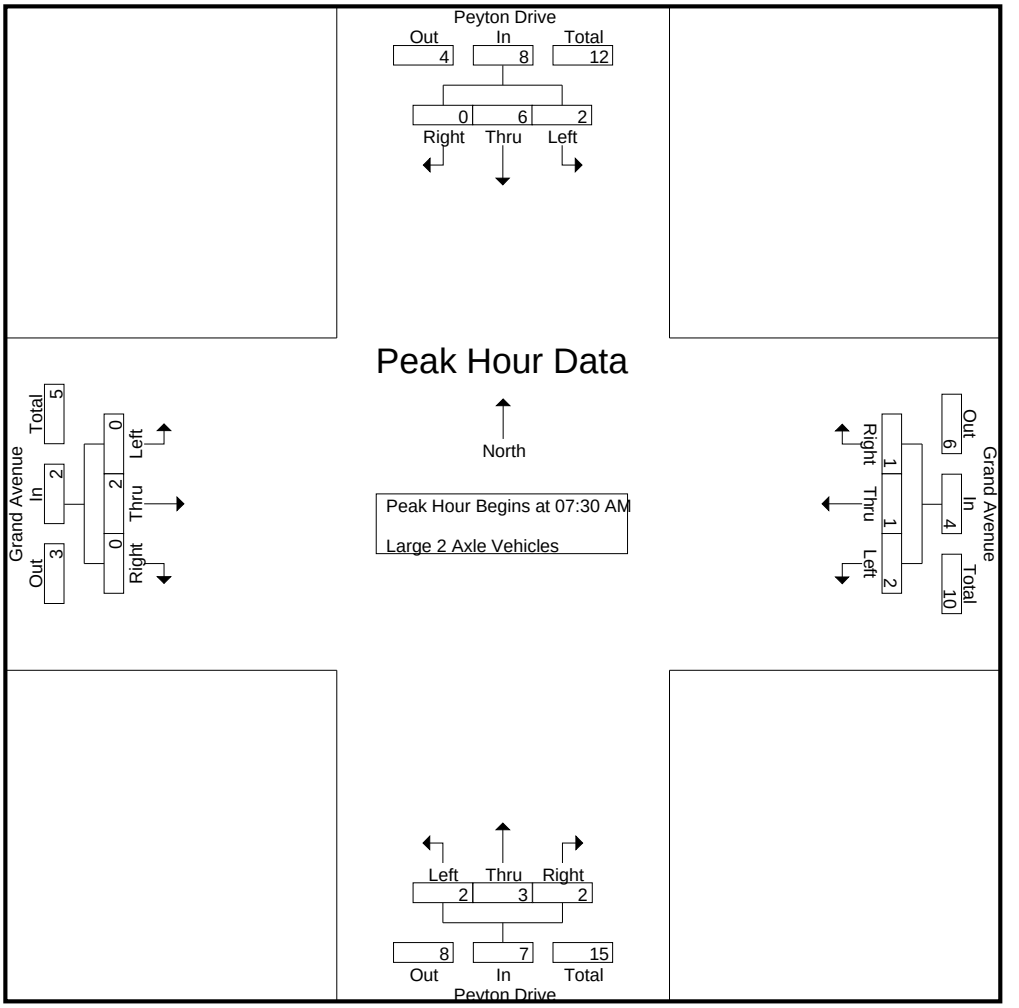
	Peyton Drive Southbound				Grand Avenue Westbound				Peyton Drive Northbound				Grand Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	0	2	0	2	0	3	0	3	0	1	0	1	0	0	0	0	6
07:15 AM	0	0	0	0	1	0	1	2	0	3	1	4	0	0	0	0	6
07:30 AM	0	2	0	2	1	1	0	2	2	0	0	2	0	0	0	0	6
07:45 AM	0	1	0	1	0	0	1	1	0	3	0	3	0	1	0	1	6
Total	0	5	0	5	2	4	2	8	2	7	1	10	0	1	0	1	24
08:00 AM	1	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
08:15 AM	1	2	0	3	1	0	0	1	0	0	2	2	0	1	0	1	7
08:30 AM	0	1	1	2	2	1	0	3	1	1	0	2	0	0	0	0	7
08:45 AM	0	1	1	2	3	2	0	5	0	5	1	6	0	0	0	0	13
Total	2	5	2	9	6	3	0	9	1	6	3	10	0	1	0	1	29
Grand Total	2	10	2	14	8	7	2	17	3	13	4	20	0	2	0	2	53
Apprch %	14.3	71.4	14.3		47.1	41.2	11.8		15	65	20		0	100	0		
Total %	3.8	18.9	3.8	26.4	15.1	13.2	3.8	32.1	5.7	24.5	7.5	37.7	0	3.8	0	3.8	

	Peyton Drive Southbound				Grand Avenue Westbound				Peyton Drive Northbound				Grand Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	0	**2**	0	2	**1**	**1**	0	**2**	**2**	0	0	2	0	0	0	0	6
07:45 AM	0	1	0	1	0	0	**1**	1	0	**3**	0	**3**	0	**1**	0	**1**	6
08:00 AM	**1**	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
08:15 AM	1	2	0	**3**	1	0	0	1	0	0	**2**	2	0	1	0	1	**7**
Total Volume	2	6	0	8	2	1	1	4	2	3	2	7	0	2	0	2	21
% App. Total	25	75	0		50	25	25		28.6	42.9	28.6		0	100	0		
PHF	.500	.750	.000	.667	.500	.250	.250	.500	.250	.250	.250	.583	.000	.500	.000	.500	.750

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951)268-6268

City of Chino Hills
N/S: Peyton Drive
E/W: Grand Avenue
Weather: Clear

File Name : CHH_Pey_Grand AM
Site Code : 05722893
Start Date : 10/4/2022
Page No : 2



Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:30 AM				07:30 AM				07:30 AM				07:30 AM			
+0 mins.	0	**2**	0	2	**1**	**1**	0	**2**	**2**	0	0	2	0	0	0	0
+15 mins.	0	1	0	1	0	0	**1**	1	0	**3**	0	**3**	0	**1**	0	**1**
+30 mins.	**1**	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0
+45 mins.	1	2	0	**3**	1	0	0	1	0	0	**2**	2	0	1	0	1
Total Volume	2	6	0	8	2	1	1	4	2	3	2	7	0	2	0	2
% App. Total	25	75	0		50	25	25		28.6	42.9	28.6		0	100	0	
PHF	.500	.750	.000	.667	.500	.250	.250	.500	.250	.250	.250	.583	.000	.500	.000	.500

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951)268-6268

City of Chino Hills
N/S: Peyton Drive
E/W: Grand Avenue
Weather: Clear

File Name : CHH_Pey_Grand AM
Site Code : 05722893
Start Date : 10/4/2022
Page No : 1

Groups Printed- 3 Axle Vehicles

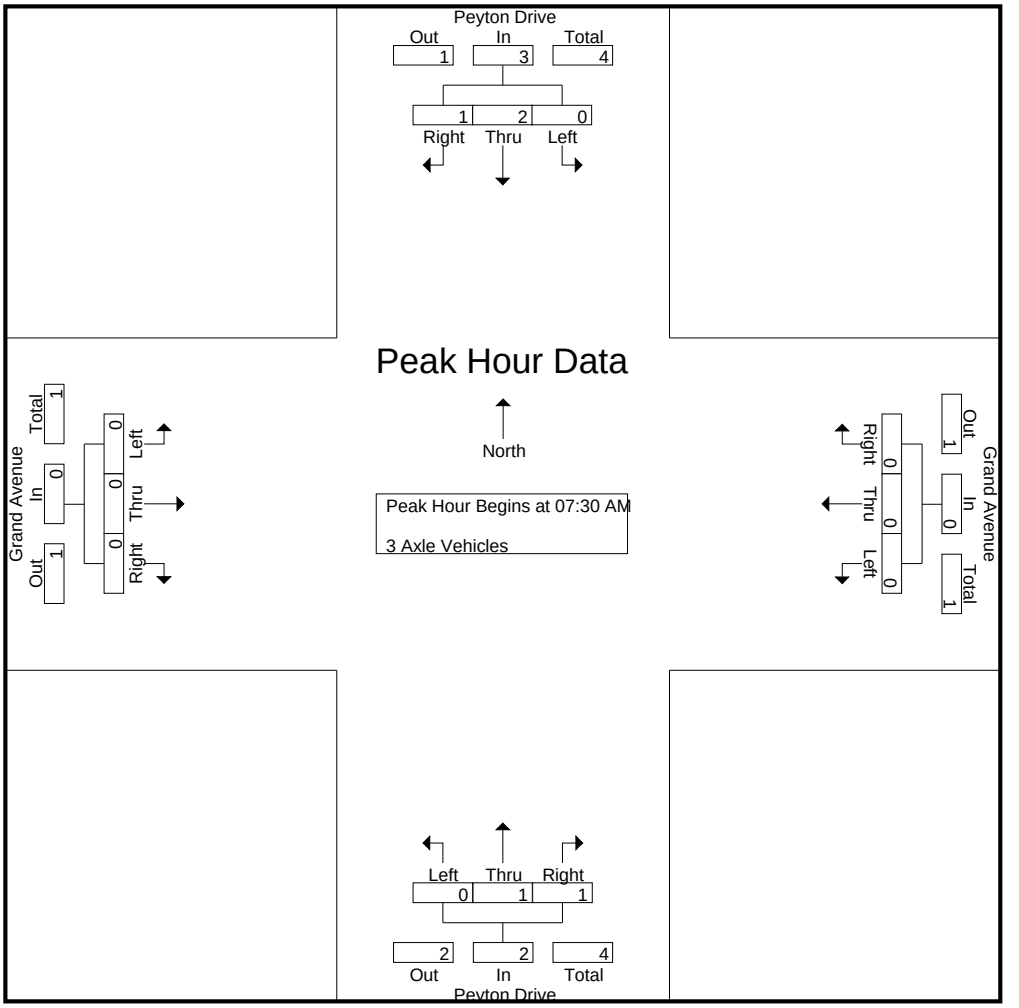
	Peyton Drive Southbound				Grand Avenue Westbound				Peyton Drive Northbound				Grand Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	0	0	0	0	0	2	1	3	0	0	0	0	0	0	0	0	3
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1
07:45 AM	0	1	1	2	0	0	0	0	0	0	0	0	0	0	0	0	2
Total	0	1	1	2	0	2	1	3	0	1	0	1	0	0	0	0	6
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	1	0	1	0	0	0	0	0	0	1	1	0	0	0	0	2
08:30 AM	0	0	0	0	1	0	0	1	0	2	0	2	0	0	0	0	3
08:45 AM	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	1
Total	0	1	0	1	1	0	0	1	0	2	2	4	0	0	0	0	6
Grand Total	0	2	1	3	1	2	1	4	0	3	2	5	0	0	0	0	12
Apprch %	0	66.7	33.3		25	50	25		0	60	40		0	0	0		
Total %	0	16.7	8.3	25	8.3	16.7	8.3	33.3	0	25	16.7	41.7	0	0	0	0	

	Peyton Drive Southbound				Grand Avenue Westbound				Peyton Drive Northbound				Grand Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	0	0	0	0	0	0	0	0	0	**1**	0	**1**	0	0	0	0	1
07:45 AM	0	**1**	**1**	**2**	0	0	0	0	0	0	0	0	0	0	0	0	**2**
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	1	0	1	0	0	0	0	0	0	**1**	1	0	0	0	0	2
Total Volume	0	2	1	3	0	0	0	0	0	1	1	2	0	0	0	0	5
% App. Total	0	66.7	33.3		0	0	0		0	50	50		0	0	0		
PHF	.000	.500	.250	.375	.000	.000	.000	.000	.000	.250	.250	.500	.000	.000	.000	.000	.625

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951)268-6268

City of Chino Hills
N/S: Peyton Drive
E/W: Grand Avenue
Weather: Clear

File Name : CHH_Pey_Grand AM
Site Code : 05722893
Start Date : 10/4/2022
Page No : 2



Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:30 AM				07:30 AM				07:30 AM				07:30 AM			
+0 mins.	0	0	0	0	0	0	0	0	0	**1**	0	**1**	0	0	0	0
+15 mins.	0	**1**	**1**	**2**	0	0	0	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+45 mins.	0	1	0	1	0	0	0	0	0	0	**1**	1	0	0	0	0
Total Volume	0	2	1	3	0	0	0	0	0	1	1	2	0	0	0	0
% App. Total	0	66.7	33.3		0	0	0		0	50	50		0	0	0	
PHF	.000	.500	.250	.375	.000	.000	.000	.000	.000	.250	.250	.500	.000	.000	.000	.000

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951)268-6268

City of Chino Hills
N/S: Peyton Drive
E/W: Grand Avenue
Weather: Clear

File Name : CHH_Pey_Grand AM
Site Code : 05722893
Start Date : 10/4/2022
Page No : 1

Groups Printed- 4+ Axle Trucks

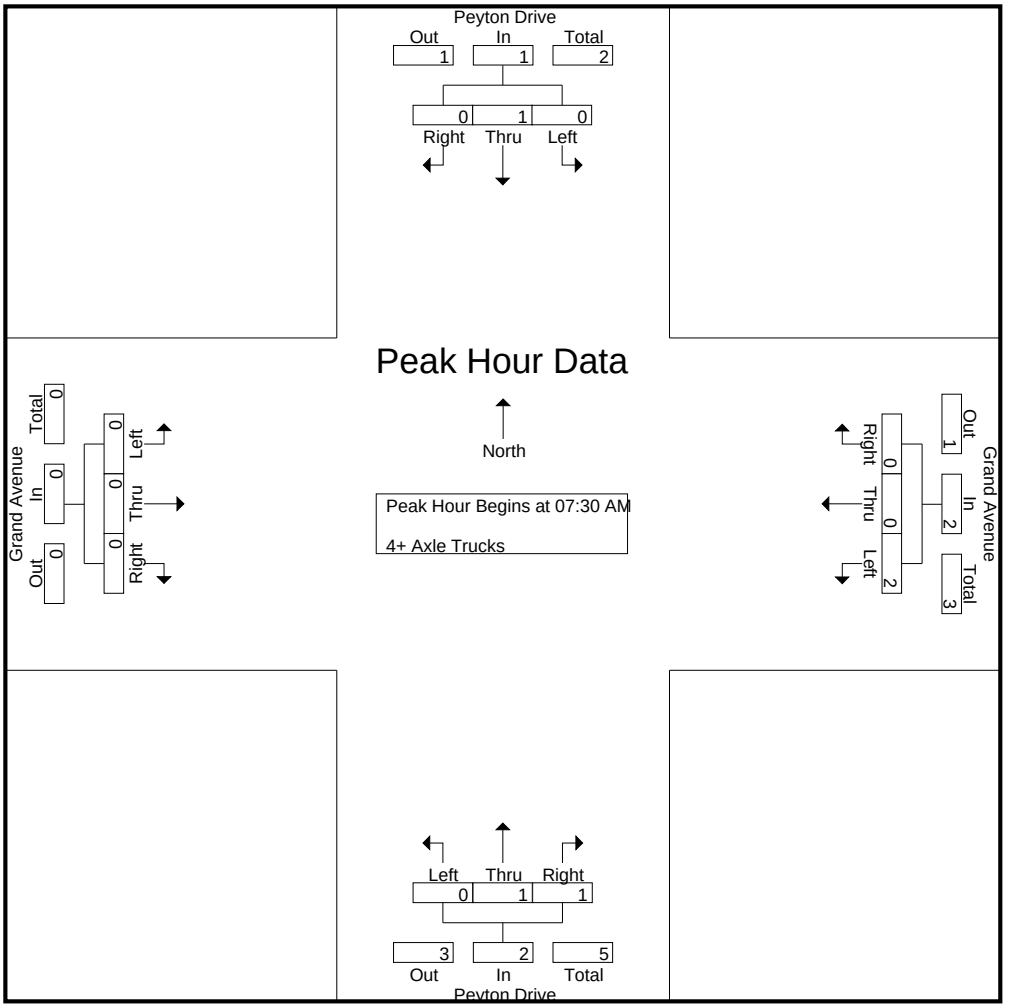
	Peyton Drive Southbound				Grand Avenue Westbound				Peyton Drive Northbound				Grand Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	0	1	0	1	0	0	0	0	0	0	0	0	1	0	0	1	2
07:15 AM	0	0	0	0	0	1	0	1	0	0	1	1	0	1	0	1	3
07:30 AM	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
07:45 AM	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	1
Total	0	2	0	2	1	1	0	2	0	0	1	1	1	1	0	2	7
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	1	0	0	1	0	1	1	2	0	0	0	0	3
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	1	0	0	1	0	1	1	2	0	0	0	0	3
Grand Total	0	2	0	2	2	1	0	3	0	1	2	3	1	1	0	2	10
Apprch %	0	100	0		66.7	33.3	0		0	33.3	66.7		50	50	0		
Total %	0	20	0	20	20	10	0	30	0	10	20	30	10	10	0	20	

	Peyton Drive Southbound				Grand Avenue Westbound				Peyton Drive Northbound				Grand Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	0	**1**	0	**1**	0	0	0	0	0	0	0	0	0	0	0	0	1
07:45 AM	0	0	0	0	**1**	0	0	**1**	0	0	0	0	0	0	0	0	1
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	1	0	0	1	0	**1**	**1**	**2**	0	0	0	0	**3**
Total Volume	0	1	0	1	2	0	0	2	0	1	1	2	0	0	0	0	5
% App. Total	0	100	0		100	0	0		0	50	50		0	0	0		
PHF	.000	.250	.000	.250	.500	.000	.000	.500	.000	.250	.250	.250	.000	.000	.000	.000	.417

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951)268-6268

City of Chino Hills
N/S: Peyton Drive
E/W: Grand Avenue
Weather: Clear

File Name : CHH_Pey_Grand AM
Site Code : 05722893
Start Date : 10/4/2022
Page No : 2



Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:30 AM				07:30 AM				07:30 AM				07:30 AM			
+0 mins.	0	**1**	0	**1**	0	0	0	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	**1**	0	0	**1**	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	1	0	0	1	0	**1**	**1**	**2**	0	0	0	0
Total Volume	0	1	0	1	2	0	0	2	0	1	1	2	0	0	0	0
% App. Total	0	100	0		100	0	0		0	50	50		0	0	0	
PHF	.000	.250	.000	.250	.500	.000	.000	.500	.000	.250	.250	.250	.000	.000	.000	.000

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951)268-6268

City of Chino Hills
N/S: Peyton Drive
E/W: Grand Avenue
Weather: Clear

File Name : CHH_Pey_Grand PM
Site Code : 05722893
Start Date : 10/4/2022
Page No : 1

Groups Printed- Passenger Vehicles - Large 2 Axle Vehicles - 3 Axle Vehicles - 4+ Axle Trucks

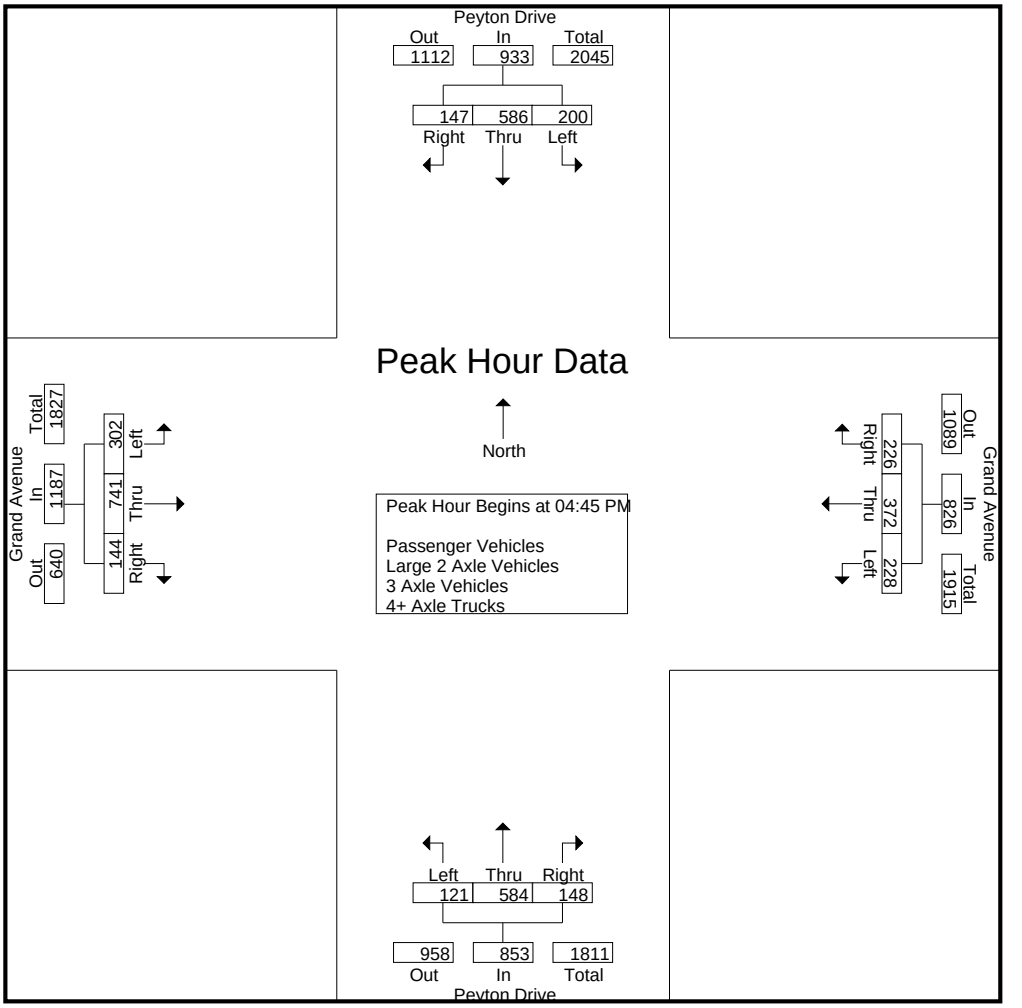
	Peyton Drive Southbound				Grand Avenue Westbound				Peyton Drive Northbound				Grand Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	34	141	29	204	54	88	54	196	17	130	43	190	64	165	29	258	848
04:15 PM	59	109	35	203	64	82	47	193	19	137	62	218	54	146	35	235	849
04:30 PM	50	145	30	225	50	75	52	177	27	153	63	243	48	133	31	212	857
04:45 PM	52	139	31	222	48	82	63	193	35	158	36	229	72	187	37	296	940
Total	195	534	125	854	216	327	216	759	98	578	204	880	238	631	132	1001	3494
05:00 PM	39	134	39	212	47	106	56	209	30	162	40	232	70	179	37	286	939
05:15 PM	49	162	31	242	62	91	55	208	27	151	37	215	80	171	28	279	944
05:30 PM	60	151	46	257	71	93	52	216	29	113	35	177	80	204	42	326	976
05:45 PM	41	151	39	231	38	95	55	188	24	131	38	193	64	176	36	276	888
Total	189	598	155	942	218	385	218	821	110	557	150	817	294	730	143	1167	3747
Grand Total	384	1132	280	1796	434	712	434	1580	208	1135	354	1697	532	1361	275	2168	7241
Apprch %	21.4	63	15.6		27.5	45.1	27.5		12.3	66.9	20.9		24.5	62.8	12.7		
Total %	5.3	15.6	3.9	24.8	6	9.8	6	21.8	2.9	15.7	4.9	23.4	7.3	18.8	3.8	29.9	
Passenger Vehicles	383	1130	280	1793	432	712	431	1575	208	1132	349	1689	527	1353	274	2154	7211
% Passenger Vehicles	99.7	99.8	100	99.8	99.5	100	99.3	99.7	100	99.7	98.6	99.5	99.1	99.4	99.6	99.4	99.6
Large 2 Axle Vehicles	1	2	0	3	1	0	3	4	0	2	5	7	5	6	1	12	26
% Large 2 Axle Vehicles	0.3	0.2	0	0.2	0.2	0	0.7	0.3	0	0.2	1.4	0.4	0.9	0.4	0.4	0.6	0.4
3 Axle Vehicles	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
% 3 Axle Vehicles	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1	0	0	0
4+ Axle Trucks	0	0	0	0	1	0	0	1	0	1	0	1	0	1	0	1	3
% 4+ Axle Trucks	0	0	0	0	0.2	0	0	0.1	0	0.1	0	0.1	0	0.1	0	0	0

	Peyton Drive Southbound				Grand Avenue Westbound				Peyton Drive Northbound				Grand Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	52	139	31	222	48	82	**63**	193	**35**	158	36	229	72	187	37	296	940
05:00 PM	39	134	39	212	47	**106**	56	209	30	**162**	**40**	**232**	70	179	37	286	939
05:15 PM	49	**162**	31	242	62	91	55	208	27	151	37	215	**80**	171	28	279	944
05:30 PM	**60**	151	**46**	**257**	**71**	93	52	**216**	29	113	35	177	80	**204**	**42**	**326**	**976**
Total Volume	200	586	147	933	228	372	226	826	121	584	148	853	302	741	144	1187	3799
% App. Total	21.4	62.8	15.8		27.6	45	27.4		14.2	68.5	17.4		25.4	62.4	12.1		
PHF	.833	.904	.799	.908	.803	.877	.897	.956	.864	.901	.925	.919	.944	.908	.857	.910	.973

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951)268-6268

City of Chino Hills
N/S: Peyton Drive
E/W: Grand Avenue
Weather: Clear

File Name : CHH_Pey_Grand PM
Site Code : 05722893
Start Date : 10/4/2022
Page No : 2



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	05:00 PM				04:45 PM				04:15 PM				04:45 PM			
+0 mins.	39	134	39	212	48	82	**63**	193	19	137	62	218	72	187	37	296
+15 mins.	49	**162**	31	242	47	**106**	56	209	27	153	**63**	**243**	70	179	37	286
+30 mins.	**60**	151	**46**	**257**	62	91	55	208	**35**	158	36	229	**80**	171	28	279
+45 mins.	41	151	39	231	**71**	93	52	**216**	30	**162**	40	232	80	**204**	**42**	**326**
Total Volume	189	598	155	942	228	372	226	826	111	610	201	922	302	741	144	1187
% App. Total	20.1	63.5	16.5		27.6	45	27.4		12	66.2	21.8		25.4	62.4	12.1	
PHF	.788	.923	.842	.916	.803	.877	.897	.956	.793	.941	.798	.949	.944	.908	.857	.910

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951)268-6268

City of Chino Hills
N/S: Peyton Drive
E/W: Grand Avenue
Weather: Clear

File Name : CHH_Pey_Grand PM
Site Code : 05722893
Start Date : 10/4/2022
Page No : 1

Groups Printed- Passenger Vehicles

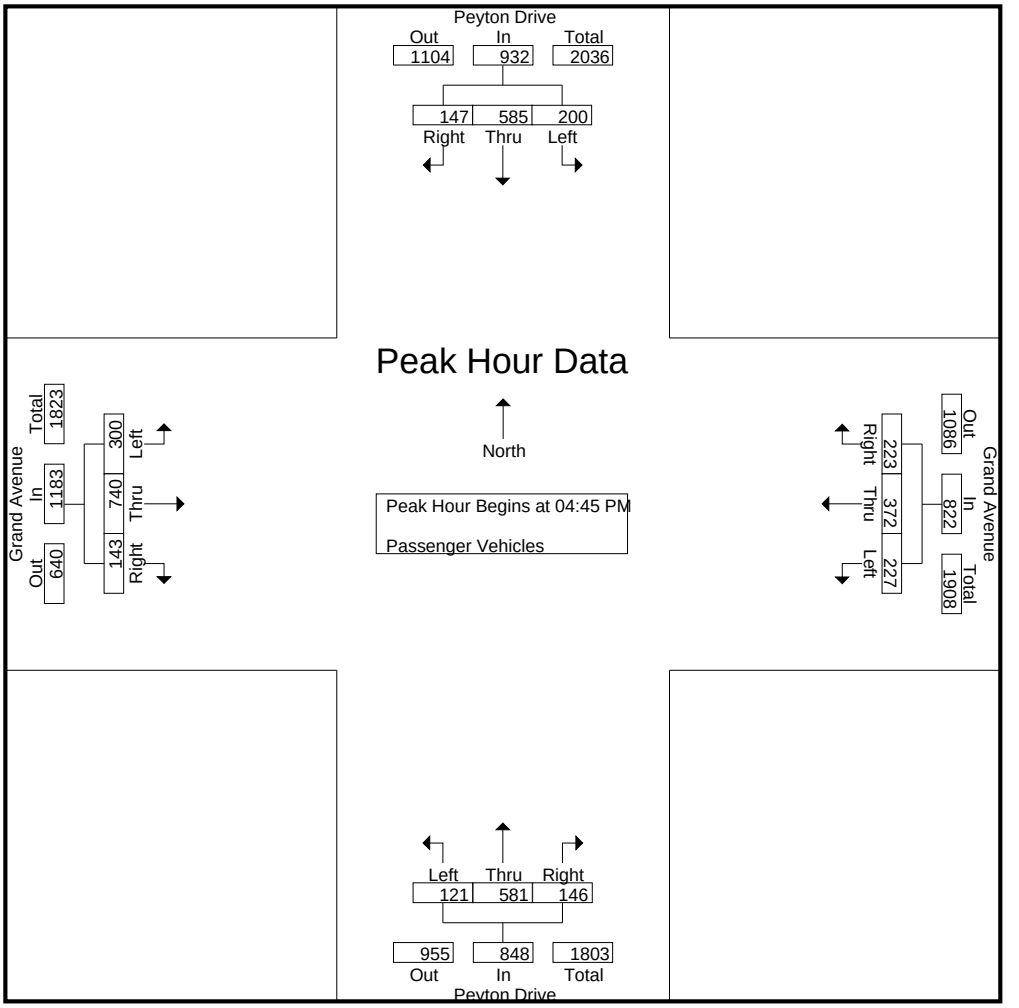
	Peyton Drive Southbound				Grand Avenue Westbound				Peyton Drive Northbound				Grand Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	34	141	29	204	54	88	54	196	17	130	42	189	63	161	29	253	842
04:15 PM	59	108	35	202	63	82	47	192	19	137	62	218	53	146	35	234	846
04:30 PM	49	145	30	224	50	75	52	177	27	153	61	241	48	131	31	210	852
04:45 PM	52	139	31	222	48	82	63	193	35	158	36	229	71	187	36	294	938
Total	194	533	125	852	215	327	216	758	98	578	201	877	235	625	131	991	3478
05:00 PM	39	134	39	212	47	106	53	206	30	159	40	229	70	179	37	286	933
05:15 PM	49	161	31	241	61	91	55	207	27	151	36	214	79	170	28	277	939
05:30 PM	60	151	46	257	71	93	52	216	29	113	34	176	80	204	42	326	975
05:45 PM	41	151	39	231	38	95	55	188	24	131	38	193	63	175	36	274	886
Total	189	597	155	941	217	385	215	817	110	554	148	812	292	728	143	1163	3733
Grand Total	383	1130	280	1793	432	712	431	1575	208	1132	349	1689	527	1353	274	2154	7211
Apprch %	21.4	63	15.6		27.4	45.2	27.4		12.3	67	20.7		24.5	62.8	12.7		
Total %	5.3	15.7	3.9	24.9	6	9.9	6	21.8	2.9	15.7	4.8	23.4	7.3	18.8	3.8	29.9	

	Peyton Drive Southbound				Grand Avenue Westbound				Peyton Drive Northbound				Grand Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:45 PM to 05:30 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	52	139	31	222	48	82	**63**	193	**35**	158	36	**229**	71	187	36	294	938
05:00 PM	39	134	39	212	47	**106**	53	206	30	**159**	**40**	229	70	179	37	286	933
05:15 PM	49	**161**	31	241	61	91	55	207	27	151	36	214	79	170	28	277	939
05:30 PM	**60**	151	**46**	**257**	**71**	93	52	**216**	29	113	34	176	**80**	**204**	**42**	**326**	**975**
Total Volume	200	585	147	932	227	372	223	822	121	581	146	848	300	740	143	1183	3785
% App. Total	21.5	62.8	15.8		27.6	45.3	27.1		14.3	68.5	17.2		25.4	62.6	12.1		
PHF	.833	.908	.799	.907	.799	.877	.885	.951	.864	.914	.913	.926	.938	.907	.851	.907	.971

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951)268-6268

City of Chino Hills
N/S: Peyton Drive
E/W: Grand Avenue
Weather: Clear

File Name : CHH_Pey_Grand PM
Site Code : 05722893
Start Date : 10/4/2022
Page No : 2



Peak Hour Analysis From 04:45 PM to 05:30 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:45 PM				04:45 PM				04:45 PM				04:45 PM			
+0 mins.	52	139	31	222	48	82	**63**	193	**35**	158	36	**229**	71	187	36	294
+15 mins.	39	134	39	212	47	**106**	53	206	30	**159**	**40**	229	70	179	37	286
+30 mins.	49	**161**	31	241	61	91	55	207	27	151	36	214	79	170	28	277
+45 mins.	**60**	151	**46**	**257**	**71**	93	52	**216**	29	113	34	176	**80**	**204**	**42**	**326**
Total Volume	200	585	147	932	227	372	223	822	121	581	146	848	300	740	143	1183
% App. Total	21.5	62.8	15.8		27.6	45.3	27.1		14.3	68.5	17.2		25.4	62.6	12.1	
PHF	.833	.908	.799	.907	.799	.877	.885	.951	.864	.914	.913	.926	.938	.907	.851	.907

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951)268-6268

City of Chino Hills
N/S: Peyton Drive
E/W: Grand Avenue
Weather: Clear

File Name : CHH_Pey_Grand PM
Site Code : 05722893
Start Date : 10/4/2022
Page No : 1

Groups Printed- Large 2 Axle Vehicles

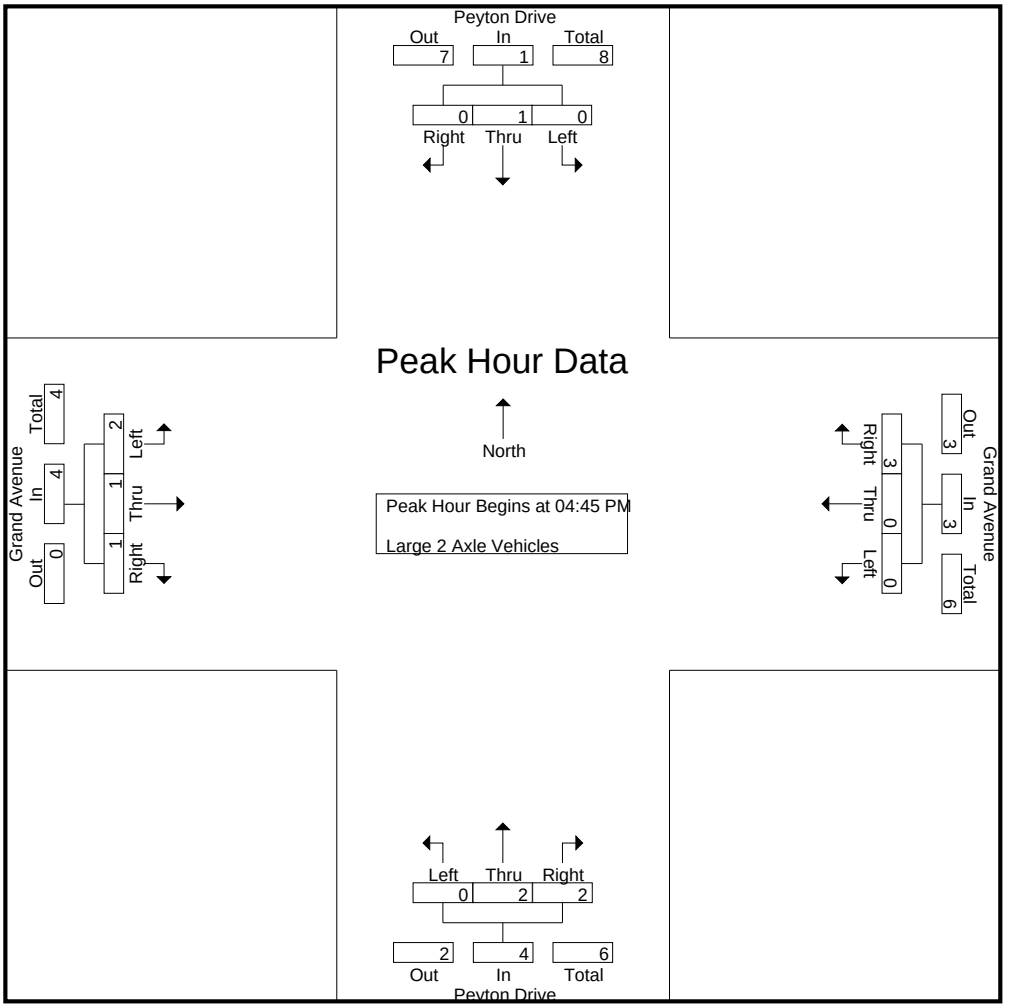
	Peyton Drive Southbound				Grand Avenue Westbound				Peyton Drive Northbound				Grand Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	0	0	0	0	0	0	0	0	0	0	1	1	1	4	0	5	6
04:15 PM	0	1	0	1	1	0	0	1	0	0	0	0	1	0	0	1	3
04:30 PM	1	0	0	1	0	0	0	0	0	0	2	2	0	1	0	1	4
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	2	2
Total	1	1	0	2	1	0	0	1	0	0	3	3	3	5	1	9	15
05:00 PM	0	0	0	0	0	0	3	3	0	2	0	2	0	0	0	0	5
05:15 PM	0	1	0	1	0	0	0	0	0	0	1	1	1	1	0	2	4
05:30 PM	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	1
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
Total	0	1	0	1	0	0	3	3	0	2	2	4	2	1	0	3	11
Grand Total	1	2	0	3	1	0	3	4	0	2	5	7	5	6	1	12	26
Apprch %	33.3	66.7	0		25	0	75		0	28.6	71.4		41.7	50	8.3		
Total %	3.8	7.7	0	11.5	3.8	0	11.5	15.4	0	7.7	19.2	26.9	19.2	23.1	3.8	46.2	

	Peyton Drive Southbound				Grand Avenue Westbound				Peyton Drive Northbound				Grand Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:45 PM to 05:30 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	**1**	0	**1**	**2**	2
05:00 PM	0	0	0	0	0	0	**3**	**3**	0	**2**	0	**2**	0	0	0	0	**5**
05:15 PM	0	**1**	0	**1**	0	0	0	0	0	0	**1**	1	1	**1**	0	2	4
05:30 PM	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	1
Total Volume	0	1	0	1	0	0	3	3	0	2	2	4	2	1	1	4	12
% App. Total	0	100	0		0	0	100		0	50	50		50	25	25		
PHF	.000	.250	.000	.250	.000	.000	.250	.250	.000	.250	.500	.500	.500	.250	.250	.500	.600

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951)268-6268

City of Chino Hills
N/S: Peyton Drive
E/W: Grand Avenue
Weather: Clear

File Name : CHH_Pey_Grand PM
Site Code : 05722893
Start Date : 10/4/2022
Page No : 2



Peak Hour Analysis From 04:45 PM to 05:30 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:45 PM				04:45 PM				04:45 PM				04:45 PM			
+0 mins.	0	0	0	0	0	0	0	0	0	0	0	0	**1**	0	**1**	**2**
+15 mins.	0	0	0	0	0	0	**3**	**3**	0	**2**	0	**2**	0	0	0	0
+30 mins.	0	**1**	0	**1**	0	0	0	0	0	0	**1**	1	1	**1**	0	2
+45 mins.	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0
Total Volume	0	1	0	1	0	0	3	3	0	2	2	4	2	1	1	4
% App. Total	0	100	0		0	0	100		0	50	50		50	25	25	
PHF	.000	.250	.000	.250	.000	.000	.250	.250	.000	.250	.500	.500	.500	.250	.250	.500

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951)268-6268

City of Chino Hills
N/S: Peyton Drive
E/W: Grand Avenue
Weather: Clear

File Name : CHH_Pey_Grand PM
Site Code : 05722893
Start Date : 10/4/2022
Page No : 1

Groups Printed- 3 Axle Vehicles

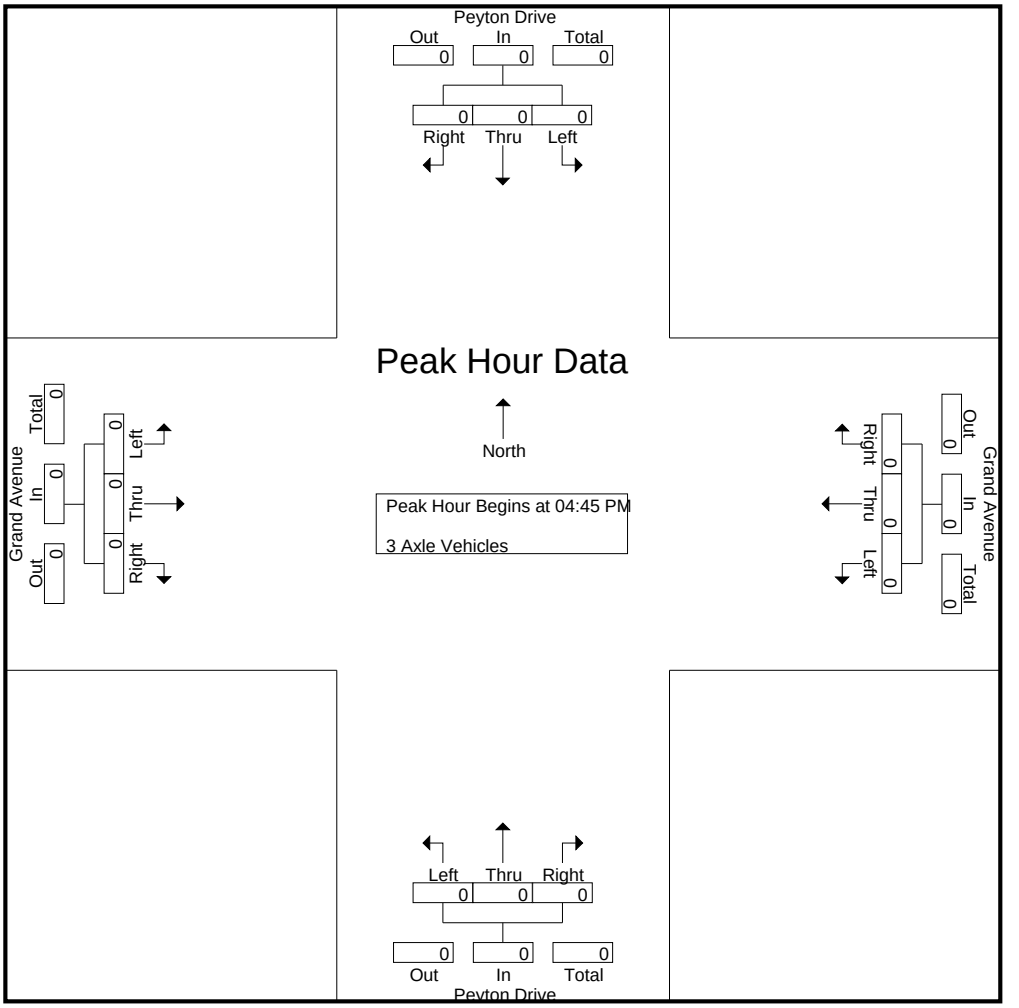
	Peyton Drive Southbound				Grand Avenue Westbound				Peyton Drive Northbound				Grand Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
Apprch %	0	0	0		0	0	0		0	0	0		0	100	0		
Total %	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	100	

	Peyton Drive Southbound				Grand Avenue Westbound				Peyton Drive Northbound				Grand Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:45 PM to 05:30 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0		0	0	0		0	0	0		0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951)268-6268

City of Chino Hills
N/S: Peyton Drive
E/W: Grand Avenue
Weather: Clear

File Name : CHH_Pey_Grand PM
Site Code : 05722893
Start Date : 10/4/2022
Page No : 2



Peak Hour Analysis From 04:45 PM to 05:30 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:45 PM				04:45 PM				04:45 PM				04:45 PM			
+0 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0		0	0	0		0	0	0		0	0	0	
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951)268-6268

City of Chino Hills
N/S: Peyton Drive
E/W: Grand Avenue
Weather: Clear

File Name : CHH_Pey_Grand PM
Site Code : 05722893
Start Date : 10/4/2022
Page No : 1

Groups Printed- 4+ Axle Trucks

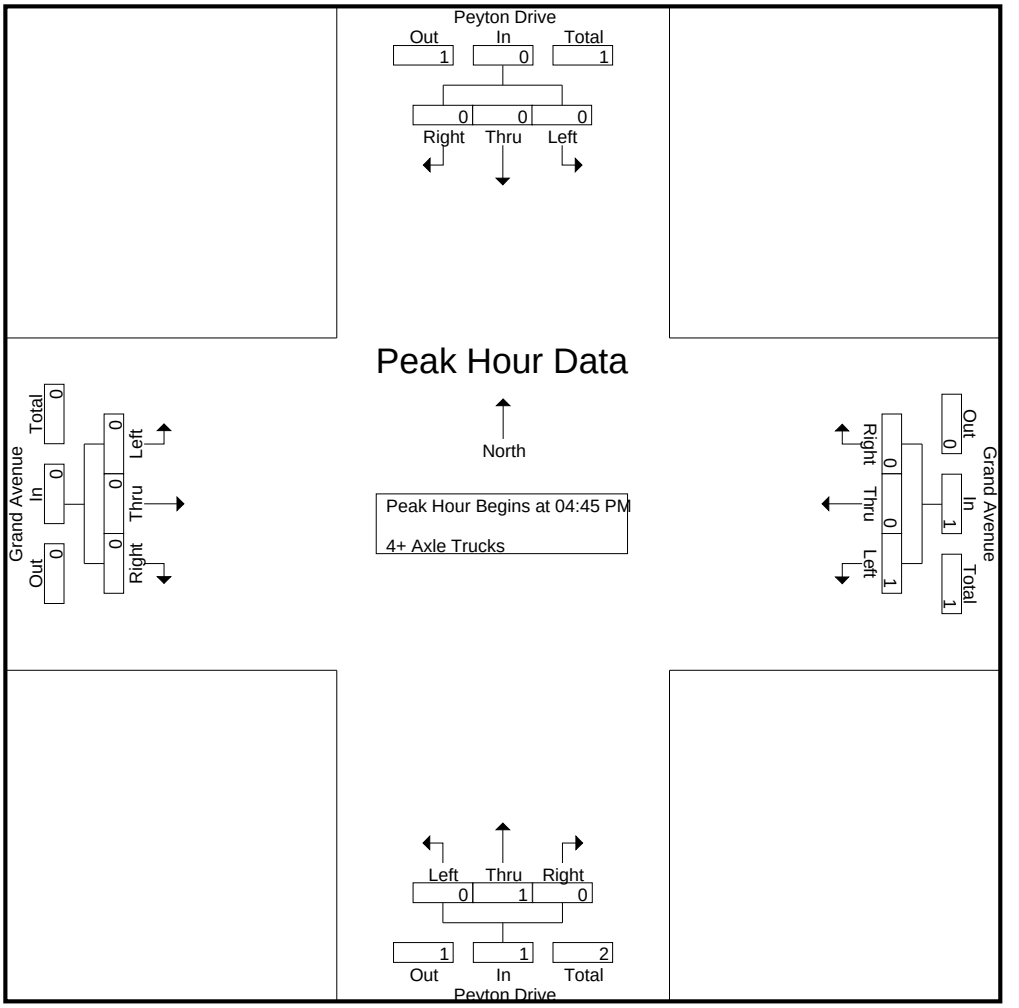
	Peyton Drive Southbound				Grand Avenue Westbound				Peyton Drive Northbound				Grand Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
05:00 PM	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1
05:15 PM	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	1
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	1	0	0	1	0	1	0	1	0	0	0	0	2
Grand Total	0	0	0	0	1	0	0	1	0	1	0	1	0	1	0	1	3
Apprch %	0	0	0		100	0	0		0	100	0		0	100	0		
Total %	0	0	0	0	33.3	0	0	33.3	0	33.3	0	33.3	0	33.3	0	33.3	

	Peyton Drive Southbound				Grand Avenue Westbound				Peyton Drive Northbound				Grand Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:45 PM to 05:30 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	0	0	0	0	**1**	0	**1**	0	0	0	0	**1**
05:15 PM	0	0	0	0	**1**	0	0	**1**	0	0	0	0	0	0	0	0	1
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	1	0	0	1	0	1	0	1	0	0	0	0	2
% App. Total	0	0	0		100	0	0		0	100	0		0	0	0		
PHF	.000	.000	.000	.000	.250	.000	.000	.250	.000	.250	.000	.250	.000	.000	.000	.000	.500

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951)268-6268

City of Chino Hills
N/S: Peyton Drive
E/W: Grand Avenue
Weather: Clear

File Name : CHH_Pey_Grand PM
Site Code : 05722893
Start Date : 10/4/2022
Page No : 2



Peak Hour Analysis From 04:45 PM to 05:30 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:45 PM				04:45 PM				04:45 PM				04:45 PM			
+0 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0	**1**	0	**1**	0	0	0	0
+30 mins.	0	0	0	0	**1**	0	0	**1**	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	1	0	0	1	0	1	0	1	0	0	0	0
% App. Total	0	0	0		100	0	0		0	100	0		0	0	0	
PHF	.000	.000	.000	.000	.250	.000	.000	.250	.000	.250	.000	.250	.000	.000	.000	.000

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268

City of Chino Hills
N/S: Carbon Canyon Road
E/W: Fairway Drive / Ginseng Lane
Weather: Clear

File Name : 01_CHHCCFAAM
Site Code : 05723534
Start Date : 5/23/2023
Page No : 1

Groups Printed- Passenger Vehicles - Large 2 Axle Vehicles - 3 Axle Vehicles - 4+ Axle Trucks

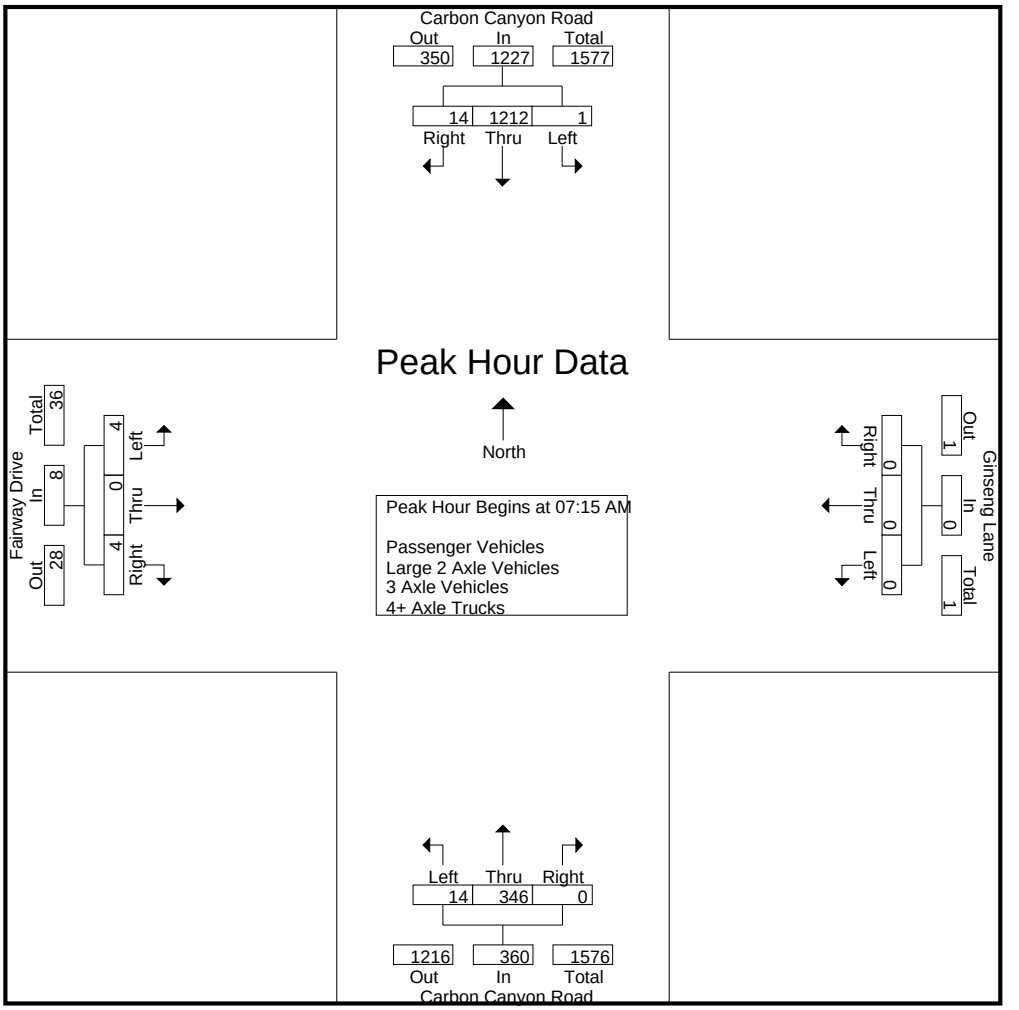
	Carbon Canyon Road Southbound				Ginseng Lane Westbound				Carbon Canyon Road Northbound				Fairway Drive Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	1	317	7	325	0	0	0	0	3	43	1	47	3	0	1	4	376
07:15 AM	0	319	2	321	0	0	0	0	4	59	0	63	1	0	0	1	385
07:30 AM	1	312	3	316	0	0	0	0	6	99	0	105	2	0	1	3	424
07:45 AM	0	289	3	292	0	0	0	0	3	87	0	90	1	0	0	1	383
Total	2	1237	15	1254	0	0	0	0	16	288	1	305	7	0	2	9	1568
08:00 AM	0	292	6	298	0	0	0	0	1	101	0	102	0	0	3	3	403
08:15 AM	0	258	0	258	0	0	0	0	1	71	0	72	1	0	1	2	332
08:30 AM	0	256	3	259	0	0	0	0	2	68	0	70	4	0	0	4	333
08:45 AM	1	195	6	202	0	0	0	0	3	85	1	89	1	0	2	3	294
Total	1	1001	15	1017	0	0	0	0	7	325	1	333	6	0	6	12	1362
Grand Total	3	2238	30	2271	0	0	0	0	23	613	2	638	13	0	8	21	2930
Apprch %	0.1	98.5	1.3		0	0	0		3.6	96.1	0.3		61.9	0	38.1		
Total %	0.1	76.4	1	77.5	0	0	0	0	0.8	20.9	0.1	21.8	0.4	0	0.3	0.7	
Passenger Vehicles	3	2227	25	2255	0	0	0	0	23	607	2	632	13	0	8	21	2908
% Passenger Vehicles	100	99.5	83.3	99.3	0	0	0	0	100	99	100	99.1	100	0	100	100	99.2
Large 2 Axle Vehicles	0	11	5	16	0	0	0	0	0	6	0	6	0	0	0	0	22
% Large 2 Axle Vehicles	0	0.5	16.7	0.7	0	0	0	0	0	1	0	0.9	0	0	0	0	0.8
3 Axle Vehicles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% 3 Axle Vehicles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4+ Axle Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% 4+ Axle Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

	Carbon Canyon Road Southbound				Ginseng Lane Westbound				Carbon Canyon Road Northbound				Fairway Drive Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	0	**319**	2	**321**	0	0	0	0	4	59	0	63	1	0	0	1	385
07:30 AM	**1**	312	3	316	0	0	0	0	**6**	99	0	**105**	**2**	0	1	**3**	**424**
07:45 AM	0	289	3	292	0	0	0	0	3	87	0	90	1	0	0	1	383
08:00 AM	0	292	**6**	298	0	0	0	0	1	**101**	0	102	0	0	**3**	3	403
Total Volume	1	1212	14	1227	0	0	0	0	14	346	0	360	4	0	4	8	1595
% App. Total	0.1	98.8	1.1		0	0	0		3.9	96.1	0		50	0	50		
PHF	.250	.950	.583	.956	.000	.000	.000	.000	.583	.856	.000	.857	.500	.000	.333	.667	.940

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268

City of Chino Hills
N/S: Carbon Canyon Road
E/W: Fairway Drive / Ginseng Lane
Weather: Clear

File Name : 01_CHHCCFAAM
Site Code : 05723534
Start Date : 5/23/2023
Page No : 2



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:00 AM				07:00 AM				07:30 AM				08:00 AM			
+0 mins.	**1**	317	**7**	**325**	0	0	0	0	**6**	99	0	**105**	0	0	**3**	3
+15 mins.	0	**319**	2	321	0	0	0	0	3	87	0	90	1	0	1	2
+30 mins.	1	312	3	316	0	0	0	0	1	**101**	0	102	**4**	0	0	**4**
+45 mins.	0	289	3	292	0	0	0	0	1	71	0	72	1	0	2	3
Total Volume	2	1237	15	1254	0	0	0	0	11	358	0	369	6	0	6	12
% App. Total	0.2	98.6	1.2		0	0	0		3	97	0		50	0	50	
PHF	.500	.969	.536	.965	.000	.000	.000	.000	.458	.886	.000	.879	.375	.000	.500	.750

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268

City of Chino Hills
N/S: Carbon Canyon Road
E/W: Fairway Drive / Ginseng Lane
Weather: Clear

File Name : 01_CHHCCFAAM
Site Code : 05723534
Start Date : 5/23/2023
Page No : 1

Groups Printed- Passenger Vehicles

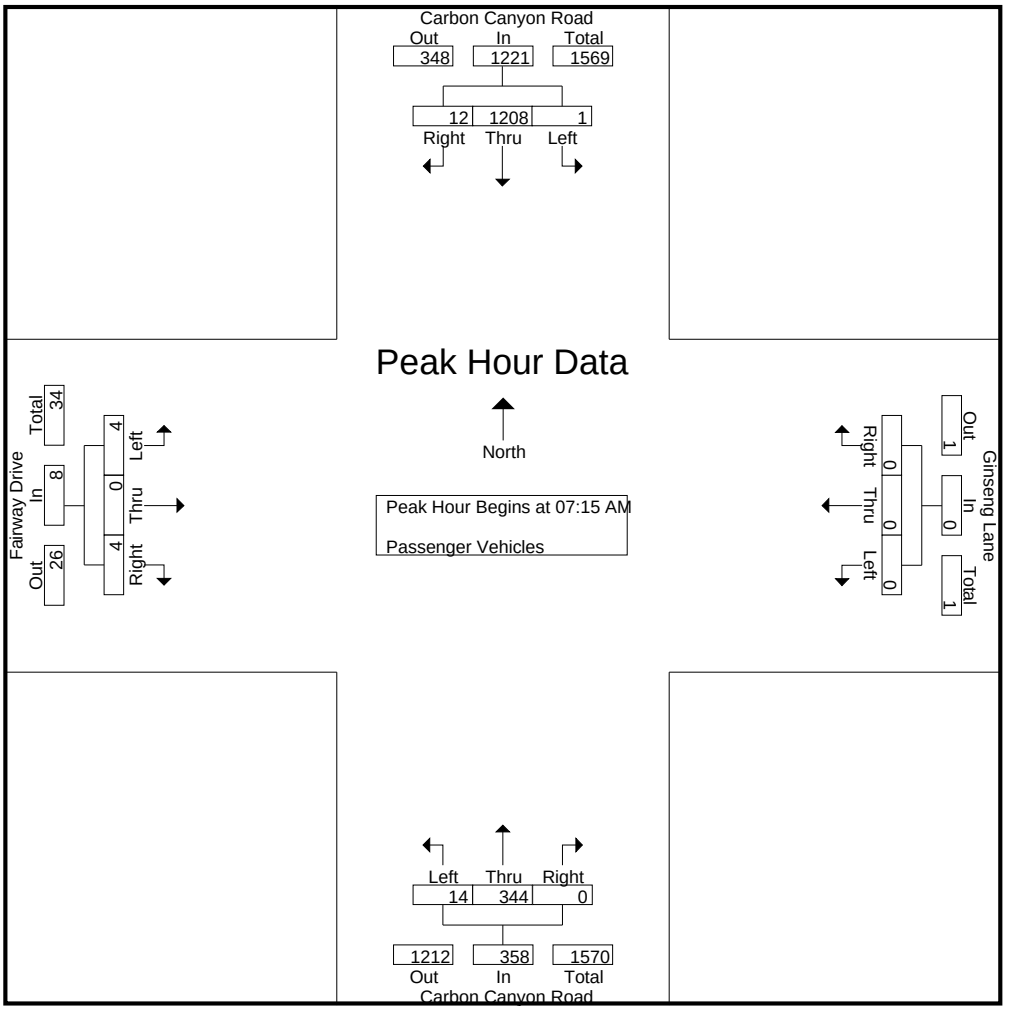
	Carbon Canyon Road Southbound				Ginseng Lane Westbound				Carbon Canyon Road Northbound				Fairway Drive Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	1	313	7	321	0	0	0	0	3	40	1	44	3	0	1	4	369
07:15 AM	0	318	2	320	0	0	0	0	4	59	0	63	1	0	0	1	384
07:30 AM	1	310	3	314	0	0	0	0	6	98	0	104	2	0	1	3	421
07:45 AM	0	288	3	291	0	0	0	0	3	86	0	89	1	0	0	1	381
Total	2	1229	15	1246	0	0	0	0	16	283	1	300	7	0	2	9	1555
08:00 AM	0	292	4	296	0	0	0	0	1	101	0	102	0	0	3	3	401
08:15 AM	0	258	0	258	0	0	0	0	1	71	0	72	1	0	1	2	332
08:30 AM	0	254	1	255	0	0	0	0	2	67	0	69	4	0	0	4	328
08:45 AM	1	194	5	200	0	0	0	0	3	85	1	89	1	0	2	3	292
Total	1	998	10	1009	0	0	0	0	7	324	1	332	6	0	6	12	1353
Grand Total	3	2227	25	2255	0	0	0	0	23	607	2	632	13	0	8	21	2908
Apprch %	0.1	98.8	1.1		0	0	0		3.6	96	0.3		61.9	0	38.1		
Total %	0.1	76.6	0.9	77.5	0	0	0	0	0.8	20.9	0.1	21.7	0.4	0	0.3	0.7	

	Carbon Canyon Road Southbound				Ginseng Lane Westbound				Carbon Canyon Road Northbound				Fairway Drive Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	0	**318**	2	**320**	0	0	0	0	4	59	0	63	1	0	0	1	384
07:30 AM	**1**	310	3	314	0	0	0	0	**6**	98	0	**104**	**2**	0	1	**3**	**421**
07:45 AM	0	288	3	291	0	0	0	0	3	86	0	89	1	0	0	1	381
08:00 AM	0	292	**4**	296	0	0	0	0	1	**101**	0	102	0	0	**3**	3	401
Total Volume	1	1208	12	1221	0	0	0	0	14	344	0	358	4	0	4	8	1587
% App. Total	0.1	98.9	1		0	0	0		3.9	96.1	0		50	0	50		
PHF	.250	.950	.750	.954	.000	.000	.000	.000	.583	.851	.000	.861	.500	.000	.333	.667	.942

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268

City of Chino Hills
N/S: Carbon Canyon Road
E/W: Fairway Drive / Ginseng Lane
Weather: Clear

File Name : 01_CHHCCFAAM
Site Code : 05723534
Start Date : 5/23/2023
Page No : 2



Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:15 AM				07:15 AM				07:15 AM				07:15 AM			
+0 mins.	0	**318**	2	**320**	0	0	0	0	4	59	0	63	1	0	0	1
+15 mins.	**1**	310	3	314	0	0	0	0	**6**	98	0	**104**	**2**	0	1	**3**
+30 mins.	0	288	3	291	0	0	0	0	3	86	0	89	1	0	0	1
+45 mins.	0	292	**4**	296	0	0	0	0	1	**101**	0	102	0	0	**3**	3
Total Volume	1	1208	12	1221	0	0	0	0	14	344	0	358	4	0	4	8
% App. Total	0.1	98.9	1		0	0	0		3.9	96.1	0		50	0	50	
PHF	.250	.950	.750	.954	.000	.000	.000	.000	.583	.851	.000	.861	.500	.000	.333	.667

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268

City of Chino Hills
N/S: Carbon Canyon Road
E/W: Fairway Drive / Ginseng Lane
Weather: Clear

File Name : 01_CHHCCFAAM
Site Code : 05723534
Start Date : 5/23/2023
Page No : 1

Groups Printed- Large 2 Axle Vehicles

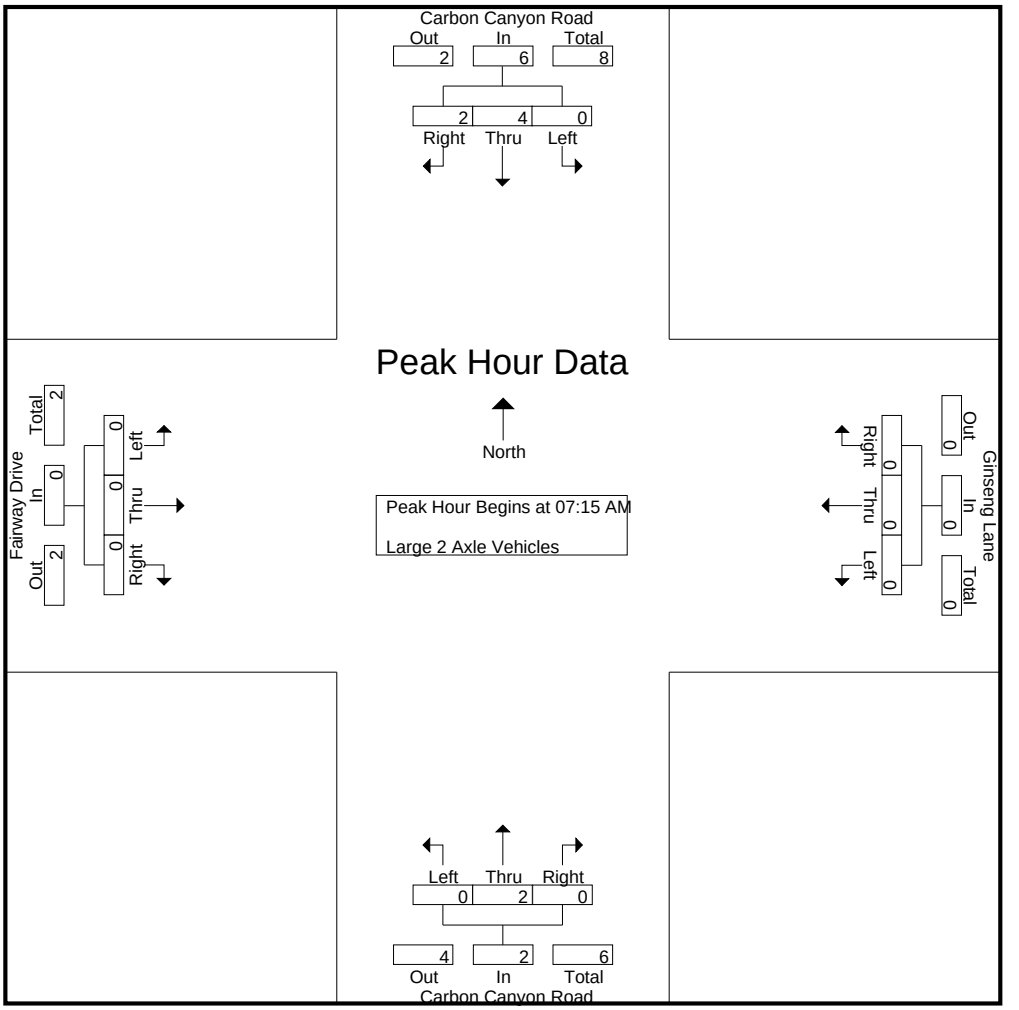
	Carbon Canyon Road Southbound				Ginseng Lane Westbound				Carbon Canyon Road Northbound				Fairway Drive Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	0	4	0	4	0	0	0	0	0	3	0	3	0	0	0	0	7
07:15 AM	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
07:30 AM	0	2	0	2	0	0	0	0	0	1	0	1	0	0	0	0	3
07:45 AM	0	1	0	1	0	0	0	0	0	1	0	1	0	0	0	0	2
Total	0	8	0	8	0	0	0	0	0	5	0	5	0	0	0	0	13
08:00 AM	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	2
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	2	2	4	0	0	0	0	0	1	0	1	0	0	0	0	5
08:45 AM	0	1	1	2	0	0	0	0	0	0	0	0	0	0	0	0	2
Total	0	3	5	8	0	0	0	0	0	1	0	1	0	0	0	0	9
Grand Total	0	11	5	16	0	0	0	0	0	6	0	6	0	0	0	0	22
Apprch %	0	68.8	31.2		0	0	0		0	100	0		0	0	0		
Total %	0	50	22.7	72.7	0	0	0	0	0	27.3	0	27.3	0	0	0	0	

	Carbon Canyon Road Southbound				Ginseng Lane Westbound				Carbon Canyon Road Northbound				Fairway Drive Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
07:30 AM	0	**2**	0	**2**	0	0	0	0	0	**1**	0	**1**	0	0	0	0	**3**
07:45 AM	0	1	0	1	0	0	0	0	0	1	0	1	0	0	0	0	2
08:00 AM	0	0	**2**	2	0	0	0	0	0	0	0	0	0	0	0	0	2
Total Volume	0	4	2	6	0	0	0	0	0	2	0	2	0	0	0	0	8
% App. Total	0	66.7	33.3		0	0	0		0	100	0		0	0	0		
PHF	.000	.500	.250	.750	.000	.000	.000	.000	.000	.500	.000	.500	.000	.000	.000	.000	.667

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268

City of Chino Hills
N/S: Carbon Canyon Road
E/W: Fairway Drive / Ginseng Lane
Weather: Clear

File Name : 01_CHHCCFAAM
Site Code : 05723534
Start Date : 5/23/2023
Page No : 2



Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:15 AM				07:15 AM				07:15 AM				07:15 AM			
+0 mins.	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0
+15 mins.	0	**2**	0	**2**	0	0	0	0	0	**1**	0	**1**	0	0	0	0
+30 mins.	0	1	0	1	0	0	0	0	0	1	0	1	0	0	0	0
+45 mins.	0	0	**2**	2	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	4	2	6	0	0	0	0	0	2	0	2	0	0	0	0
% App. Total	0	66.7	33.3		0	0	0		0	100	0		0	0	0	
PHF	.000	.500	.250	.750	.000	.000	.000	.000	.000	.500	.000	.500	.000	.000	.000	.000

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268

City of Chino Hills
N/S: Carbon Canyon Road
E/W: Fairway Drive / Ginseng Lane
Weather: Clear

File Name : 01_CHHCCFAAM
Site Code : 05723534
Start Date : 5/23/2023
Page No : 1

Groups Printed- 3 Axle Vehicles

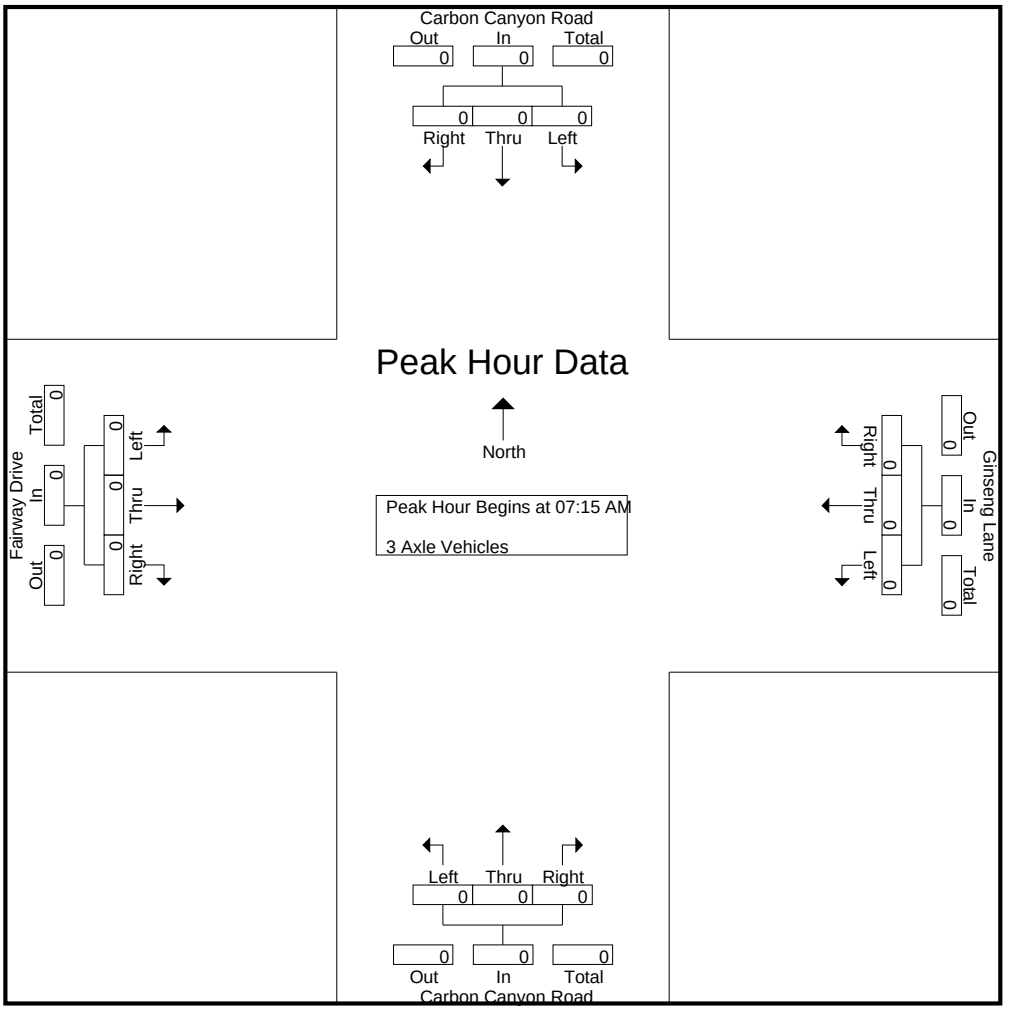
	Carbon Canyon Road Southbound				Ginseng Lane Westbound				Carbon Canyon Road Northbound				Fairway Drive Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Apprch %	0	0	0		0	0	0		0	0	0		0	0	0		
Total %																	

	Carbon Canyon Road Southbound				Ginseng Lane Westbound				Carbon Canyon Road Northbound				Fairway Drive Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0		0	0	0		0	0	0		0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268

City of Chino Hills
N/S: Carbon Canyon Road
E/W: Fairway Drive / Ginseng Lane
Weather: Clear

File Name : 01_CHHCCFAAM
Site Code : 05723534
Start Date : 5/23/2023
Page No : 2



Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:15 AM				07:15 AM				07:15 AM				07:15 AM			
+0 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0		0	0	0		0	0	0		0	0	0	
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268

City of Chino Hills
N/S: Carbon Canyon Road
E/W: Fairway Drive / Ginseng Lane
Weather: Clear

File Name : 01_CHHCCFAAM
Site Code : 05723534
Start Date : 5/23/2023
Page No : 1

Groups Printed- 4+ Axle Trucks

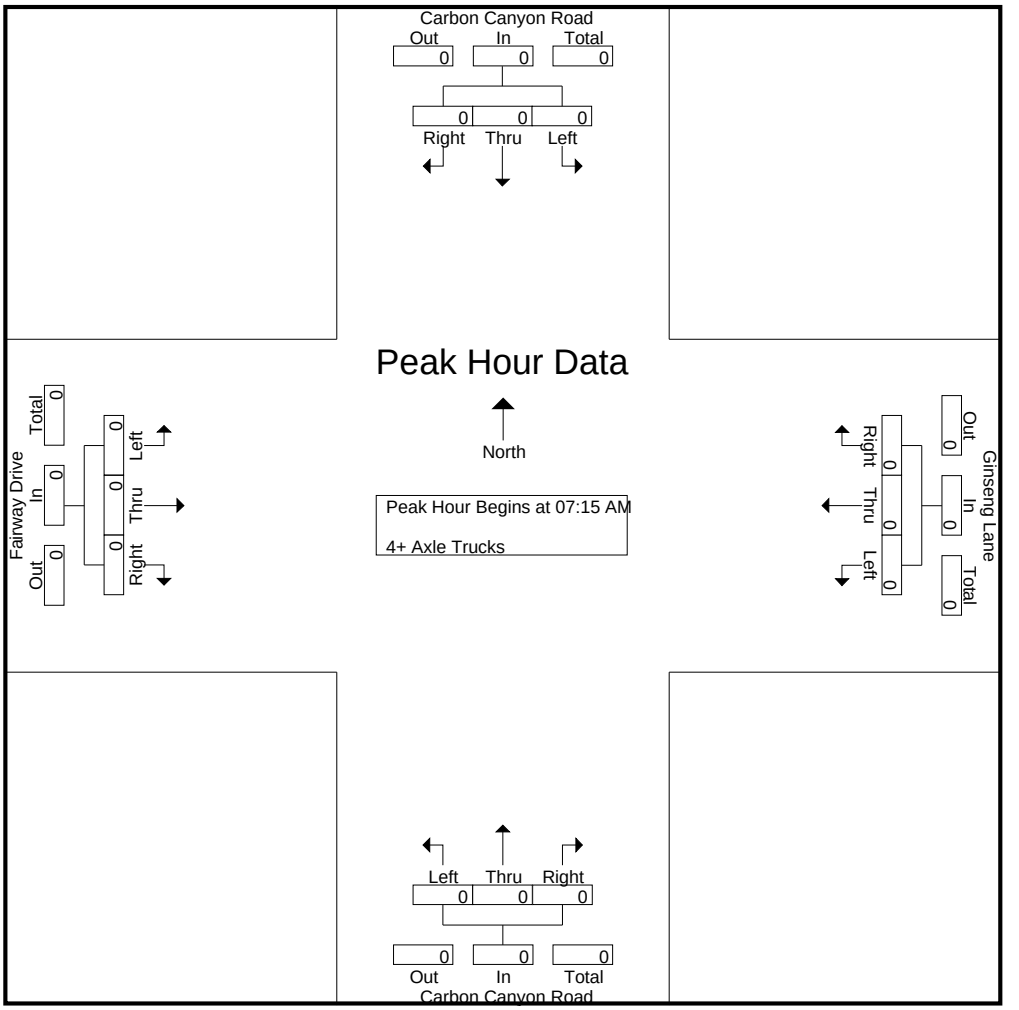
	Carbon Canyon Road Southbound				Ginseng Lane Westbound				Carbon Canyon Road Northbound				Fairway Drive Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Apprch %	0	0	0		0	0	0		0	0	0		0	0	0		
Total %																	

	Carbon Canyon Road Southbound				Ginseng Lane Westbound				Carbon Canyon Road Northbound				Fairway Drive Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0		0	0	0		0	0	0		0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268

City of Chino Hills
N/S: Carbon Canyon Road
E/W: Fairway Drive / Ginseng Lane
Weather: Clear

File Name : 01_CHHCCFAAM
Site Code : 05723534
Start Date : 5/23/2023
Page No : 2



Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:15 AM				07:15 AM				07:15 AM				07:15 AM			
+0 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0		0	0	0		0	0	0		0	0	0	
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268

City of Chino Hills
N/S: Carbon Canyon Road
E/W: Fairway Drive / Ginseng Lane
Weather: Clear

File Name : 01_CHHCCFAPM
Site Code : 05723534
Start Date : 5/23/2023
Page No : 1

Groups Printed- Passenger Vehicles - Large 2 Axle Vehicles - 3 Axle Vehicles - 4+ Axle Trucks

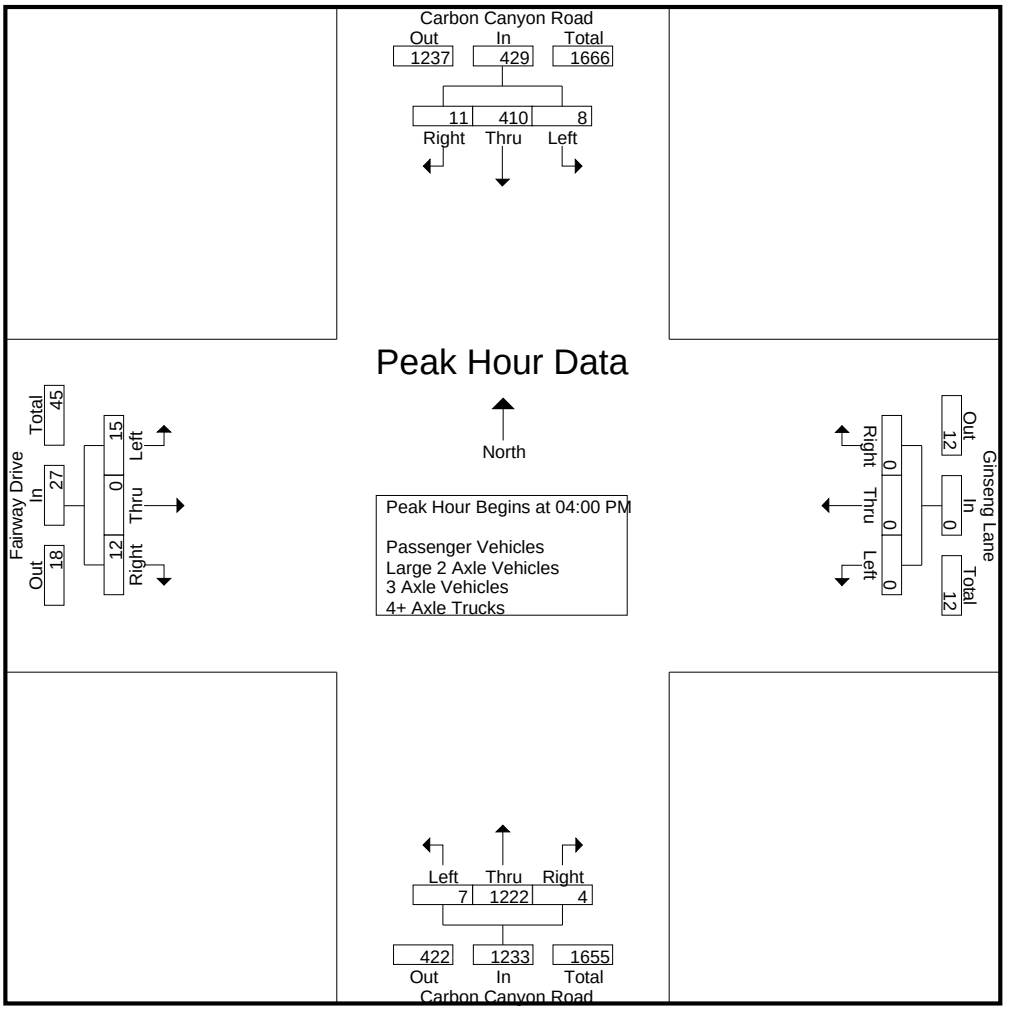
	Carbon Canyon Road Southbound				Ginseng Lane Westbound				Carbon Canyon Road Northbound				Fairway Drive Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	3	112	2	117	0	0	0	0	2	287	2	291	6	0	5	11	419
04:15 PM	0	101	2	103	0	0	0	0	2	322	1	325	2	0	3	5	433
04:30 PM	2	98	3	103	0	0	0	0	1	306	0	307	7	0	2	9	419
04:45 PM	3	99	4	106	0	0	0	0	2	307	1	310	0	0	2	2	418
Total	8	410	11	429	0	0	0	0	7	1222	4	1233	15	0	12	27	1689
05:00 PM	2	75	1	78	0	0	0	0	1	329	0	330	3	0	1	4	412
05:15 PM	0	103	2	105	0	0	0	0	0	299	0	299	4	0	3	7	411
05:30 PM	1	115	4	120	0	0	0	0	0	308	1	309	3	0	2	5	434
05:45 PM	2	85	4	91	0	0	0	0	1	288	0	289	3	0	3	6	386
Total	5	378	11	394	0	0	0	0	2	1224	1	1227	13	0	9	22	1643
Grand Total	13	788	22	823	0	0	0	0	9	2446	5	2460	28	0	21	49	3332
Apprch %	1.6	95.7	2.7		0	0	0		0.4	99.4	0.2		57.1	0	42.9		
Total %	0.4	23.6	0.7	24.7	0	0	0	0	0.3	73.4	0.2	73.8	0.8	0	0.6	1.5	
Passenger Vehicles	13	784	21	818	0	0	0	0	8	2440	5	2453	27	0	21	48	3319
% Passenger Vehicles	100	99.5	95.5	99.4	0	0	0	0	88.9	99.8	100	99.7	96.4	0	100	98	99.6
Large 2 Axle Vehicles	0	3	1	4	0	0	0	0	1	5	0	6	1	0	0	1	11
% Large 2 Axle Vehicles	0	0.4	4.5	0.5	0	0	0	0	11.1	0.2	0	0.2	3.6	0	0	2	0.3
3 Axle Vehicles	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
% 3 Axle Vehicles	0	0.1	0	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0
4+ Axle Trucks	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1
% 4+ Axle Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

	Carbon Canyon Road Southbound				Ginseng Lane Westbound				Carbon Canyon Road Northbound				Fairway Drive Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	**3**	**112**	2	**117**	0	0	0	0	**2**	287	**2**	291	6	0	**5**	**11**	419
04:15 PM	0	101	2	103	0	0	0	0	2	**322**	1	**325**	2	0	3	5	**433**
04:30 PM	2	98	3	103	0	0	0	0	1	306	0	307	**7**	0	2	9	419
04:45 PM	3	99	**4**	106	0	0	0	0	2	307	1	310	0	0	2	2	418
Total Volume	8	410	11	429	0	0	0	0	7	1222	4	1233	15	0	12	27	1689
% App. Total	1.9	95.6	2.6		0	0	0		0.6	99.1	0.3		55.6	0	44.4		
PHF	.667	.915	.688	.917	.000	.000	.000	.000	.875	.949	.500	.948	.536	.000	.600	.614	.975

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268

City of Chino Hills
N/S: Carbon Canyon Road
E/W: Fairway Drive / Ginseng Lane
Weather: Clear

File Name : 01_CHHCCFAPM
Site Code : 05723534
Start Date : 5/23/2023
Page No : 2



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:00 PM				04:00 PM				04:15 PM				04:00 PM			
+0 mins.	**3**	**112**	2	**117**	0	0	0	0	**2**	322	**1**	325	6	0	**5**	**11**
+15 mins.	0	101	2	103	0	0	0	0	1	306	0	307	2	0	3	5
+30 mins.	2	98	3	103	0	0	0	0	2	307	1	310	**7**	0	2	9
+45 mins.	3	99	**4**	106	0	0	0	0	1	**329**	0	**330**	0	0	2	2
Total Volume	8	410	11	429	0	0	0	0	6	1264	2	1272	15	0	12	27
% App. Total	1.9	95.6	2.6		0	0	0		0.5	99.4	0.2		55.6	0	44.4	
PHF	.667	.915	.688	.917	.000	.000	.000	.000	.750	.960	.500	.964	.536	.000	.600	.614

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268

City of Chino Hills
N/S: Carbon Canyon Road
E/W: Fairway Drive / Ginseng Lane
Weather: Clear

File Name : 01_CHHCCFAPM
Site Code : 05723534
Start Date : 5/23/2023
Page No : 1

Groups Printed- Passenger Vehicles

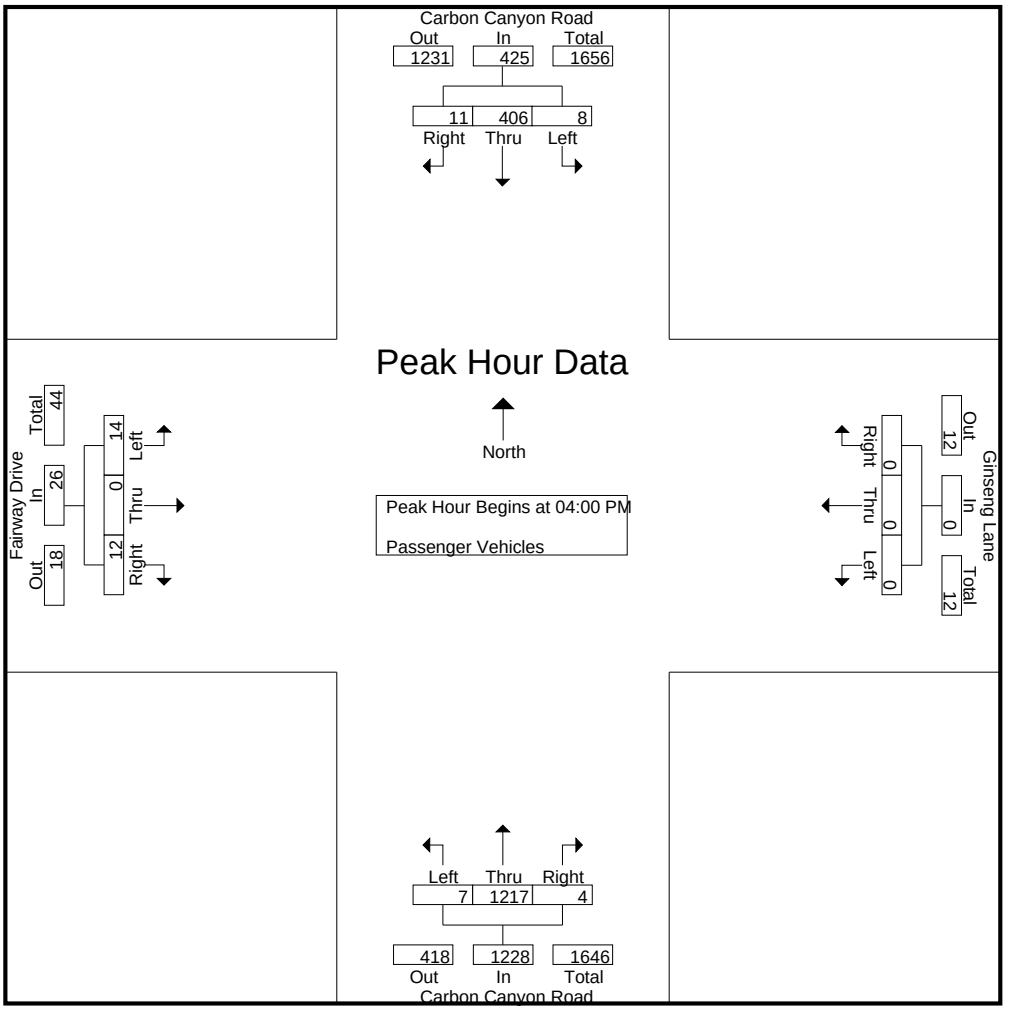
	Carbon Canyon Road Southbound				Ginseng Lane Westbound				Carbon Canyon Road Northbound				Fairway Drive Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	3	111	2	116	0	0	0	0	2	286	2	290	5	0	5	10	416
04:15 PM	0	99	2	101	0	0	0	0	2	321	1	324	2	0	3	5	430
04:30 PM	2	98	3	103	0	0	0	0	1	304	0	305	7	0	2	9	417
04:45 PM	3	98	4	105	0	0	0	0	2	306	1	309	0	0	2	2	416
Total	8	406	11	425	0	0	0	0	7	1217	4	1228	14	0	12	26	1679
05:00 PM	2	75	1	78	0	0	0	0	1	329	0	330	3	0	1	4	412
05:15 PM	0	103	2	105	0	0	0	0	0	299	0	299	4	0	3	7	411
05:30 PM	1	115	3	119	0	0	0	0	0	307	1	308	3	0	2	5	432
05:45 PM	2	85	4	91	0	0	0	0	0	288	0	288	3	0	3	6	385
Total	5	378	10	393	0	0	0	0	1	1223	1	1225	13	0	9	22	1640
Grand Total	13	784	21	818	0	0	0	0	8	2440	5	2453	27	0	21	48	3319
Apprch %	1.6	95.8	2.6		0	0	0		0.3	99.5	0.2		56.2	0	43.8		
Total %	0.4	23.6	0.6	24.6	0	0	0	0	0.2	73.5	0.2	73.9	0.8	0	0.6	1.4	

	Carbon Canyon Road Southbound				Ginseng Lane Westbound				Carbon Canyon Road Northbound				Fairway Drive Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 04:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	**3**	**111**	2	**116**	0	0	0	0	**2**	286	**2**	290	5	0	**5**	**10**	416
04:15 PM	0	99	2	101	0	0	0	0	2	**321**	1	**324**	2	0	3	5	**430**
04:30 PM	2	98	3	103	0	0	0	0	1	304	0	305	**7**	0	2	9	417
04:45 PM	3	98	**4**	105	0	0	0	0	2	306	1	309	0	0	2	2	416
Total Volume	8	406	11	425	0	0	0	0	7	1217	4	1228	14	0	12	26	1679
% App. Total	1.9	95.5	2.6		0	0	0		0.6	99.1	0.3		53.8	0	46.2		
PHF	.667	.914	.688	.916	.000	.000	.000	.000	.875	.948	.500	.948	.500	.000	.600	.650	.976

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268

City of Chino Hills
N/S: Carbon Canyon Road
E/W: Fairway Drive / Ginseng Lane
Weather: Clear

File Name : 01_CHHCCFAPM
Site Code : 05723534
Start Date : 5/23/2023
Page No : 2



Peak Hour Analysis From 04:00 PM to 04:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:00 PM				04:00 PM				04:00 PM				04:00 PM			
+0 mins.	**3**	**111**	2	**116**	0	0	0	0	**2**	286	**2**	290	5	0	**5**	**10**
+15 mins.	0	99	2	101	0	0	0	0	2	**321**	1	**324**	2	0	3	5
+30 mins.	2	98	3	103	0	0	0	0	1	304	0	305	**7**	0	2	9
+45 mins.	3	98	**4**	105	0	0	0	0	2	306	1	309	0	0	2	2
Total Volume	8	406	11	425	0	0	0	0	7	1217	4	1228	14	0	12	26
% App. Total	1.9	95.5	2.6		0	0	0		0.6	99.1	0.3		53.8	0	46.2	
PHF	.667	.914	.688	.916	.000	.000	.000	.000	.875	.948	.500	.948	.500	.000	.600	.650

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268

City of Chino Hills
N/S: Carbon Canyon Road
E/W: Fairway Drive / Ginseng Lane
Weather: Clear

File Name : 01_CHHCCFAPM
Site Code : 05723534
Start Date : 5/23/2023

Groups Printed- Large 2 Axle Vehicles

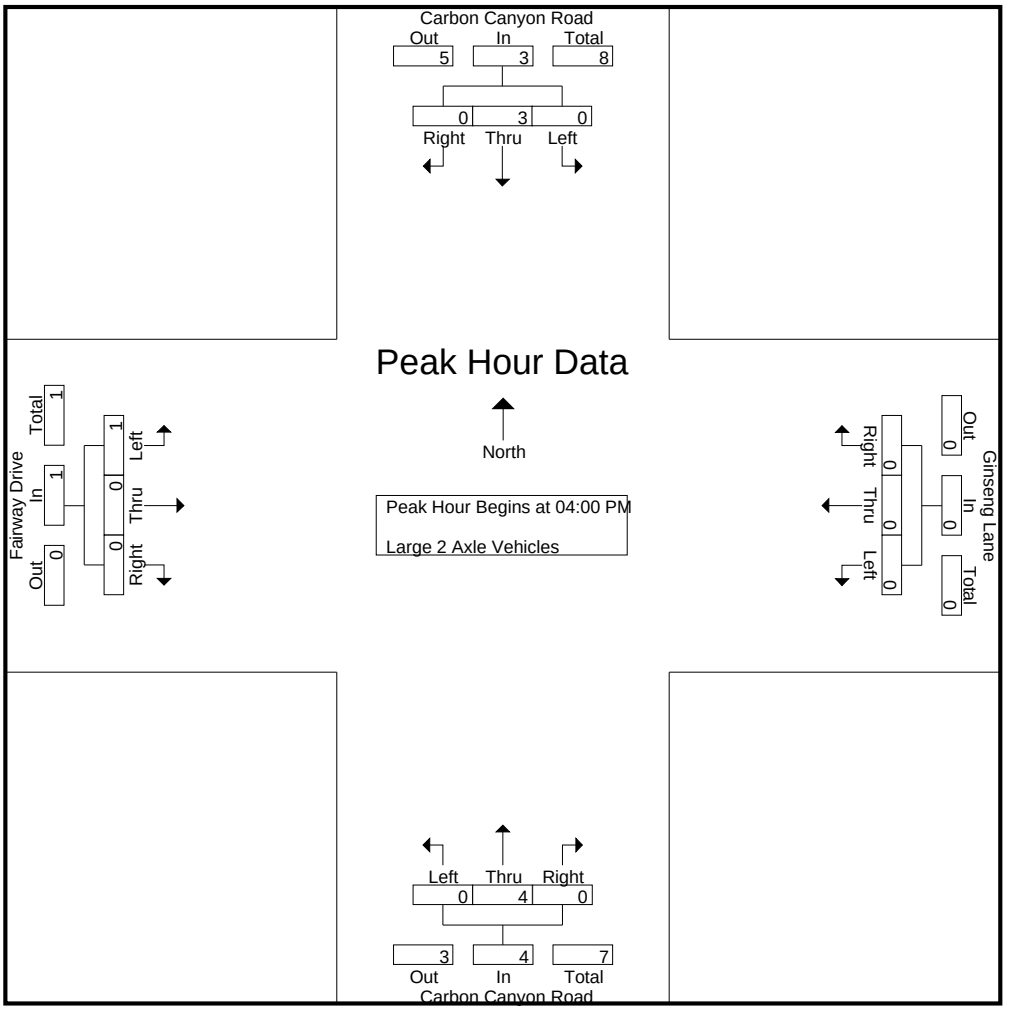
	Carbon Canyon Road Southbound				Ginseng Lane Westbound				Carbon Canyon Road Northbound				Fairway Drive Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	0	1	0	1	0	0	0	0	0	1	0	1	1	0	0	1	3
04:15 PM	0	1	0	1	0	0	0	0	0	1	0	1	0	0	0	0	2
04:30 PM	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1
04:45 PM	0	1	0	1	0	0	0	0	0	1	0	1	0	0	0	0	2
Total	0	3	0	3	0	0	0	0	0	4	0	4	1	0	0	1	8
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	1	1	0	0	0	0	0	1	0	1	0	0	0	0	2
05:45 PM	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	1
Total	0	0	1	1	0	0	0	0	1	1	0	2	0	0	0	0	3
Grand Total	0	3	1	4	0	0	0	0	1	5	0	6	1	0	0	1	11
Apprch %	0	75	25		0	0	0		16.7	83.3	0		100	0	0		
Total %	0	27.3	9.1	36.4	0	0	0	0	9.1	45.5	0	54.5	9.1	0	0	9.1	

	Carbon Canyon Road Southbound				Ginseng Lane Westbound				Carbon Canyon Road Northbound				Fairway Drive Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 04:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	0	**1**	0	**1**	0	0	0	0	0	**1**	0	**1**	**1**	0	0	**1**	**3**
04:15 PM	0	1	0	1	0	0	0	0	0	1	0	1	0	0	0	0	2
04:30 PM	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1
04:45 PM	0	1	0	1	0	0	0	0	0	1	0	1	0	0	0	0	2
Total Volume	0	3	0	3	0	0	0	0	0	4	0	4	1	0	0	1	8
% App. Total	0	100	0		0	0	0		0	100	0		100	0	0		
PHF	.000	.750	.000	.750	.000	.000	.000	.000	.000	1.00	.000	1.00	.250	.000	.000	.250	.667

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268

City of Chino Hills
N/S: Carbon Canyon Road
E/W: Fairway Drive / Ginseng Lane
Weather: Clear

File Name : 01_CHHCCFAPM
Site Code : 05723534
Start Date : 5/23/2023
Page No : 2



Peak Hour Analysis From 04:00 PM to 04:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:00 PM				04:00 PM				04:00 PM				04:00 PM			
+0 mins.	0	**1**	0	**1**	0	0	0	0	0	**1**	0	**1**	**1**	0	0	**1**
+15 mins.	0	1	0	1	0	0	0	0	0	1	0	1	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0
+45 mins.	0	1	0	1	0	0	0	0	0	1	0	1	0	0	0	0
Total Volume	0	3	0	3	0	0	0	0	0	4	0	4	1	0	0	1
% App. Total	0	100	0		0	0	0		0	100	0		100	0	0	
PHF	.000	.750	.000	.750	.000	.000	.000	.000	.000	1.000	.000	1.000	.250	.000	.000	.250

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268

City of Chino Hills
N/S: Carbon Canyon Road
E/W: Fairway Drive / Ginseng Lane
Weather: Clear

File Name : 01_CHHCCFAPM
Site Code : 05723534
Start Date : 5/23/2023
Page No : 1

Groups Printed- 3 Axle Vehicles

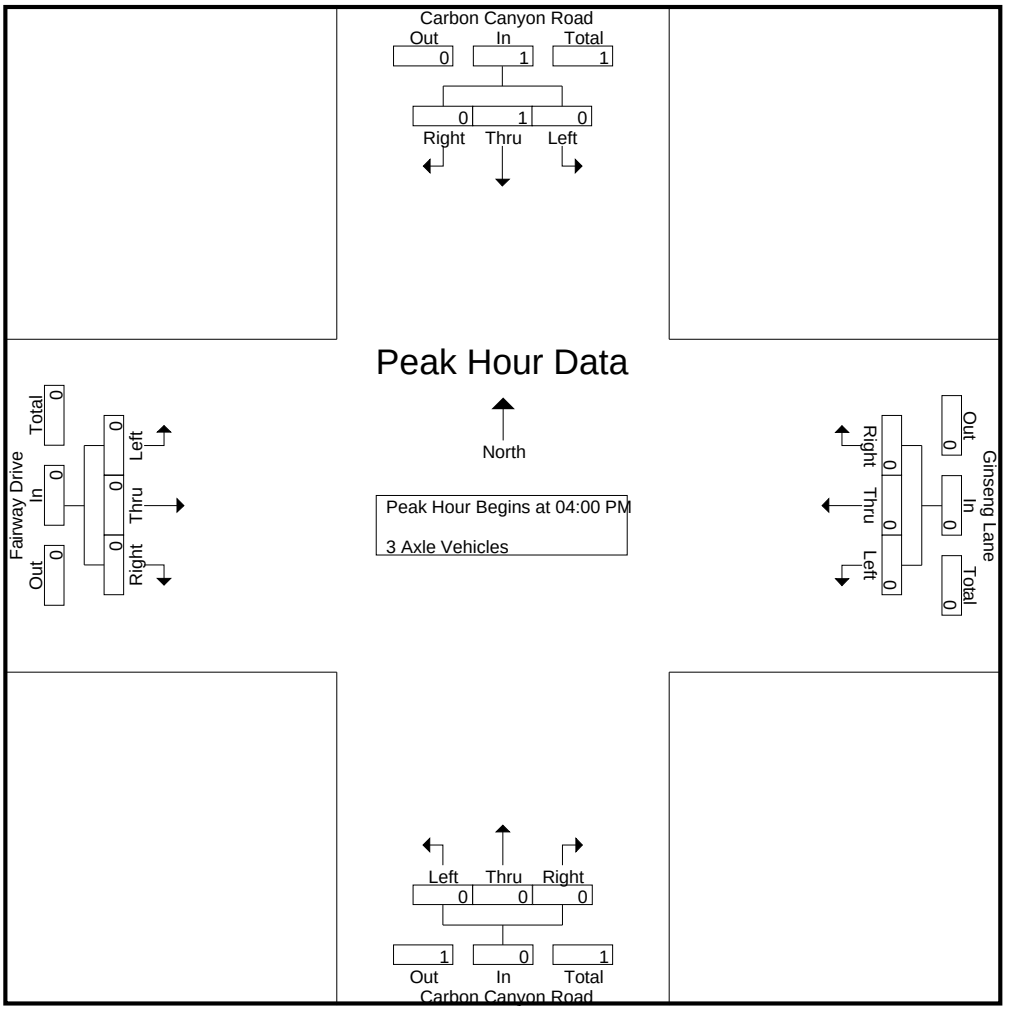
	Carbon Canyon Road Southbound				Ginseng Lane Westbound				Carbon Canyon Road Northbound				Fairway Drive Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Apprch %	0	100	0		0	0	0		0	0	0		0	0	0		
Total %	0	100	0	100	0	0	0	0	0	0	0	0	0	0	0	0	

	Carbon Canyon Road Southbound				Ginseng Lane Westbound				Carbon Canyon Road Northbound				Fairway Drive Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 04:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	**1**	0	**1**	0	0	0	0	0	0	0	0	0	0	0	0	**1**
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
% App. Total	0	100	0		0	0	0		0	0	0		0	0	0		
PHF	.000	.250	.000	.250	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.250

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268

City of Chino Hills
N/S: Carbon Canyon Road
E/W: Fairway Drive / Ginseng Lane
Weather: Clear

File Name : 01_CHHCCFAPM
Site Code : 05723534
Start Date : 5/23/2023
Page No : 2



Peak Hour Analysis From 04:00 PM to 04:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:00 PM				04:00 PM				04:00 PM				04:00 PM			
+0 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+15 mins.	0	**1**	0	**1**	0	0	0	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	100	0		0	0	0		0	0	0		0	0	0	
PHF	.000	.250	.000	.250	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268

City of Chino Hills
N/S: Carbon Canyon Road
E/W: Fairway Drive / Ginseng Lane
Weather: Clear

File Name : 01_CHHCCFAPM
Site Code : 05723534
Start Date : 5/23/2023
Page No : 1

Groups Printed- 4+ Axle Trucks

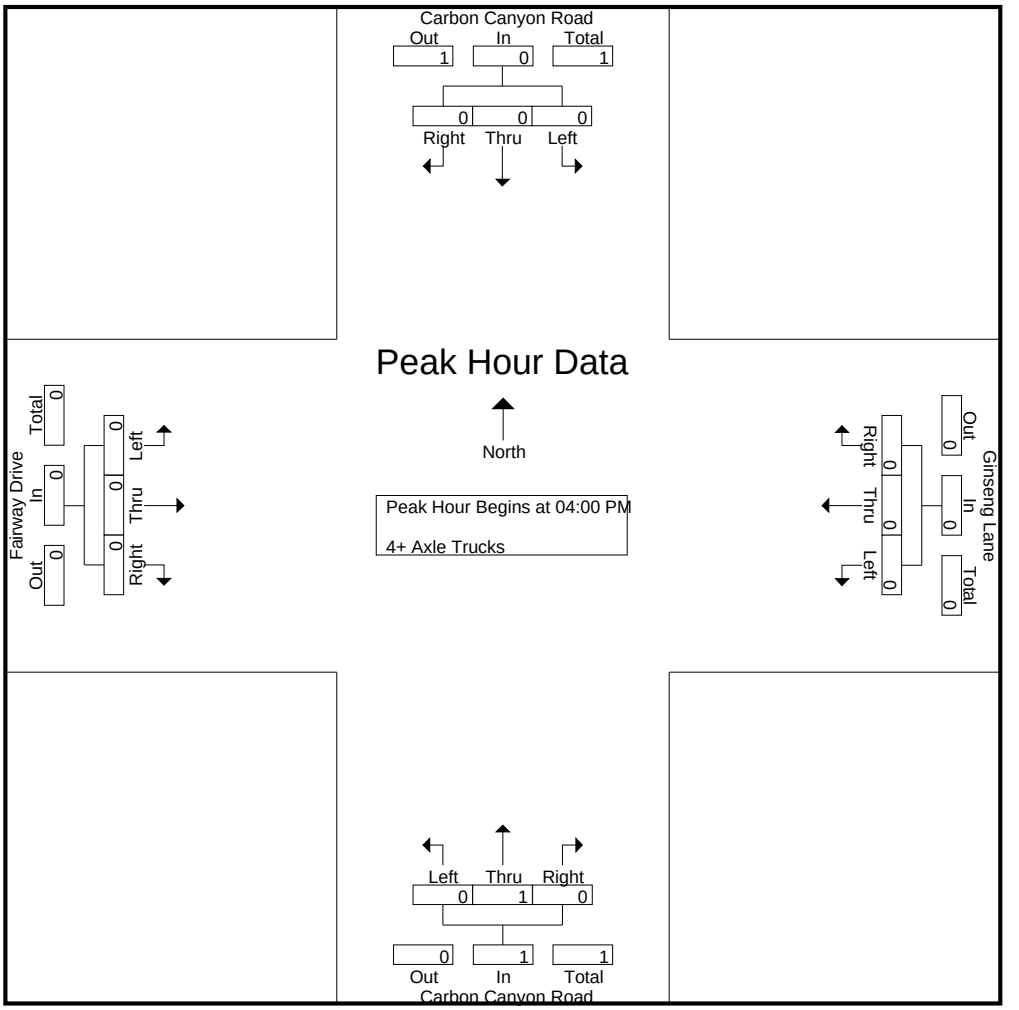
	Carbon Canyon Road Southbound				Ginseng Lane Westbound				Carbon Canyon Road Northbound				Fairway Drive Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1
Apprch %	0	0	0		0	0	0		0	100	0		0	0	0		
Total %	0	0	0	0	0	0	0	0	0	100	0	100	0	0	0	0	

	Carbon Canyon Road Southbound				Ginseng Lane Westbound				Carbon Canyon Road Northbound				Fairway Drive Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 04:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	**1**	0	**1**	0	0	0	0	**1**
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1
% App. Total	0	0	0		0	0	0		0	100	0		0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.250	.000	.250	.000	.000	.000	.000	.250

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268

City of Chino Hills
N/S: Carbon Canyon Road
E/W: Fairway Drive / Ginseng Lane
Weather: Clear

File Name : 01_CHHCCFAPM
Site Code : 05723534
Start Date : 5/23/2023
Page No : 2



Peak Hour Analysis From 04:00 PM to 04:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:00 PM				04:00 PM				04:00 PM				04:00 PM			
+0 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0	**1**	0	**1**	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0
% App. Total	0	0	0		0	0	0		0	100	0		0	0	0	
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.250	.000	.250	.000	.000	.000	.000

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268

City of Chino Hills
N/S: Carbon Canyon Road
E/W: Canyon Hills Road
Weather: Clear

File Name : 02_CHHCCCHAM
Site Code : 05723534
Start Date : 5/23/2023
Page No : 1

Groups Printed- Passenger Vehicles - Large 2 Axle Vehicles - 3 Axle Vehicles - 4+ Axle Trucks

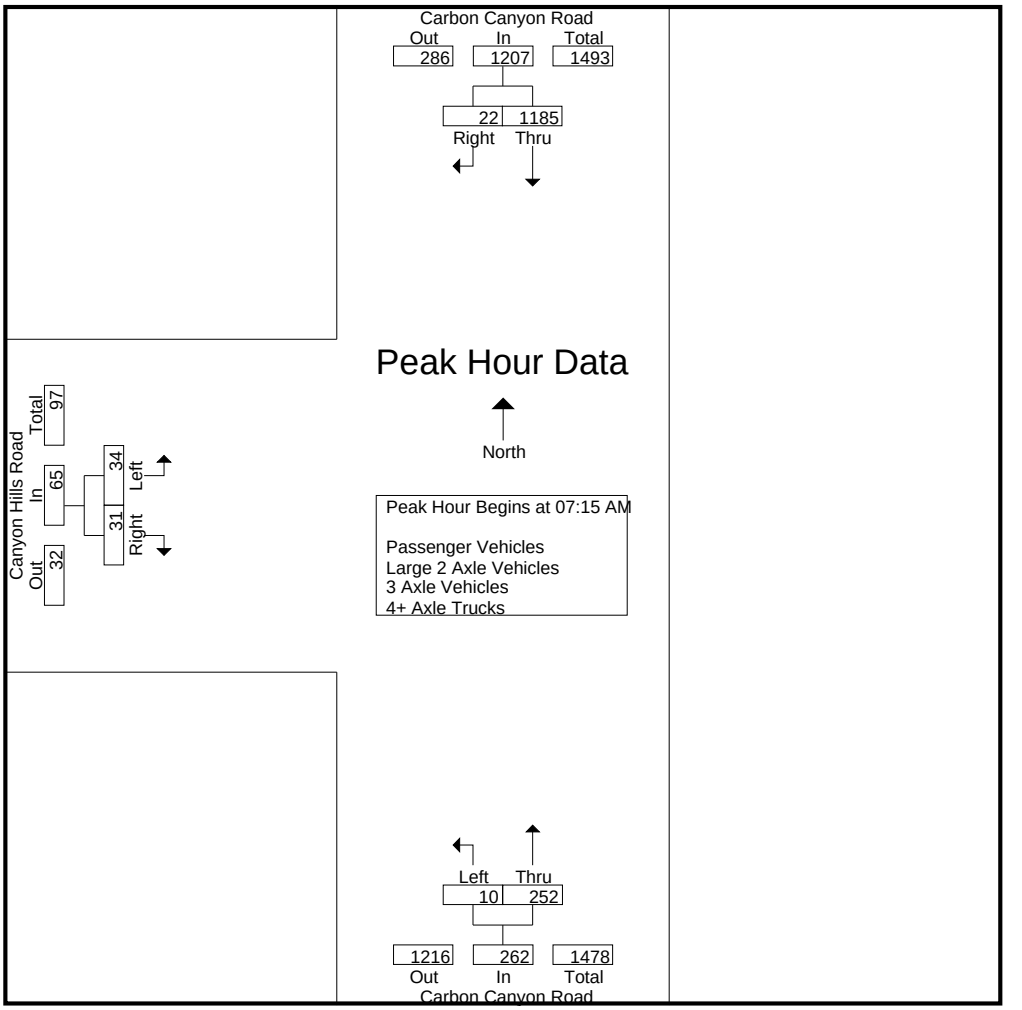
	Carbon Canyon Road Southbound			Carbon Canyon Road Northbound			Canyon Hills Road Eastbound			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
07:00 AM	323	5	328	0	26	26	8	4	12	366
07:15 AM	321	6	327	0	37	37	7	13	20	384
07:30 AM	304	5	309	1	72	73	9	8	17	399
07:45 AM	282	5	287	7	73	80	5	4	9	376
Total	1230	21	1251	8	208	216	29	29	58	1525
08:00 AM	278	6	284	2	70	72	13	6	19	375
08:15 AM	247	3	250	2	46	48	6	7	13	311
08:30 AM	241	8	249	3	55	58	6	3	9	316
08:45 AM	196	3	199	3	63	66	4	1	5	270
Total	962	20	982	10	234	244	29	17	46	1272
Grand Total	2192	41	2233	18	442	460	58	46	104	2797
Apprch %	98.2	1.8		3.9	96.1		55.8	44.2		
Total %	78.4	1.5	79.8	0.6	15.8	16.4	2.1	1.6	3.7	
Passenger Vehicles	2180	41	2221	16	436	452	58	45	103	2776
% Passenger Vehicles	99.5	100	99.5	88.9	98.6	98.3	100	97.8	99	99.2
Large 2 Axle Vehicles	12	0	12	1	6	7	0	1	1	20
% Large 2 Axle Vehicles	0.5	0	0.5	5.6	1.4	1.5	0	2.2	1	0.7
3 Axle Vehicles	0	0	0	1	0	1	0	0	0	1
% 3 Axle Vehicles	0	0	0	5.6	0	0.2	0	0	0	0
4+ Axle Trucks	0	0	0	0	0	0	0	0	0	0
% 4+ Axle Trucks	0	0	0	0	0	0	0	0	0	0

	Carbon Canyon Road Southbound			Carbon Canyon Road Northbound			Canyon Hills Road Eastbound			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:15 AM										
07:15 AM	**321**	**6**	**327**	0	37	37	7	**13**	**20**	384
07:30 AM	304	5	309	1	72	73	9	8	17	**399**
07:45 AM	282	5	287	**7**	**73**	**80**	5	4	9	376
08:00 AM	278	6	284	2	70	72	**13**	6	19	375
Total Volume	1185	22	1207	10	252	262	34	31	65	1534
% App. Total	98.2	1.8		3.8	96.2		52.3	47.7		
PHF	.923	.917	.923	.357	.863	.819	.654	.596	.813	.961

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268

City of Chino Hills
N/S: Carbon Canyon Road
E/W: Canyon Hills Road
Weather: Clear

File Name : 02_CHHCCCHAM
Site Code : 05723534
Start Date : 5/23/2023
Page No : 2



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:00 AM			07:30 AM			07:15 AM		
+0 mins.	**323**	5	**328**	1	72	73	7	**13**	**20**
+15 mins.	321	**6**	327	**7**	**73**	**80**	9	8	17
+30 mins.	304	5	309	2	70	72	5	4	9
+45 mins.	282	5	287	2	46	48	**13**	6	19
Total Volume	1230	21	1251	12	261	273	34	31	65
% App. Total	98.3	1.7		4.4	95.6		52.3	47.7	
PHF	.952	.875	.954	.429	.894	.853	.654	.596	.813

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268

City of Chino Hills
N/S: Carbon Canyon Road
E/W: Canyon Hills Road
Weather: Clear

File Name : 02_CHHCCCHAM
Site Code : 05723534
Start Date : 5/23/2023
Page No : 1

Groups Printed- Passenger Vehicles

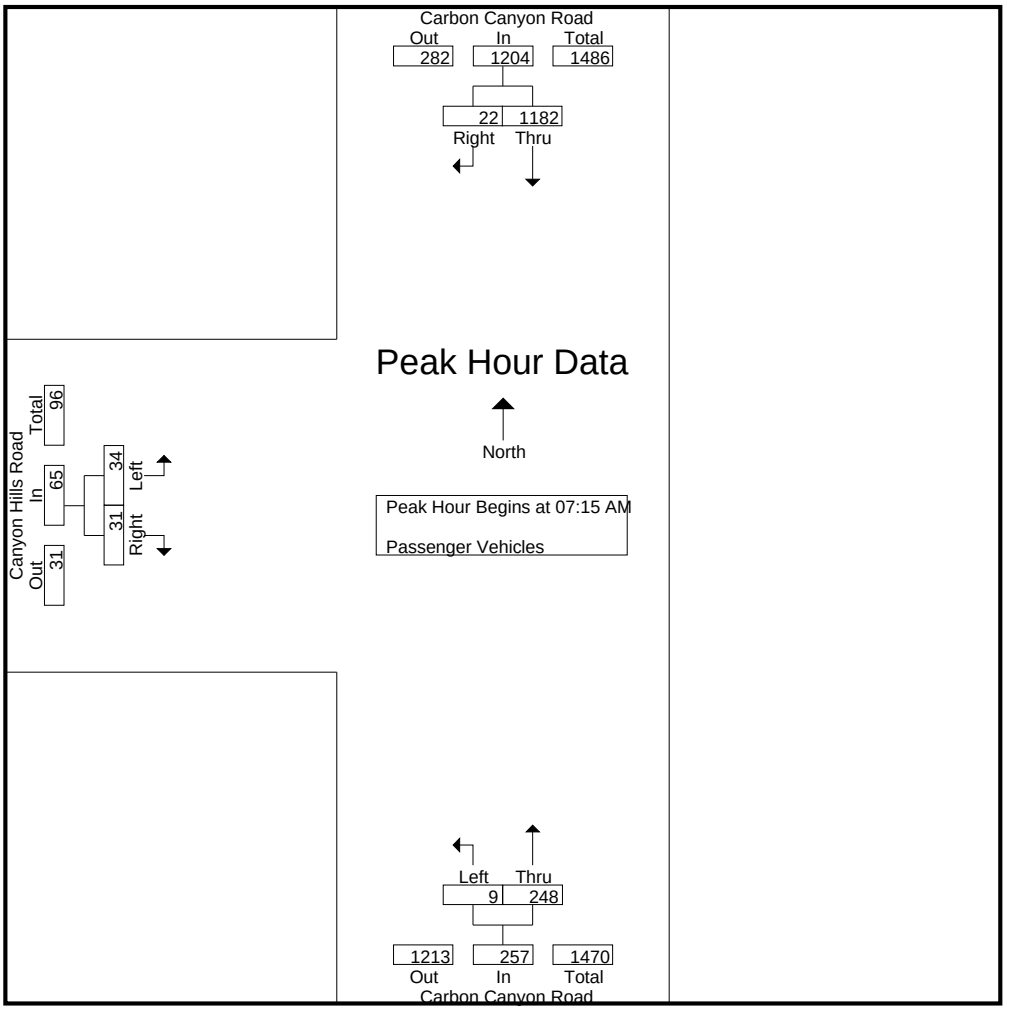
	Carbon Canyon Road Southbound			Carbon Canyon Road Northbound			Canyon Hills Road Eastbound			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
07:00 AM	320	5	325	0	25	25	8	4	12	362
07:15 AM	320	6	326	0	36	36	7	13	20	382
07:30 AM	303	5	308	1	71	72	9	8	17	397
07:45 AM	281	5	286	6	72	78	5	4	9	373
Total	1224	21	1245	7	204	211	29	29	58	1514
08:00 AM	278	6	284	2	69	71	13	6	19	374
08:15 AM	244	3	247	2	45	47	6	6	12	306
08:30 AM	240	8	248	3	55	58	6	3	9	315
08:45 AM	194	3	197	2	63	65	4	1	5	267
Total	956	20	976	9	232	241	29	16	45	1262
Grand Total	2180	41	2221	16	436	452	58	45	103	2776
Apprch %	98.2	1.8		3.5	96.5		56.3	43.7		
Total %	78.5	1.5	80	0.6	15.7	16.3	2.1	1.6	3.7	

	Carbon Canyon Road Southbound			Carbon Canyon Road Northbound			Canyon Hills Road Eastbound			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:15 AM										
07:15 AM	**320**	**6**	**326**	0	36	36	7	**13**	**20**	382
07:30 AM	303	5	308	1	71	72	9	8	17	**397**
07:45 AM	281	5	286	**6**	**72**	**78**	5	4	9	373
08:00 AM	278	6	284	2	69	71	**13**	6	19	374
Total Volume	1182	22	1204	9	248	257	34	31	65	1526
% App. Total	98.2	1.8		3.5	96.5		52.3	47.7		
PHF	.923	.917	.923	.375	.861	.824	.654	.596	.813	.961

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268

City of Chino Hills
N/S: Carbon Canyon Road
E/W: Canyon Hills Road
Weather: Clear

File Name : 02_CHHCCCHAM
Site Code : 05723534
Start Date : 5/23/2023
Page No : 2



Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:15 AM			07:15 AM			07:15 AM		
+0 mins.	**320**	**6**	**326**	0	36	36	7	**13**	**20**
+15 mins.	303	5	308	1	71	72	9	8	17
+30 mins.	281	5	286	**6**	**72**	**78**	5	4	9
+45 mins.	278	6	284	2	69	71	**13**	6	19
Total Volume	1182	22	1204	9	248	257	34	31	65
% App. Total	98.2	1.8		3.5	96.5		52.3	47.7	
PHF	.923	.917	.923	.375	.861	.824	.654	.596	.813

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268

City of Chino Hills
N/S: Carbon Canyon Road
E/W: Canyon Hills Road
Weather: Clear

File Name : 02_CHHCCCHAM
Site Code : 05723534
Start Date : 5/23/2023
Page No : 1

Groups Printed- Large 2 Axle Vehicles

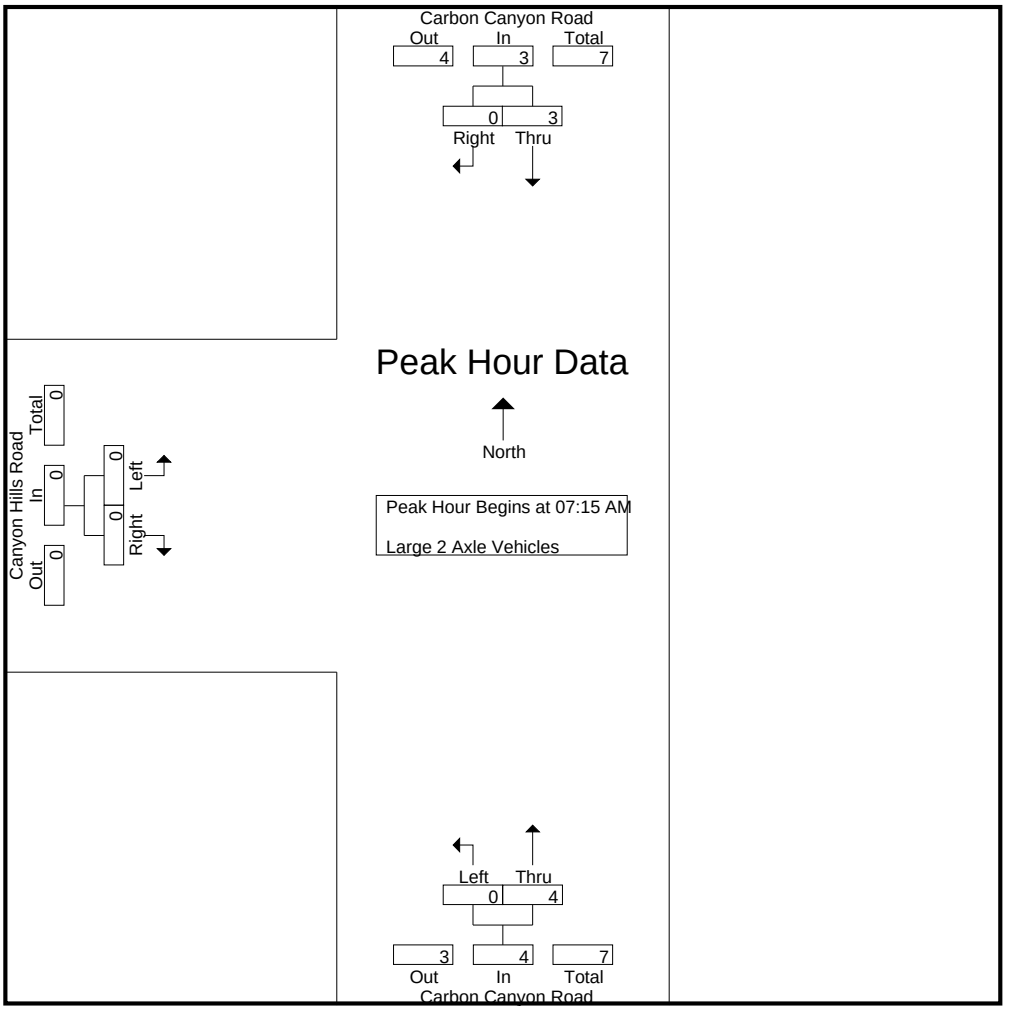
	Carbon Canyon Road Southbound			Carbon Canyon Road Northbound			Canyon Hills Road Eastbound			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
07:00 AM	3	0	3	0	1	1	0	0	0	4
07:15 AM	1	0	1	0	1	1	0	0	0	2
07:30 AM	1	0	1	0	1	1	0	0	0	2
07:45 AM	1	0	1	0	1	1	0	0	0	2
Total	6	0	6	0	4	4	0	0	0	10
08:00 AM	0	0	0	0	1	1	0	0	0	1
08:15 AM	3	0	3	0	1	1	0	1	1	5
08:30 AM	1	0	1	0	0	0	0	0	0	1
08:45 AM	2	0	2	1	0	1	0	0	0	3
Total	6	0	6	1	2	3	0	1	1	10
Grand Total	12	0	12	1	6	7	0	1	1	20
Apprch %	100	0		14.3	85.7		0	100		
Total %	60	0	60	5	30	35	0	5	5	

	Carbon Canyon Road Southbound			Carbon Canyon Road Northbound			Canyon Hills Road Eastbound			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:15 AM										
07:15 AM	**1**	0	**1**	0	**1**	**1**	0	0	0	**2**
07:30 AM	1	0	1	0	1	1	0	0	0	2
07:45 AM	1	0	1	0	1	1	0	0	0	2
08:00 AM	0	0	0	0	1	1	0	0	0	1
Total Volume	3	0	3	0	4	4	0	0	0	7
% App. Total	100	0		0	100		0	0		
PHF	.750	.000	.750	.000	1.00	1.00	.000	.000	.000	.875

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268

City of Chino Hills
N/S: Carbon Canyon Road
E/W: Canyon Hills Road
Weather: Clear

File Name : 02_CHHCCCHAM
Site Code : 05723534
Start Date : 5/23/2023
Page No : 2



Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:15 AM			07:15 AM			07:15 AM		
+0 mins.	**1**	0	**1**	0	**1**	**1**	0	0	0
+15 mins.	1	0	1	0	1	1	0	0	0
+30 mins.	1	0	1	0	1	1	0	0	0
+45 mins.	0	0	0	0	1	1	0	0	0
Total Volume	3	0	3	0	4	4	0	0	0
% App. Total	100	0		0	100		0	0	
PHF	.750	.000	.750	.000	1.000	1.000	.000	.000	.000

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268

City of Chino Hills
N/S: Carbon Canyon Road
E/W: Canyon Hills Road
Weather: Clear

File Name : 02_CHHCCCHAM
Site Code : 05723534
Start Date : 5/23/2023
Page No : 1

Groups Printed- 3 Axle Vehicles

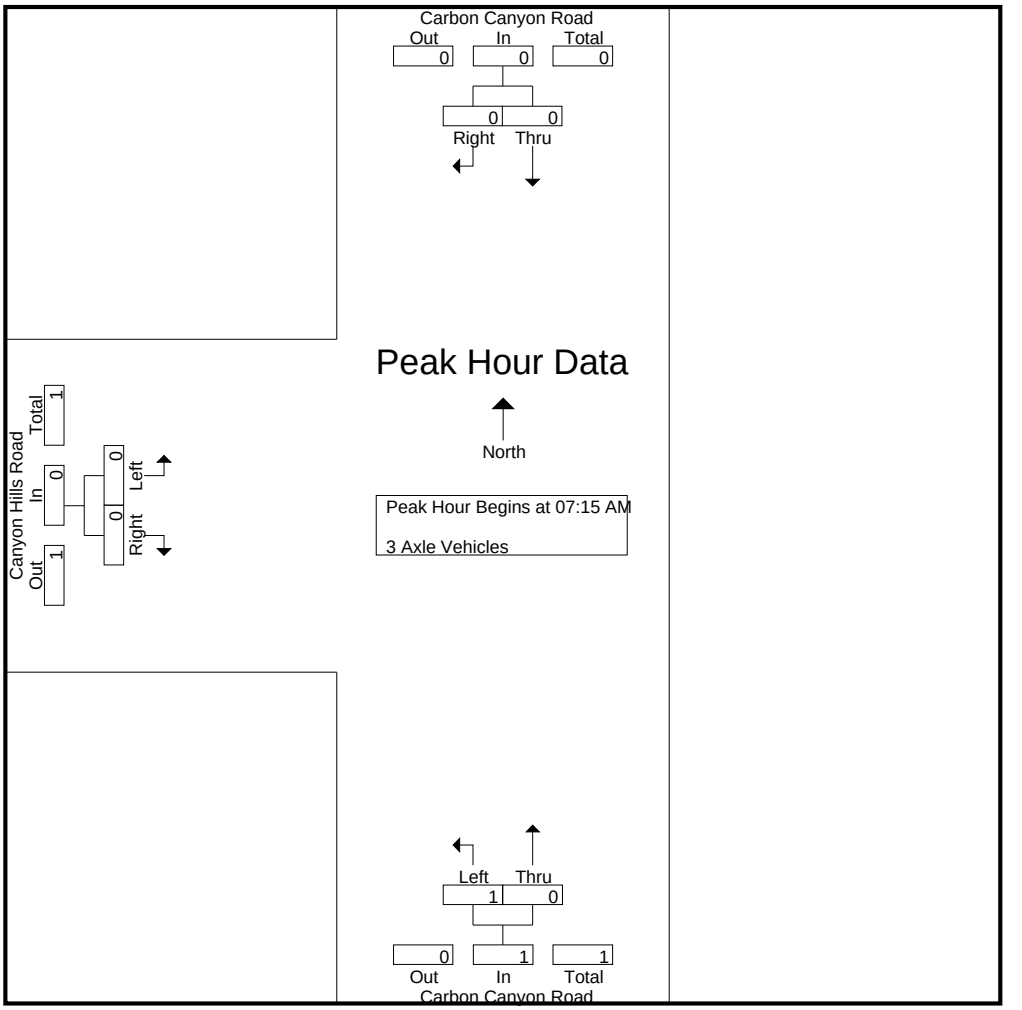
	Carbon Canyon Road Southbound			Carbon Canyon Road Northbound			Canyon Hills Road Eastbound			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	1	0	1	0	0	0	1
Total	0	0	0	1	0	1	0	0	0	1
08:00 AM	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	1	0	1	0	0	0	1
Apprch %	0	0		100	0		0	0		
Total %	0	0	0	100	0	100	0	0	0	

	Carbon Canyon Road Southbound			Carbon Canyon Road Northbound			Canyon Hills Road Eastbound			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:15 AM										
07:15 AM	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	**1**	0	**1**	0	0	0	**1**
08:00 AM	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	1	0	1	0	0	0	1
% App. Total	0	0		100	0		0	0		
PHF	.000	.000	.000	.250	.000	.250	.000	.000	.000	.250

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268

City of Chino Hills
N/S: Carbon Canyon Road
E/W: Canyon Hills Road
Weather: Clear

File Name : 02_CHHCCCHAM
Site Code : 05723534
Start Date : 5/23/2023
Page No : 2



Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:15 AM			07:15 AM			07:15 AM		
+0 mins.	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	**1**	0	**1**	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	1	0	1	0	0	0
% App. Total	0	0		100	0		0	0	
PHF	.000	.000	.000	.250	.000	.250	.000	.000	.000

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268

City of Chino Hills
N/S: Carbon Canyon Road
E/W: Canyon Hills Road
Weather: Clear

File Name : 02_CHHCCCHAM
Site Code : 05723534
Start Date : 5/23/2023
Page No : 1

Groups Printed- 4+ Axle Trucks

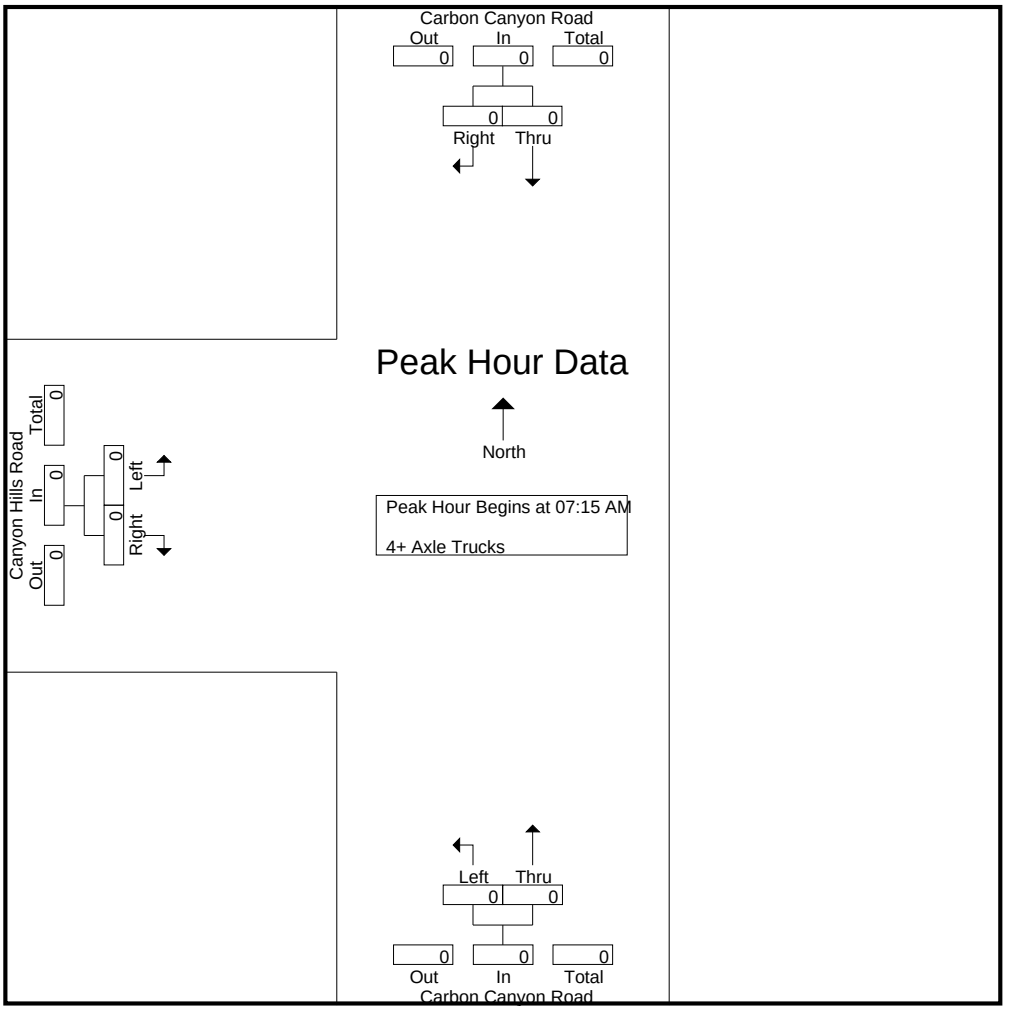
	Carbon Canyon Road Southbound			Carbon Canyon Road Northbound			Canyon Hills Road Eastbound			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0
08:00 AM	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0
Apprch %	0	0		0	0		0	0		
Total %										

	Carbon Canyon Road Southbound			Carbon Canyon Road Northbound			Canyon Hills Road Eastbound			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:15 AM										
07:15 AM	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0
08:00 AM	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0		0	0		0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268

City of Chino Hills
N/S: Carbon Canyon Road
E/W: Canyon Hills Road
Weather: Clear

File Name : 02_CHHCCCHAM
Site Code : 05723534
Start Date : 5/23/2023
Page No : 2



Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:15 AM			07:15 AM			07:15 AM		
+0 mins.	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0
% App. Total	0	0		0	0		0	0	
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268

City of Chino Hills
N/S: Carbon Canyon Road
E/W: Canyon Hills Road
Weather: Clear

File Name : 02_CHHCCCHPM
Site Code : 05723534
Start Date : 5/23/2023
Page No : 1

Groups Printed- Passenger Vehicles - Large 2 Axle Vehicles - 3 Axle Vehicles - 4+ Axle Trucks

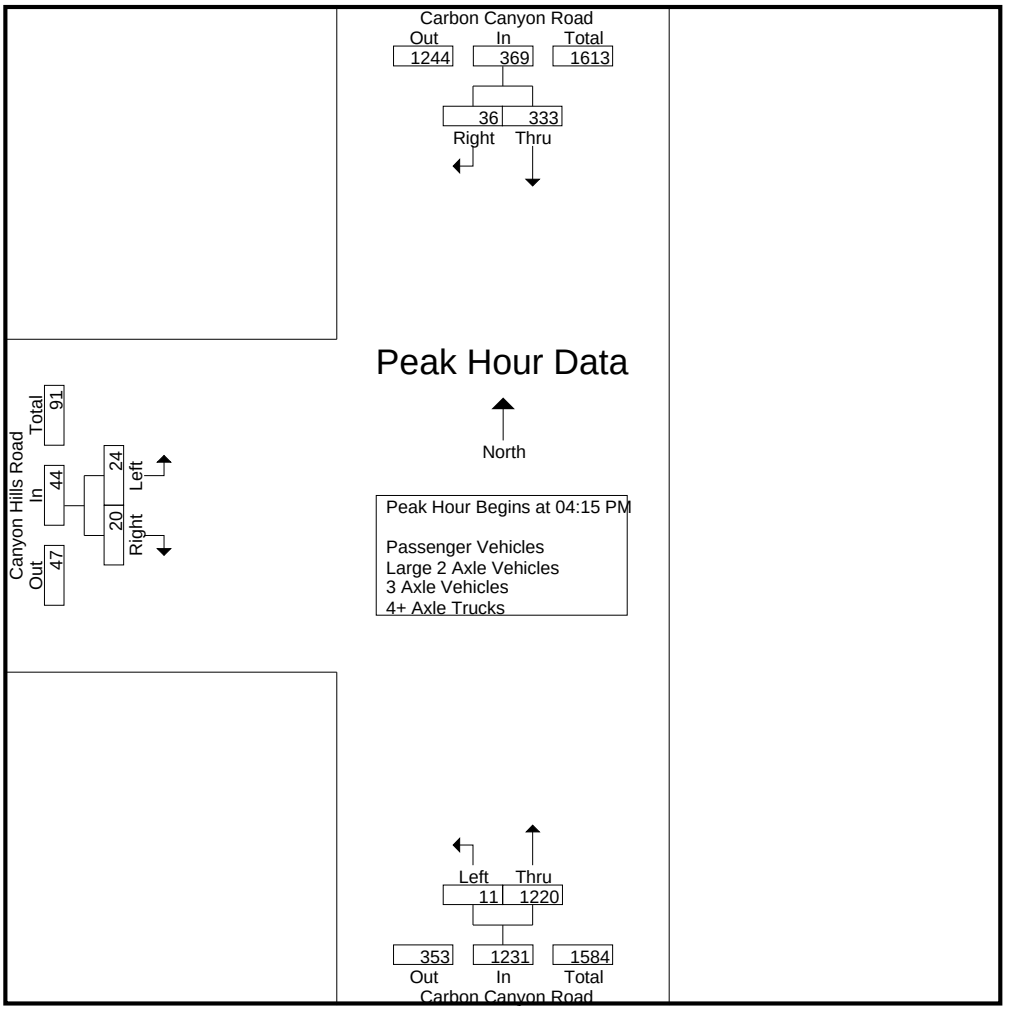
	Carbon Canyon Road Southbound			Carbon Canyon Road Northbound			Canyon Hills Road Eastbound			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
04:00 PM	77	11	88	6	273	279	9	4	13	380
04:15 PM	105	6	111	2	304	306	5	4	9	426
04:30 PM	78	12	90	4	298	302	7	1	8	400
04:45 PM	82	10	92	3	302	305	7	11	18	415
Total	342	39	381	15	1177	1192	28	20	48	1621
05:00 PM	68	8	76	2	316	318	5	4	9	403
05:15 PM	79	14	93	9	285	294	5	6	11	398
05:30 PM	85	12	97	7	304	311	7	5	12	420
05:45 PM	76	10	86	6	281	287	8	7	15	388
Total	308	44	352	24	1186	1210	25	22	47	1609
Grand Total	650	83	733	39	2363	2402	53	42	95	3230
Apprch %	88.7	11.3		1.6	98.4		55.8	44.2		
Total %	20.1	2.6	22.7	1.2	73.2	74.4	1.6	1.3	2.9	
Passenger Vehicles	645	83	728	39	2359	2398	53	42	95	3221
% Passenger Vehicles	99.2	100	99.3	100	99.8	99.8	100	100	100	99.7
Large 2 Axle Vehicles	5	0	5	0	3	3	0	0	0	8
% Large 2 Axle Vehicles	0.8	0	0.7	0	0.1	0.1	0	0	0	0.2
3 Axle Vehicles	0	0	0	0	0	0	0	0	0	0
% 3 Axle Vehicles	0	0	0	0	0	0	0	0	0	0
4+ Axle Trucks	0	0	0	0	1	1	0	0	0	1
% 4+ Axle Trucks	0	0	0	0	0	0	0	0	0	0

	Carbon Canyon Road Southbound			Carbon Canyon Road Northbound			Canyon Hills Road Eastbound			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:15 PM										
04:15 PM	**105**	6	**111**	2	304	306	5	4	9	**426**
04:30 PM	78	**12**	90	**4**	298	302	**7**	1	8	400
04:45 PM	82	10	92	3	302	305	7	**11**	**18**	415
05:00 PM	68	8	76	2	**316**	**318**	5	4	9	403
Total Volume	333	36	369	11	1220	1231	24	20	44	1644
% App. Total	90.2	9.8		0.9	99.1		54.5	45.5		
PHF	.793	.750	.831	.688	.965	.968	.857	.455	.611	.965

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268

City of Chino Hills
N/S: Carbon Canyon Road
E/W: Canyon Hills Road
Weather: Clear

File Name : 02_CHHCCCHPM
Site Code : 05723534
Start Date : 5/23/2023
Page No : 2



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:00 PM			04:15 PM			04:45 PM		
+0 mins.	77	11	88	2	304	306	**7**	**11**	**18**
+15 mins.	**105**	6	**111**	**4**	298	302	5	4	9
+30 mins.	78	**12**	90	3	302	305	5	6	11
+45 mins.	82	10	92	2	**316**	**318**	7	5	12
Total Volume	342	39	381	11	1220	1231	24	26	50
% App. Total	89.8	10.2		0.9	99.1		48	52	
PHF	.814	.813	.858	.688	.965	.968	.857	.591	.694

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268

City of Chino Hills
N/S: Carbon Canyon Road
E/W: Canyon Hills Road
Weather: Clear

File Name : 02_CHHCCCHPM
Site Code : 05723534
Start Date : 5/23/2023
Page No : 1

Groups Printed- Passenger Vehicles

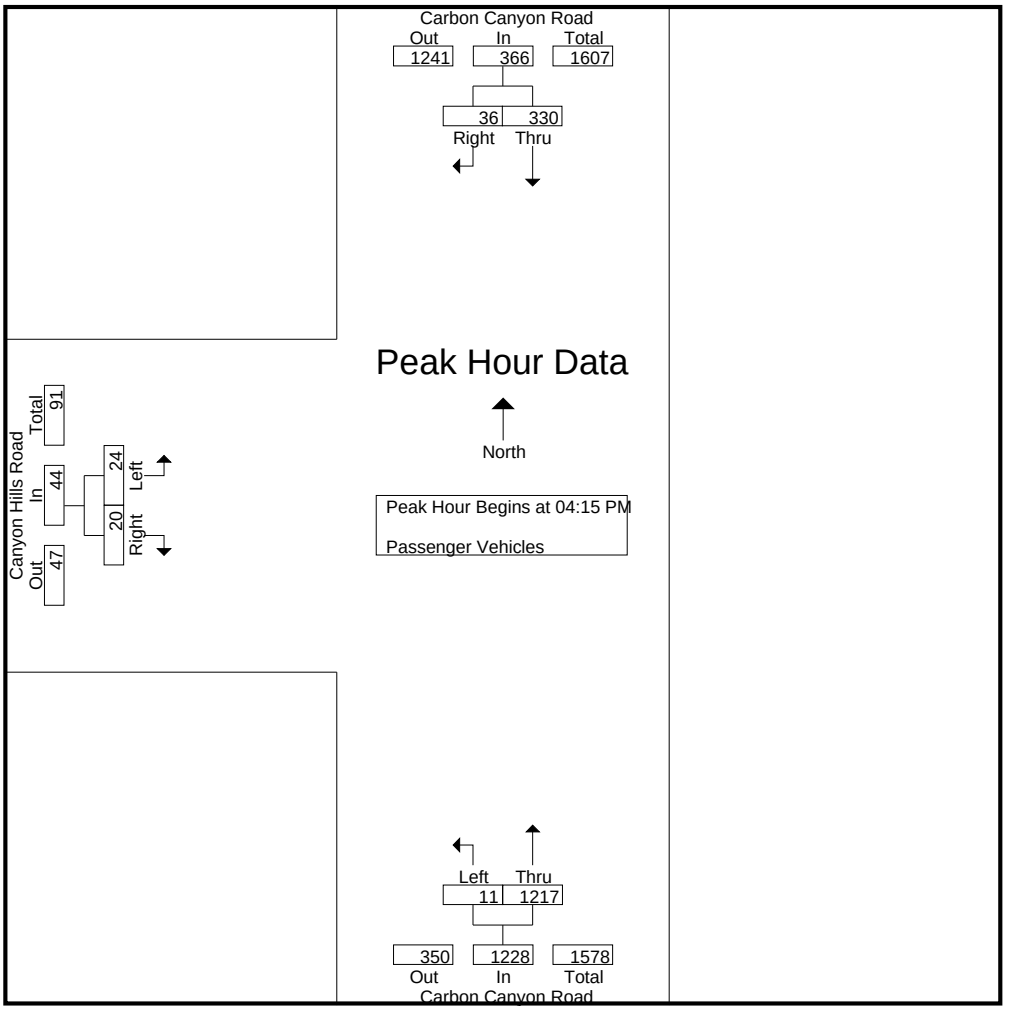
	Carbon Canyon Road Southbound			Carbon Canyon Road Northbound			Canyon Hills Road Eastbound			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
04:00 PM	76	11	87	6	272	278	9	4	13	378
04:15 PM	103	6	109	2	303	305	5	4	9	423
04:30 PM	78	12	90	4	297	301	7	1	8	399
04:45 PM	81	10	91	3	301	304	7	11	18	413
Total	338	39	377	15	1173	1188	28	20	48	1613
05:00 PM	68	8	76	2	316	318	5	4	9	403
05:15 PM	79	14	93	9	285	294	5	6	11	398
05:30 PM	85	12	97	7	304	311	7	5	12	420
05:45 PM	75	10	85	6	281	287	8	7	15	387
Total	307	44	351	24	1186	1210	25	22	47	1608
Grand Total	645	83	728	39	2359	2398	53	42	95	3221
Apprch %	88.6	11.4		1.6	98.4		55.8	44.2		
Total %	20	2.6	22.6	1.2	73.2	74.4	1.6	1.3	2.9	

	Carbon Canyon Road Southbound			Carbon Canyon Road Northbound			Canyon Hills Road Eastbound			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
Peak Hour Analysis From 04:15 PM to 05:00 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:15 PM										
04:15 PM	**103**	6	**109**	2	303	305	5	4	9	**423**
04:30 PM	78	**12**	90	**4**	297	301	**7**	1	8	399
04:45 PM	81	10	91	3	301	304	7	**11**	**18**	413
05:00 PM	68	8	76	2	**316**	**318**	5	4	9	403
Total Volume	330	36	366	11	1217	1228	24	20	44	1638
% App. Total	90.2	9.8		0.9	99.1		54.5	45.5		
PHF	.801	.750	.839	.688	.963	.965	.857	.455	.611	.968

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268

City of Chino Hills
N/S: Carbon Canyon Road
E/W: Canyon Hills Road
Weather: Clear

File Name : 02_CHHCCCHPM
Site Code : 05723534
Start Date : 5/23/2023
Page No : 2



Peak Hour Analysis From 04:15 PM to 05:00 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:15 PM			04:15 PM			04:15 PM		
+0 mins.	**103**	6	**109**	2	303	305	5	4	9
+15 mins.	78	**12**	90	**4**	297	301	**7**	1	8
+30 mins.	81	10	91	3	301	304	7	**11**	**18**
+45 mins.	68	8	76	2	**316**	**318**	5	4	9
Total Volume	330	36	366	11	1217	1228	24	20	44
% App. Total	90.2	9.8		0.9	99.1		54.5	45.5	
PHF	.801	.750	.839	.688	.963	.965	.857	.455	.611

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268

City of Chino Hills
N/S: Carbon Canyon Road
E/W: Canyon Hills Road
Weather: Clear

File Name : 02_CHHCCCHPM
Site Code : 05723534
Start Date : 5/23/2023
Page No : 1

Groups Printed- Large 2 Axle Vehicles

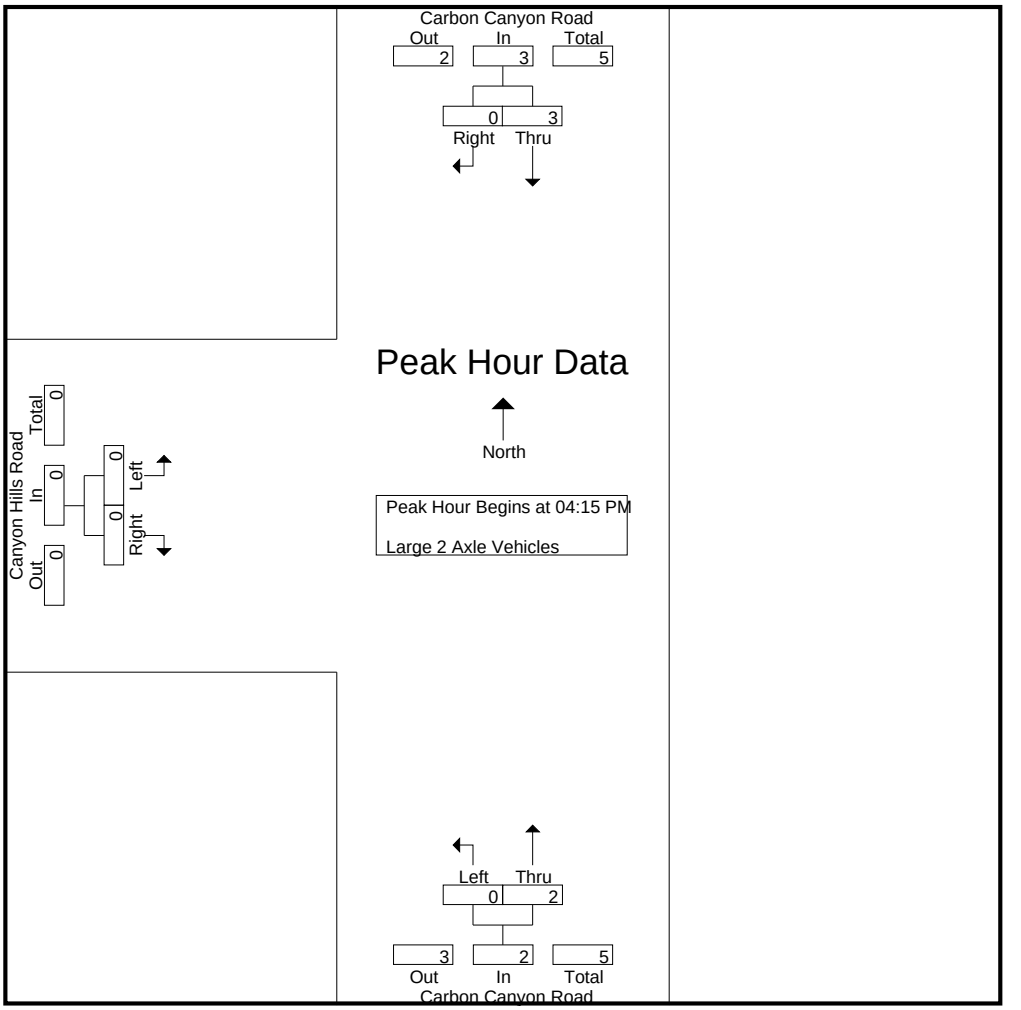
	Carbon Canyon Road Southbound			Carbon Canyon Road Northbound			Canyon Hills Road Eastbound			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
04:00 PM	1	0	1	0	1	1	0	0	0	2
04:15 PM	2	0	2	0	1	1	0	0	0	3
04:30 PM	0	0	0	0	0	0	0	0	0	0
04:45 PM	1	0	1	0	1	1	0	0	0	2
Total	4	0	4	0	3	3	0	0	0	7
05:00 PM	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0
05:45 PM	1	0	1	0	0	0	0	0	0	1
Total	1	0	1	0	0	0	0	0	0	1
Grand Total	5	0	5	0	3	3	0	0	0	8
Apprch %	100	0		0	100		0	0		
Total %	62.5	0	62.5	0	37.5	37.5	0	0	0	

	Carbon Canyon Road Southbound			Carbon Canyon Road Northbound			Canyon Hills Road Eastbound			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
Peak Hour Analysis From 04:15 PM to 05:00 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:15 PM										
04:15 PM	**2**	0	**2**	0	**1**	**1**	0	0	0	**3**
04:30 PM	0	0	0	0	0	0	0	0	0	0
04:45 PM	1	0	1	0	1	1	0	0	0	2
05:00 PM	0	0	0	0	0	0	0	0	0	0
Total Volume	3	0	3	0	2	2	0	0	0	5
% App. Total	100	0		0	100		0	0		
PHF	.375	.000	.375	.000	.500	.500	.000	.000	.000	.417

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268

City of Chino Hills
N/S: Carbon Canyon Road
E/W: Canyon Hills Road
Weather: Clear

File Name : 02_CHHCCCHPM
Site Code : 05723534
Start Date : 5/23/2023
Page No : 2



Peak Hour Analysis From 04:15 PM to 05:00 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:15 PM			04:15 PM			04:15 PM		
+0 mins.	**2**	0	**2**	0	**1**	**1**	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0
+30 mins.	1	0	1	0	1	1	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0
Total Volume	3	0	3	0	2	2	0	0	0
% App. Total	100	0		0	100		0	0	
PHF	.375	.000	.375	.000	.500	.500	.000	.000	.000

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268

City of Chino Hills
N/S: Carbon Canyon Road
E/W: Canyon Hills Road
Weather: Clear

File Name : 02_CHHCCCHPM
Site Code : 05723534
Start Date : 5/23/2023
Page No : 1

Groups Printed- 3 Axle Vehicles

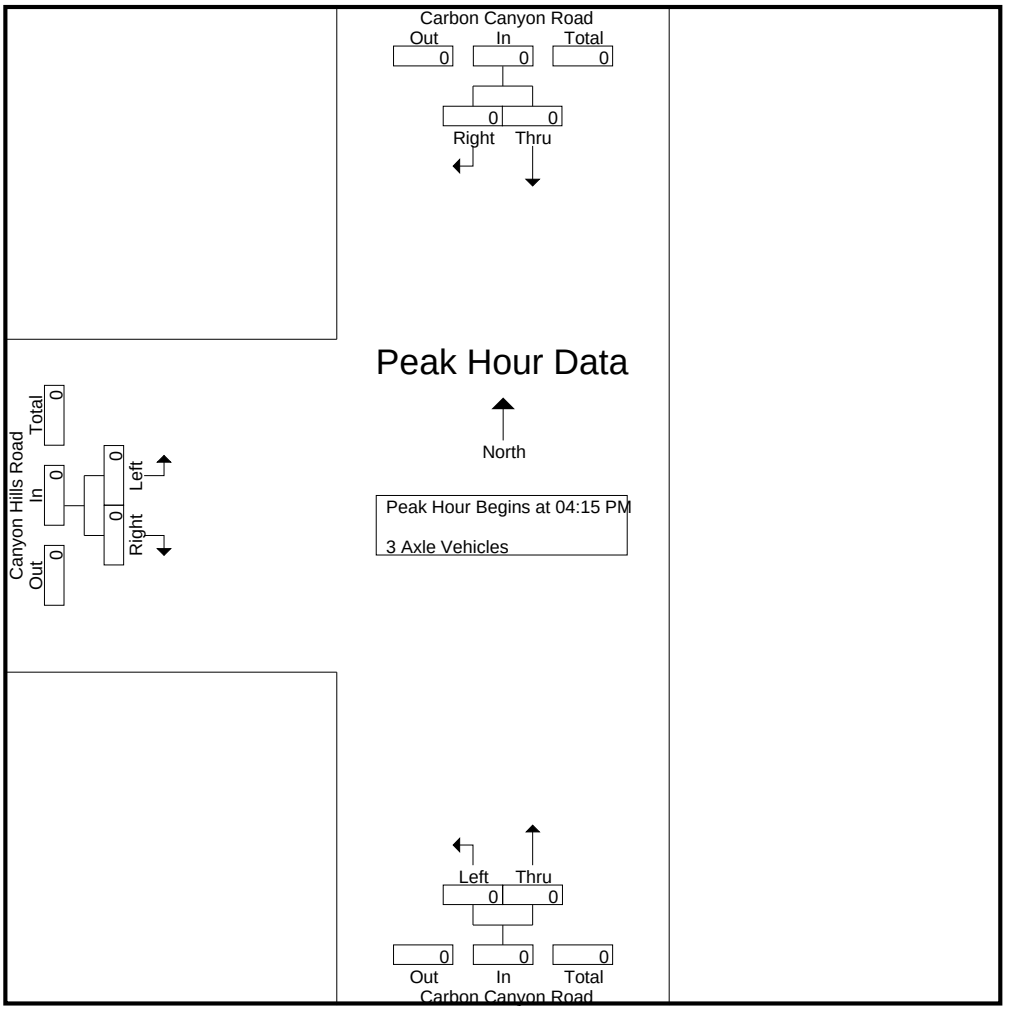
	Carbon Canyon Road Southbound			Carbon Canyon Road Northbound			Canyon Hills Road Eastbound			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
04:00 PM	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0
Apprch %	0	0		0	0		0	0		
Total %										

	Carbon Canyon Road Southbound			Carbon Canyon Road Northbound			Canyon Hills Road Eastbound			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
Peak Hour Analysis From 04:15 PM to 05:00 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:15 PM										
04:15 PM	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0		0	0		0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268

City of Chino Hills
N/S: Carbon Canyon Road
E/W: Canyon Hills Road
Weather: Clear

File Name : 02_CHHCCCHPM
Site Code : 05723534
Start Date : 5/23/2023
Page No : 2



Peak Hour Analysis From 04:15 PM to 05:00 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:15 PM			04:15 PM			04:15 PM		
+0 mins.	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	0	0	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0
% App. Total	0	0		0	0		0	0	
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268

City of Chino Hills
N/S: Carbon Canyon Road
E/W: Canyon Hills Road
Weather: Clear

File Name : 02_CHHCCCHPM
Site Code : 05723534
Start Date : 5/23/2023
Page No : 1

Groups Printed- 4+ Axle Trucks

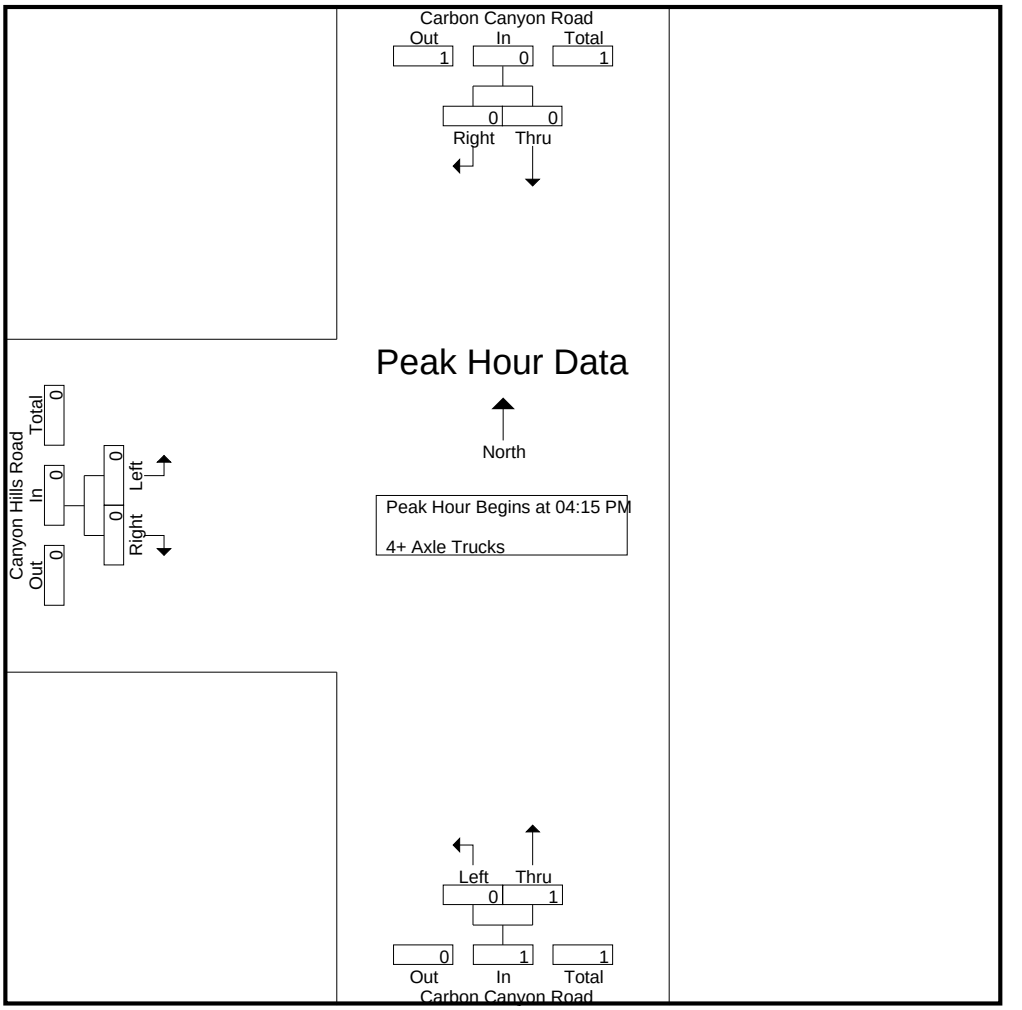
	Carbon Canyon Road Southbound			Carbon Canyon Road Northbound			Canyon Hills Road Eastbound			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
04:00 PM	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	1	1	0	0	0	1
04:45 PM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	1	1	0	0	0	1
05:00 PM	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	1	1	0	0	0	1
Apprch %	0	0		0	100		0	0		
Total %	0	0	0	0	100	100	0	0	0	

	Carbon Canyon Road Southbound			Carbon Canyon Road Northbound			Canyon Hills Road Eastbound			
Start Time	Thru	Right	App. Total	Left	Thru	App. Total	Left	Right	App. Total	Int. Total
Peak Hour Analysis From 04:15 PM to 05:00 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:15 PM										
04:15 PM	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	**1**	**1**	0	0	0	**1**
04:45 PM	0	0	0	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	1	1	0	0	0	1
% App. Total	0	0		0	100		0	0		
PHF	.000	.000	.000	.000	.250	.250	.000	.000	.000	.250

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268

City of Chino Hills
N/S: Carbon Canyon Road
E/W: Canyon Hills Road
Weather: Clear

File Name : 02_CHHCCCHPM
Site Code : 05723534
Start Date : 5/23/2023
Page No : 2



Peak Hour Analysis From 04:15 PM to 05:00 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:15 PM			04:15 PM			04:15 PM		
+0 mins.	0	0	0	0	0	0	0	0	0
+15 mins.	0	0	0	0	**1**	**1**	0	0	0
+30 mins.	0	0	0	0	0	0	0	0	0
+45 mins.	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	1	1	0	0	0
% App. Total	0	0		0	100		0	0	
PHF	.000	.000	.000	.000	.250	.250	.000	.000	.000

APPENDIX B-II

ROADWAY SEGMENT COUNTS

Counts Unlimited, Inc.

PO Box 1178
Corona, CA 92878
Phone: (951) 268-6268
email: counts@countsunlimited.com

City of Chino Hills
Grand Avenue
E/ Peyton Drive
24 Hour Directional Classification Count

CHH001
Site Code: 057-22517

Eastbound

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
05/24/22	**1**	91	2	0	0	0	0	0	1	0	0	0	0	95
01:00	0	26	0	0	0	0	0	0	0	0	0	0	0	26
02:00	0	19	0	0	0	0	0	0	1	0	0	0	0	20
03:00	0	11	1	0	0	0	0	0	1	0	0	0	0	13
04:00	0	40	2	1	3	0	0	0	1	0	0	0	0	47
05:00	0	54	12	1	3	0	0	0	0	0	0	0	0	70
06:00	0	135	21	1	4	**1**	0	0	**2**	0	0	0	0	164
07:00	0	506	41	2	1	0	0	0	2	0	0	0	0	552
08:00	1	567	35	**4**	1	0	0	0	1	0	0	0	0	609
09:00	0	491	42	1	5	1	0	0	2	0	0	0	0	542
10:00	0	565	**60**	1	5	0	**1**	2	1	0	0	0	0	635
11:00	0	**675**	54	3	**11**	1	0	**3**	1	0	0	0	0	**748**
12 PM	0	903	91	2	**12**	**1**	0	**1**	1	0	0	0	0	1011
13:00	1	903	80	**4**	7	1	0	0	0	0	0	0	0	996
14:00	**2**	949	86	1	6	0	0	1	1	0	0	0	0	1046
15:00	2	1037	**93**	1	6	0	0	1	**3**	0	0	0	0	1143
16:00	0	950	76	2	4	1	0	1	0	0	0	0	0	1034
17:00	0	**1064**	76	1	3	0	0	0	0	0	0	0	0	**1144**
18:00	0	958	69	2	3	0	0	0	1	0	0	0	0	1033
19:00	1	840	51	1	0	0	0	0	0	0	0	0	0	893
20:00	1	617	25	1	0	0	0	0	0	0	0	0	0	644
21:00	0	584	23	1	0	0	0	0	0	0	0	0	0	608
22:00	0	295	8	1	2	0	0	0	0	0	0	0	0	306
23:00	0	162	2	0	4	0	0	0	0	0	0	0	0	168
Total	9	12442	950	31	80	6	1	9	19	0	0	0	0	13547
Percent	0.1%	91.8%	7.0%	0.2%	0.6%	0.0%	0.0%	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%	
AM Peak	00:00	11:00	10:00	08:00	11:00	06:00	10:00	11:00	06:00					11:00
Vol.	1	675	60	4	11	1	1	3	2					748
PM Peak	14:00	17:00	15:00	13:00	12:00	12:00		12:00	15:00					17:00
Vol.	2	1064	93	4	12	1		1	3					1144
Grand Total	9	12442	950	31	80	6	1	9	19	0	0	0	0	13547
Percent	0.1%	91.8%	7.0%	0.2%	0.6%	0.0%	0.0%	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%	

Counts Unlimited, Inc.

PO Box 1178
Corona, CA 92878
Phone: (951) 268-6268
email: counts@countsunlimited.com

City of Chino Hills
Grand Avenue
E/ Peyton Drive
24 Hour Directional Classification Count

CHH001
Site Code: 057-22517

Westbound

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
05/24/22	0	48	1	0	0	0	0	0	0	0	0	0	0	49
01:00	0	8	2	0	0	0	0	0	0	0	0	0	0	10
02:00	0	14	3	0	1	0	0	0	0	0	0	0	0	18
03:00	0	10	1	0	2	0	0	0	2	0	0	0	0	15
04:00	0	35	4	0	1	0	0	0	2	0	0	0	0	42
05:00	0	112	22	0	3	0	0	0	0	0	0	0	0	137
06:00	0	388	68	**2**	10	1	0	2	**3**	0	0	0	0	474
07:00	0	736	**91**	1	2	1	0	1	2	0	0	0	0	**834**
08:00	0	594	54	1	**16**	**2**	0	0	2	0	0	0	0	669
09:00	0	475	56	1	7	0	0	2	1	0	0	0	0	542
10:00	1	570	63	0	7	0	0	0	0	0	0	0	0	641
11:00	**2**	**737**	53	0	14	0	0	**3**	0	0	0	0	0	809
12 PM	0	835	71	0	**9**	**1**	0	0	**2**	0	0	0	0	918
13:00	0	852	51	**2**	8	0	0	0	1	0	0	0	0	914
14:00	**1**	907	68	0	3	0	0	**1**	0	0	0	0	0	980
15:00	0	753	72	0	2	0	0	1	0	0	0	0	0	828
16:00	1	820	53	1	3	0	0	0	2	0	0	0	0	880
17:00	1	**1042**	**73**	0	2	0	0	0	1	0	0	0	0	**1119**
18:00	0	865	43	0	1	0	0	0	0	0	0	0	0	909
19:00	0	652	49	0	1	0	0	1	0	0	0	0	0	703
20:00	0	546	20	0	1	0	0	0	0	0	0	0	0	567
21:00	0	437	27	0	0	0	0	0	0	0	0	0	0	464
22:00	0	227	11	0	0	1	0	0	0	0	0	0	0	239
23:00	0	101	2	0	1	0	0	0	1	0	0	0	0	105
Total	6	11764	958	8	94	6	0	11	19	0	0	0	0	12866
Percent	0.0%	91.4%	7.4%	0.1%	0.7%	0.0%	0.0%	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%	
AM Peak	11:00	11:00	07:00	06:00	08:00	08:00		11:00	06:00					07:00
Vol.	2	737	91	2	16	2		3	3					834
PM Peak	14:00	17:00	17:00	13:00	12:00	12:00		14:00	12:00					17:00
Vol.	1	1042	73	2	9	1		1	2					1119
Grand Total	6	11764	958	8	94	6	0	11	19	0	0	0	0	12866
Percent	0.0%	91.4%	7.4%	0.1%	0.7%	0.0%	0.0%	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%	

Counts Unlimited, Inc.

PO Box 1178
Corona, CA 92878
Phone: (951) 268-6268
email: counts@countsunlimited.com

City of Chino Hills
Grand Avenue
E/ Peyton Drive
24 Hour Directional Classification Count

CHH001
Site Code: 057-22517

Eastbound, Westbound

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
05/24/22	1	139	3	0	0	0	0	0	1	0	0	0	0	144
01:00	0	34	2	0	0	0	0	0	0	0	0	0	0	36
02:00	0	33	3	0	1	0	0	0	1	0	0	0	0	38
03:00	0	21	2	0	2	0	0	0	3	0	0	0	0	28
04:00	0	75	6	1	4	0	0	0	3	0	0	0	0	89
05:00	0	166	34	1	6	0	0	0	0	0	0	0	0	207
06:00	0	523	89	3	14	**2**	0	2	**5**	0	0	0	0	638
07:00	0	1242	**132**	3	3	1	0	1	4	0	0	0	0	1386
08:00	1	1161	89	**5**	17	2	0	0	3	0	0	0	0	1278
09:00	0	966	98	2	12	1	0	2	3	0	0	0	0	1084
10:00	1	1135	123	1	12	0	**1**	2	1	0	0	0	0	1276
11:00	**2**	**1412**	107	3	**25**	1	0	**6**	1	0	0	0	0	**1557**
12 PM	0	1738	162	2	**21**	**2**	0	1	**3**	0	0	0	0	1929
13:00	1	1755	131	**6**	15	1	0	0	1	0	0	0	0	1910
14:00	**3**	1856	154	1	9	0	0	**2**	1	0	0	0	0	2026
15:00	2	1790	**165**	1	8	0	0	2	3	0	0	0	0	1971
16:00	1	1770	129	3	7	1	0	1	2	0	0	0	0	1914
17:00	1	**2106**	149	1	5	0	0	0	1	0	0	0	0	**2263**
18:00	0	1823	112	2	4	0	0	0	1	0	0	0	0	1942
19:00	1	1492	100	1	1	0	0	1	0	0	0	0	0	1596
20:00	1	1163	45	1	1	0	0	0	0	0	0	0	0	1211
21:00	0	1021	50	1	0	0	0	0	0	0	0	0	0	1072
22:00	0	522	19	1	2	1	0	0	0	0	0	0	0	545
23:00	0	263	4	0	5	0	0	0	1	0	0	0	0	273
Total	15	24206	1908	39	174	12	1	20	38	0	0	0	0	26413
Percent	0.1%	91.6%	7.2%	0.1%	0.7%	0.0%	0.0%	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%	
AM Peak	11:00	11:00	07:00	08:00	11:00	06:00	10:00	11:00	06:00					11:00
Vol.	2	1412	132	5	25	2	1	6	5					1557
PM Peak	14:00	17:00	15:00	13:00	12:00	12:00		14:00	12:00					17:00
Vol.	3	2106	165	6	21	2		2	3					2263
Grand Total	15	24206	1908	39	174	12	1	20	38	0	0	0	0	26413
Percent	0.1%	91.6%	7.2%	0.1%	0.7%	0.0%	0.0%	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%	

Counts Unlimited, Inc.

PO Box 1178
Corona, CA 92878
Phone: (951) 268-6268
email: counts@countsunlimited.com

City of Chino Hills
Boys Republic Drive
S/ Shoppes Drive
24 Hour Directional Classification Count

CHH002
Site Code: 057-22517

Northbound

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
05/24/22	0	22	2	0	0	0	0	0	0	0	0	0	0	24
01:00	0	1	0	0	1	0	0	0	0	0	0	0	0	2
02:00	0	7	0	0	0	0	0	0	0	0	0	0	0	7
03:00	0	2	0	0	0	0	0	0	**1**	0	0	0	0	3
04:00	0	9	0	0	0	0	0	0	1	0	0	0	0	10
05:00	**2**	29	5	0	0	0	0	0	0	0	0	0	0	36
06:00	0	96	10	0	0	0	0	0	0	0	0	0	0	106
07:00	0	264	**45**	**6**	3	0	0	0	1	0	0	0	0	319
08:00	0	221	28	0	5	0	0	0	0	0	0	0	0	254
09:00	0	219	21	0	5	0	0	1	0	0	0	0	0	246
10:00	1	240	29	0	2	0	0	0	0	0	0	0	0	272
11:00	0	**309**	26	0	**7**	**1**	0	**2**	1	0	0	0	0	**346**
12 PM	0	**516**	35	0	3	0	0	0	**1**	0	0	0	0	**555**
13:00	0	453	25	0	**7**	0	0	1	0	0	0	0	0	486
14:00	0	388	38	0	0	0	0	0	0	0	0	0	0	426
15:00	**1**	339	**39**	0	3	**1**	0	**2**	0	0	0	0	0	385
16:00	1	398	34	0	3	0	0	0	0	0	0	0	0	436
17:00	0	505	29	**1**	1	0	0	0	1	0	0	0	0	537
18:00	1	328	36	0	1	0	0	0	0	0	0	0	0	366
19:00	0	311	22	1	0	0	0	0	1	0	0	0	0	335
20:00	1	296	19	0	2	0	0	0	0	0	0	0	0	318
21:00	1	477	22	0	0	0	0	0	0	0	0	0	0	500
22:00	0	170	8	0	1	0	0	0	0	0	0	0	0	179
23:00	0	76	2	0	0	0	0	0	0	0	0	0	0	78
Total	8	5676	475	8	44	2	0	6	7	0	0	0	0	6226
Percent	0.1%	91.2%	7.6%	0.1%	0.7%	0.0%	0.0%	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%	
AM Peak	05:00	11:00	07:00	07:00	11:00	11:00		11:00	03:00					11:00
Vol.	2	309	45	6	7	1		2	1					346
PM Peak	15:00	12:00	15:00	17:00	13:00	15:00		15:00	12:00					12:00
Vol.	1	516	39	1	7	1		2	1					555
Grand Total	8	5676	475	8	44	2	0	6	7	0	0	0	0	6226
Percent	0.1%	91.2%	7.6%	0.1%	0.7%	0.0%	0.0%	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%	

Counts Unlimited, Inc.

PO Box 1178
Corona, CA 92878
Phone: (951) 268-6268
email: counts@countsunlimited.com

City of Chino Hills
Boys Republic Drive
S/ Shoppes Drive
24 Hour Directional Classification Count

CHH002
Site Code: 057-22517

Southbound

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
05/24/22	0	11	1	0	0	0	0	0	0	0	0	0	0	12
01:00	0	3	0	0	0	0	0	1	1	0	0	0	0	5
02:00	0	6	0	0	0	0	0	0	0	0	0	0	0	6
03:00	0	7	0	0	0	0	0	0	1	0	0	0	0	8
04:00	0	27	0	**1**	0	0	0	0	0	0	0	0	0	28
05:00	0	42	10	1	1	0	0	0	0	0	0	0	0	54
06:00	**2**	206	20	1	1	**1**	0	0	0	0	0	0	0	231
07:00	0	397	37	1	**7**	0	0	1	1	0	0	0	0	444
08:00	0	326	26	1	5	0	0	1	0	0	0	0	0	359
09:00	0	267	40	1	4	1	0	0	0	0	0	0	0	313
10:00	1	357	32	1	7	1	0	**3**	**2**	0	0	0	0	404
11:00	0	**413**	**52**	1	4	0	0	2	0	0	0	0	0	**472**
12 PM	0	508	36	1	**4**	0	0	0	0	0	0	0	0	549
13:00	1	446	37	**2**	2	**1**	0	0	0	0	0	0	0	489
14:00	0	386	33	1	3	1	0	**1**	0	0	0	0	0	425
15:00	**2**	395	**38**	1	1	0	0	0	0	0	0	0	0	437
16:00	1	476	34	1	1	0	0	0	0	0	0	0	0	513
17:00	0	**593**	38	1	0	0	0	0	0	0	0	0	0	**632**
18:00	0	519	36	2	0	0	0	0	0	0	0	0	0	557
19:00	1	317	22	1	2	0	0	0	0	0	0	0	0	343
20:00	0	228	11	2	0	0	0	0	0	0	0	0	0	241
21:00	0	150	11	1	0	0	0	0	0	0	0	0	0	162
22:00	0	87	5	1	0	0	0	0	0	0	0	0	0	93
23:00	0	33	2	0	0	0	0	0	0	0	0	0	0	35
Total	8	6200	521	22	42	5	0	9	5	0	0	0	0	6812
Percent	0.1%	91.0%	7.6%	0.3%	0.6%	0.1%	0.0%	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%	
AM Peak	06:00	11:00	11:00	04:00	07:00	06:00		10:00	10:00					11:00
Vol.	2	413	52	1	7	1		3	2					472
PM Peak	15:00	17:00	15:00	13:00	12:00	13:00		14:00						17:00
Vol.	2	593	38	2	4	1		1						632
Grand Total	8	6200	521	22	42	5	0	9	5	0	0	0	0	6812
Percent	0.1%	91.0%	7.6%	0.3%	0.6%	0.1%	0.0%	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%	

Counts Unlimited, Inc.

PO Box 1178
Corona, CA 92878
Phone: (951) 268-6268
email: counts@countsunlimited.com

City of Chino Hills
Boys Republic Drive
S/ Shoppes Drive
24 Hour Directional Classification Count
Northbound, Southbound

CHH002
Site Code: 057-22517

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
05/24/22	0	33	3	0	0	0	0	0	0	0	0	0	0	36
01:00	0	4	0	0	1	0	0	1	1	0	0	0	0	7
02:00	0	13	0	0	0	0	0	0	0	0	0	0	0	13
03:00	0	9	0	0	0	0	0	0	**2**	0	0	0	0	11
04:00	0	36	0	1	0	0	0	0	1	0	0	0	0	38
05:00	**2**	71	15	1	1	0	0	0	0	0	0	0	0	90
06:00	2	302	30	1	1	**1**	0	0	0	0	0	0	0	337
07:00	0	661	**82**	**7**	10	0	0	1	2	0	0	0	0	763
08:00	0	547	54	1	10	0	0	1	0	0	0	0	0	613
09:00	0	486	61	1	9	1	0	1	0	0	0	0	0	559
10:00	2	597	61	1	9	1	0	3	2	0	0	0	0	676
11:00	0	**722**	78	1	**11**	1	0	**4**	1	0	0	0	0	**818**
12 PM	0	1024	71	1	7	0	0	0	**1**	0	0	0	0	1104
13:00	1	899	62	**2**	**9**	**1**	0	1	0	0	0	0	0	975
14:00	0	774	71	1	3	1	0	1	0	0	0	0	0	851
15:00	**3**	734	**77**	1	4	1	0	**2**	0	0	0	0	0	822
16:00	2	874	68	1	4	0	0	0	0	0	0	0	0	949
17:00	0	**1098**	67	2	1	0	0	0	1	0	0	0	0	**1169**
18:00	1	847	72	2	1	0	0	0	0	0	0	0	0	923
19:00	1	628	44	2	2	0	0	0	1	0	0	0	0	678
20:00	1	524	30	2	2	0	0	0	0	0	0	0	0	559
21:00	1	627	33	1	0	0	0	0	0	0	0	0	0	662
22:00	0	257	13	1	1	0	0	0	0	0	0	0	0	272
23:00	0	109	4	0	0	0	0	0	0	0	0	0	0	113
Total	16	11876	996	30	86	7	0	15	12	0	0	0	0	13038
Percent	0.1%	91.1%	7.6%	0.2%	0.7%	0.1%	0.0%	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%	
AM Peak	05:00	11:00	07:00	07:00	11:00	06:00		11:00	03:00					11:00
Vol.	2	722	82	7	11	1		4	2					818
PM Peak	15:00	17:00	15:00	13:00	13:00	13:00		15:00	12:00					17:00
Vol.	3	1098	77	2	9	1		2	1					1169
Grand Total	16	11876	996	30	86	7	0	15	12	0	0	0	0	13038
Percent	0.1%	91.1%	7.6%	0.2%	0.7%	0.1%	0.0%	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%	

Counts Unlimited, Inc.

PO Box 1178
Corona, CA 92878
Phone: (951) 268-6268
email: counts@countsunlimited.com

City of Chino Hills
Peyton Drive
S/ Eucalyptus Avenue
24 Hour Directional Classification Count

CHH003
Site Code: 057-22517

Northbound

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
05/24/22	0	11	0	0	0	0	0	0	0	0	0	0	0	11
01:00	0	9	0	0	0	0	0	0	0	0	0	0	0	9
02:00	0	6	1	0	0	0	0	0	0	0	0	0	0	7
03:00	0	17	1	0	0	0	0	**1**	0	0	0	0	0	19
04:00	0	45	4	0	0	0	0	1	0	0	0	0	0	50
05:00	0	75	9	0	1	0	0	0	0	0	0	0	0	85
06:00	**1**	353	35	0	1	1	0	0	0	0	0	0	0	391
07:00	1	**591**	47	2	1	**3**	0	0	0	0	0	0	0	**645**
08:00	1	500	40	**7**	2	0	0	1	0	0	0	0	0	551
09:00	0	371	39	0	1	2	0	0	0	0	0	0	0	413
10:00	1	406	50	0	4	0	0	0	0	0	0	0	0	461
11:00	1	400	**64**	5	**6**	1	0	1	0	0	0	0	0	478
12 PM	1	574	53	1	2	0	0	0	0	0	0	0	0	631
13:00	0	432	59	**2**	**3**	0	0	0	0	0	0	0	0	496
14:00	0	519	69	1	1	0	0	0	0	0	0	0	0	590
15:00	**2**	603	72	1	3	0	0	0	0	0	0	0	0	681
16:00	0	658	73	1	1	**1**	0	0	0	0	0	0	0	734
17:00	1	**839**	**87**	0	0	0	0	0	0	0	0	0	0	**927**
18:00	0	510	53	0	0	0	0	0	**1**	0	0	0	0	564
19:00	0	323	25	0	0	1	0	0	0	0	0	0	0	349
20:00	0	209	19	0	1	0	0	0	0	0	0	0	0	229
21:00	0	137	17	0	2	0	0	0	0	0	0	0	0	156
22:00	0	92	9	0	0	0	0	0	0	0	0	0	0	101
23:00	0	58	5	0	0	0	0	0	0	0	0	0	0	63
Total	9	7738	831	20	29	9	0	4	1	0	0	0	0	8641
Percent	0.1%	89.5%	9.6%	0.2%	0.3%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak	06:00	07:00	11:00	08:00	11:00	07:00		03:00						07:00
Vol.	1	591	64	7	6	3		1						645
PM Peak	15:00	17:00	17:00	13:00	13:00	16:00			18:00					17:00
Vol.	2	839	87	2	3	1			1					927
Grand Total	9	7738	831	20	29	9	0	4	1	0	0	0	0	8641
Percent	0.1%	89.5%	9.6%	0.2%	0.3%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	

Counts Unlimited, Inc.

PO Box 1178
Corona, CA 92878
Phone: (951) 268-6268
email: counts@countsunlimited.com

City of Chino Hills
Peyton Drive
S/ Eucalyptus Avenue
24 Hour Directional Classification Count

CHH003
Site Code: 057-22517

Southbound

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
05/24/22	0	29	3	0	0	0	0	0	0	0	0	0	0	32
01:00	0	24	2	0	0	0	0	0	0	0	0	0	0	26
02:00	0	10	1	0	1	0	0	0	0	0	0	0	0	12
03:00	0	11	1	0	0	0	0	0	**2**	0	0	0	0	14
04:00	0	24	1	0	0	0	0	0	0	0	0	0	0	25
05:00	0	73	14	1	1	0	0	0	0	0	0	0	0	89
06:00	0	427	45	3	14	0	0	0	0	0	0	0	0	489
07:00	1	**722**	74	**7**	6	0	0	1	0	0	0	0	0	**811**
08:00	**2**	526	64	2	8	1	0	**2**	0	0	0	0	0	605
09:00	0	342	48	0	5	0	**2**	1	0	0	0	0	0	398
10:00	1	398	58	1	19	2	0	1	2	0	0	0	0	482
11:00	2	557	**85**	2	**21**	**4**	0	0	1	0	0	0	0	672
12 PM	1	**920**	77	**10**	**6**	**1**	0	0	0	0	0	0	0	**1015**
13:00	0	652	62	6	6	1	0	**1**	**2**	0	0	0	0	730
14:00	0	730	68	1	5	0	0	1	0	0	0	0	0	805
15:00	0	812	81	6	3	1	0	1	1	0	0	0	0	905
16:00	0	751	81	0	3	1	0	0	0	0	0	0	0	836
17:00	0	767	**83**	0	3	0	0	0	0	0	0	0	0	853
18:00	0	666	43	0	0	1	0	0	0	0	0	0	0	710
19:00	**2**	503	35	0	2	0	0	0	1	0	0	0	0	543
20:00	1	424	26	0	1	0	0	0	0	0	0	0	0	452
21:00	0	521	17	0	1	0	0	0	0	0	0	0	0	539
22:00	0	218	11	0	1	0	0	0	0	0	0	0	0	230
23:00	0	86	6	0	0	0	0	0	0	0	0	0	0	92
Total	10	10193	986	39	106	12	2	8	9	0	0	0	0	11365
Percent	0.1%	89.7%	8.7%	0.3%	0.9%	0.1%	0.0%	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%	
AM Peak	08:00	07:00	11:00	07:00	11:00	11:00	09:00	08:00	03:00					07:00
Vol.	2	722	85	7	21	4	2	2	2					811
PM Peak	19:00	12:00	17:00	12:00	12:00	12:00		13:00	13:00					12:00
Vol.	2	920	83	10	6	1		1	2					1015
Grand Total	10	10193	986	39	106	12	2	8	9	0	0	0	0	11365
Percent	0.1%	89.7%	8.7%	0.3%	0.9%	0.1%	0.0%	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%	

Counts Unlimited, Inc.

PO Box 1178
Corona, CA 92878
Phone: (951) 268-6268
email: counts@countsunlimited.com

City of Chino Hills
Peyton Drive
S/ Eucalyptus Avenue
24 Hour Directional Classification Count
Northbound, Southbound

CHH003
Site Code: 057-22517

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
05/24/22	0	40	3	0	0	0	0	0	0	0	0	0	0	43
01:00	0	33	2	0	0	0	0	0	0	0	0	0	0	35
02:00	0	16	2	0	1	0	0	0	0	0	0	0	0	19
03:00	0	28	2	0	0	0	0	1	**2**	0	0	0	0	33
04:00	0	69	5	0	0	0	0	1	0	0	0	0	0	75
05:00	0	148	23	1	2	0	0	0	0	0	0	0	0	174
06:00	1	780	80	3	15	1	0	0	0	0	0	0	0	880
07:00	2	**1313**	121	**9**	7	3	0	1	0	0	0	0	0	**1456**
08:00	**3**	1026	104	9	10	1	0	**3**	0	0	0	0	0	1156
09:00	0	713	87	0	6	2	**2**	1	0	0	0	0	0	811
10:00	2	804	108	1	23	2	0	1	2	0	0	0	0	943
11:00	3	957	**149**	7	**27**	**5**	0	1	1	0	0	0	0	1150
12 PM	**2**	1494	130	**11**	8	1	0	0	0	0	0	0	0	1646
13:00	0	1084	121	8	**9**	1	0	**1**	**2**	0	0	0	0	1226
14:00	0	1249	137	2	6	0	0	1	0	0	0	0	0	1395
15:00	2	1415	153	7	6	1	0	1	1	0	0	0	0	1586
16:00	0	1409	154	1	4	**2**	0	0	0	0	0	0	0	1570
17:00	1	**1606**	**170**	0	3	0	0	0	0	0	0	0	0	**1780**
18:00	0	1176	96	0	0	1	0	0	1	0	0	0	0	1274
19:00	2	826	60	0	2	1	0	0	1	0	0	0	0	892
20:00	1	633	45	0	2	0	0	0	0	0	0	0	0	681
21:00	0	658	34	0	3	0	0	0	0	0	0	0	0	695
22:00	0	310	20	0	1	0	0	0	0	0	0	0	0	331
23:00	0	144	11	0	0	0	0	0	0	0	0	0	0	155
Total	19	17931	1817	59	135	21	2	12	10	0	0	0	0	20006
Percent	0.1%	89.6%	9.1%	0.3%	0.7%	0.1%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak	08:00	07:00	11:00	07:00	11:00	11:00	09:00	08:00	03:00					07:00
Vol.	3	1313	149	9	27	5	2	3	2					1456
PM Peak	12:00	17:00	17:00	12:00	13:00	16:00		13:00	13:00					17:00
Vol.	2	1606	170	11	9	2		1	2					1780
Grand Total	19	17931	1817	59	135	21	2	12	10	0	0	0	0	20006
Percent	0.1%	89.6%	9.1%	0.3%	0.7%	0.1%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	

Counts Unlimited, Inc.

PO Box 1178
Corona, CA 92878
Phone: (951) 268-6268
email: counts@countsunlimited.com

City of Chino Hills
Carbon Canyon Road
S/ Chino Hills Parkway
24 Hour Directional Classification Count

CHH004
Site Code: 057-22517

Northbound

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
05/24/22	1	40	1	0	0	0	0	0	0	0	0	0	0	42
01:00	0	30	1	0	0	0	0	0	0	0	0	0	0	31
02:00	0	13	1	0	0	0	0	0	0	0	0	0	0	14
03:00	0	16	2	0	0	0	0	0	0	0	0	0	0	18
04:00	0	29	2	0	0	0	0	0	0	0	0	0	0	31
05:00	0	55	14	0	0	0	0	0	0	0	0	0	0	69
06:00	0	178	38	**1**	0	0	0	0	**1**	0	0	0	0	218
07:00	1	360	**79**	1	3	**6**	0	**1**	0	0	0	0	0	451
08:00	2	**393**	55	1	4	1	0	0	0	0	0	0	0	**456**
09:00	**4**	299	51	1	3	2	0	0	0	0	0	0	0	360
10:00	3	271	62	0	**8**	1	0	0	0	0	0	0	0	345
11:00	3	280	64	0	4	2	0	0	0	0	0	0	0	353
12 PM	3	332	64	1	3	2	0	**1**	0	0	0	0	0	406
13:00	2	381	106	**2**	8	3	0	1	**2**	0	0	0	0	505
14:00	6	627	137	1	5	**8**	0	0	0	0	0	0	0	784
15:00	8	961	198	0	**10**	5	**1**	1	0	0	0	0	0	1184
16:00	3	1121	**230**	1	8	0	0	0	0	0	0	0	0	**1363**
17:00	4	**1141**	175	0	3	0	0	1	0	0	0	0	0	1324
18:00	**9**	1087	116	0	6	1	0	0	1	0	0	0	0	1220
19:00	1	503	47	0	0	1	0	0	0	0	0	0	0	552
20:00	2	258	24	0	3	0	0	0	0	0	0	0	0	287
21:00	1	174	17	0	0	0	0	0	0	0	0	0	0	192
22:00	0	121	13	0	0	0	0	0	0	0	0	0	0	134
23:00	1	72	13	0	1	0	0	0	0	0	0	0	0	87
Total	54	8742	1510	9	69	32	1	5	4	0	0	0	0	10426
Percent	0.5%	83.8%	14.5%	0.1%	0.7%	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak	09:00	08:00	07:00	06:00	10:00	07:00		07:00	06:00					08:00
Vol.	4	393	79	1	8	6		1	1					456
PM Peak	18:00	17:00	16:00	13:00	15:00	14:00	15:00	12:00	13:00					16:00
Vol.	9	1141	230	2	10	8	1	1	2					1363
Grand Total	54	8742	1510	9	69	32	1	5	4	0	0	0	0	10426
Percent	0.5%	83.8%	14.5%	0.1%	0.7%	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	

Counts Unlimited, Inc.

PO Box 1178
Corona, CA 92878
Phone: (951) 268-6268
email: counts@countsunlimited.com

City of Chino Hills
Carbon Canyon Road
S/ Chino Hills Parkway
24 Hour Directional Classification Count

CHH004
Site Code: 057-22517

Southbound

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
05/24/22	0	29	1	0	0	0	0	0	0	0	0	0	0	30
01:00	0	5	2	0	0	0	0	0	0	0	0	0	0	7
02:00	0	6	1	0	0	0	0	0	0	0	0	0	0	7
03:00	0	23	6	0	0	0	0	0	0	0	0	0	0	29
04:00	0	88	22	0	0	0	0	0	0	0	0	0	0	110
05:00	3	323	87	1	1	1	0	0	0	0	0	0	0	416
06:00	3	772	**150**	0	13	0	0	2	**1**	0	0	0	0	941
07:00	**5**	**1065**	145	**2**	**14**	0	0	2	0	0	0	0	0	**1233**
08:00	4	709	120	0	11	**4**	0	**4**	0	0	0	0	0	852
09:00	2	409	67	1	12	3	0	0	0	0	0	0	0	494
10:00	3	277	63	0	8	1	0	0	1	0	0	0	0	353
11:00	1	284	50	0	5	3	0	1	0	0	0	0	0	344
12 PM	**5**	332	58	**1**	**7**	1	0	0	0	0	0	0	0	404
13:00	3	296	71	1	4	**2**	**1**	**1**	0	0	0	0	0	379
14:00	4	378	62	1	2	0	0	0	0	0	0	0	0	447
15:00	0	412	70	1	1	1	0	1	0	0	0	0	0	486
16:00	0	439	**78**	0	1	1	1	0	**1**	0	0	0	0	**521**
17:00	3	**454**	57	0	2	1	0	0	0	0	0	0	0	517
18:00	2	320	34	0	1	0	0	0	0	0	0	0	0	357
19:00	1	211	22	0	2	0	0	0	0	0	0	0	0	236
20:00	1	213	26	0	1	0	0	0	0	0	0	0	0	241
21:00	1	187	23	0	0	0	0	0	0	0	0	0	0	211
22:00	0	110	11	0	1	0	0	0	0	0	0	0	0	122
23:00	1	66	8	0	0	0	0	0	0	0	0	0	0	75
Total	42	7408	1234	8	86	18	2	11	3	0	0	0	0	8812
Percent	0.5%	84.1%	14.0%	0.1%	1.0%	0.2%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak	07:00	07:00	06:00	07:00	07:00	08:00		08:00	06:00					07:00
Vol.	5	1065	150	2	14	4		4	1					1233
PM Peak	12:00	17:00	16:00	12:00	12:00	13:00	13:00	13:00	16:00					16:00
Vol.	5	454	78	1	7	2	1	1	1					521
Grand Total	42	7408	1234	8	86	18	2	11	3	0	0	0	0	8812
Percent	0.5%	84.1%	14.0%	0.1%	1.0%	0.2%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	

Counts Unlimited, Inc.

PO Box 1178
Corona, CA 92878
Phone: (951) 268-6268
email: counts@countsunlimited.com

City of Chino Hills
Carbon Canyon Road
S/ Chino Hills Parkway
24 Hour Directional Classification Count
Northbound, Southbound

CHH004
Site Code: 057-22517

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
05/24/22	1	69	2	0	0	0	0	0	0	0	0	0	0	72
01:00	0	35	3	0	0	0	0	0	0	0	0	0	0	38
02:00	0	19	2	0	0	0	0	0	0	0	0	0	0	21
03:00	0	39	8	0	0	0	0	0	0	0	0	0	0	47
04:00	0	117	24	0	0	0	0	0	0	0	0	0	0	141
05:00	3	378	101	1	1	1	0	0	0	0	0	0	0	485
06:00	3	950	188	1	13	0	0	2	**2**	0	0	0	0	1159
07:00	**6**	**1425**	**224**	**3**	**17**	**6**	0	3	0	0	0	0	0	**1684**
08:00	6	1102	175	1	15	5	0	**4**	0	0	0	0	0	1308
09:00	6	708	118	2	15	5	0	0	0	0	0	0	0	854
10:00	6	548	125	0	16	2	0	0	1	0	0	0	0	698
11:00	4	564	114	0	9	5	0	1	0	0	0	0	0	697
12 PM	8	664	122	2	10	3	0	1	0	0	0	0	0	810
13:00	5	677	177	**3**	**12**	5	**1**	**2**	**2**	0	0	0	0	884
14:00	10	1005	199	2	7	**8**	0	0	0	0	0	0	0	1231
15:00	8	1373	268	1	11	6	1	2	0	0	0	0	0	1670
16:00	3	1560	**308**	1	9	1	1	0	1	0	0	0	0	**1884**
17:00	7	**1595**	232	0	5	1	0	1	0	0	0	0	0	1841
18:00	**11**	1407	150	0	7	1	0	0	1	0	0	0	0	1577
19:00	2	714	69	0	2	1	0	0	0	0	0	0	0	788
20:00	3	471	50	0	4	0	0	0	0	0	0	0	0	528
21:00	2	361	40	0	0	0	0	0	0	0	0	0	0	403
22:00	0	231	24	0	1	0	0	0	0	0	0	0	0	256
23:00	2	138	21	0	1	0	0	0	0	0	0	0	0	162
Total	96	16150	2744	17	155	50	3	16	7	0	0	0	0	19238
Percent	0.5%	83.9%	14.3%	0.1%	0.8%	0.3%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak	07:00	07:00	07:00	07:00	07:00	07:00		08:00	06:00					07:00
Vol.	6	1425	224	3	17	6		4	2					1684
PM Peak	18:00	17:00	16:00	13:00	13:00	14:00	13:00	13:00	13:00					16:00
Vol.	11	1595	308	3	12	8	1	2	2					1884
Grand Total	96	16150	2744	17	155	50	3	16	7	0	0	0	0	19238
Percent	0.5%	83.9%	14.3%	0.1%	0.8%	0.3%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	

Counts Unlimited, Inc.

PO Box 1178
Corona, CA 92878
Phone: (951) 268-6268
email: counts@countsunlimited.com

City of Chino Hills
Chino Hills Parkway
E/ Carbon Canyon Road
24 Hour Directional Classification Count

CHH005
Site Code: 057-22517

Eastbound

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
05/24/22	1	79	1	0	0	0	0	0	0	0	0	0	0	81
01:00	0	31	2	0	0	0	0	0	0	0	0	0	0	33
02:00	0	19	0	0	0	0	0	0	0	0	0	0	0	19
03:00	0	23	1	0	0	0	0	0	0	0	0	0	0	24
04:00	0	47	7	0	0	0	**1**	0	0	0	0	0	0	55
05:00	0	66	17	0	0	0	0	0	**1**	0	0	0	0	84
06:00	0	181	30	**3**	0	0	0	0	1	0	0	0	0	215
07:00	0	442	**91**	1	5	**3**	0	**2**	1	0	0	0	0	545
08:00	2	**583**	77	2	4	1	0	2	0	0	0	0	0	**671**
09:00	**4**	450	68	0	5	2	1	1	1	0	0	0	0	532
10:00	2	442	89	0	**11**	2	0	0	0	0	0	0	0	546
11:00	3	507	91	0	5	2	0	0	0	0	0	0	0	608
12 PM	7	557	95	0	2	2	0	0	0	0	0	0	0	663
13:00	5	627	129	**3**	14	3	0	**1**	**2**	0	0	0	0	784
14:00	4	830	164	3	4	**8**	0	1	0	0	0	0	0	1014
15:00	6	1308	209	2	**15**	5	**1**	1	0	0	0	0	0	1547
16:00	5	1364	**240**	1	10	0	0	0	1	0	0	0	0	1621
17:00	5	**1509**	219	0	3	0	0	1	0	0	0	0	0	**1737**
18:00	**8**	1362	124	0	7	1	0	0	2	0	0	0	0	1504
19:00	0	702	71	0	0	1	0	0	1	0	0	0	0	775
20:00	3	451	32	0	0	0	0	0	0	0	0	0	0	486
21:00	1	291	22	0	0	0	0	0	0	0	0	0	0	314
22:00	0	215	15	0	0	0	0	0	0	0	0	0	0	230
23:00	0	107	6	0	1	0	0	0	0	0	0	0	0	114
Total	56	12193	1800	15	86	30	3	9	10	0	0	0	0	14202
Percent	0.4%	85.9%	12.7%	0.1%	0.6%	0.2%	0.0%	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%	
AM Peak	09:00	08:00	07:00	06:00	10:00	07:00	04:00	07:00	05:00					08:00
Vol.	4	583	91	3	11	3	1	2	1					671
PM Peak	18:00	17:00	16:00	13:00	15:00	14:00	15:00	13:00	13:00					17:00
Vol.	8	1509	240	3	15	8	1	1	2					1737
Grand Total	56	12193	1800	15	86	30	3	9	10	0	0	0	0	14202
Percent	0.4%	85.9%	12.7%	0.1%	0.6%	0.2%	0.0%	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%	

Counts Unlimited, Inc.

PO Box 1178
Corona, CA 92878
Phone: (951) 268-6268
email: counts@countsunlimited.com

City of Chino Hills
Chino Hills Parkway
E/ Carbon Canyon Road
24 Hour Directional Classification Count

CHH005
Site Code: 057-22517

Westbound

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
05/24/22	0	45	3	0	0	0	0	0	0	0	0	0	0	48
01:00	0	12	2	0	0	0	0	0	0	0	0	0	0	14
02:00	0	11	3	0	0	0	0	0	1	0	0	0	0	15
03:00	0	38	10	0	0	0	0	0	0	0	0	0	0	48
04:00	0	121	32	0	0	0	0	0	**2**	0	0	0	0	155
05:00	3	367	98	1	2	1	0	0	0	0	0	0	0	472
06:00	3	917	171	4	**14**	0	0	2	1	0	0	0	0	1112
07:00	5	**1353**	**182**	**5**	13	0	0	**6**	1	0	0	0	0	**1565**
08:00	5	1009	145	1	12	3	0	2	0	0	0	0	0	1177
09:00	1	620	99	1	13	**4**	0	2	0	0	0	0	0	740
10:00	**7**	482	84	0	12	1	0	1	1	0	0	0	0	588
11:00	1	497	95	3	4	3	0	1	0	0	0	0	0	604
12 PM	**7**	544	87	**2**	**13**	1	0	0	0	0	0	0	0	654
13:00	3	528	92	2	6	**2**	0	**1**	0	0	0	0	0	634
14:00	1	625	94	2	4	0	0	1	0	0	0	0	0	727
15:00	4	628	88	2	3	1	0	1	0	0	0	0	0	727
16:00	1	764	**99**	1	2	1	0	0	1	0	0	0	0	869
17:00	3	**833**	77	0	5	2	0	0	0	0	0	0	0	**920**
18:00	4	571	48	0	1	0	0	0	0	0	0	0	0	624
19:00	1	394	27	0	2	0	0	0	**2**	0	0	0	0	426
20:00	1	357	34	0	1	0	0	0	0	0	0	0	0	393
21:00	1	267	30	0	1	0	0	0	0	0	0	0	0	299
22:00	0	184	10	0	2	0	0	0	0	0	0	0	0	196
23:00	1	90	8	0	0	0	0	0	0	0	0	0	0	99
Total	52	11257	1618	24	110	19	0	17	9	0	0	0	0	13106
Percent	0.4%	85.9%	12.3%	0.2%	0.8%	0.1%	0.0%	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%	
AM Peak	10:00	07:00	07:00	07:00	06:00	09:00		07:00	04:00					07:00
Vol.	7	1353	182	5	14	4		6	2					1565
PM Peak	12:00	17:00	16:00	12:00	12:00	13:00		13:00	19:00					17:00
Vol.	7	833	99	2	13	2		1	2					920
Grand Total	52	11257	1618	24	110	19	0	17	9	0	0	0	0	13106
Percent	0.4%	85.9%	12.3%	0.2%	0.8%	0.1%	0.0%	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%	

Counts Unlimited, Inc.

PO Box 1178
Corona, CA 92878
Phone: (951) 268-6268
email: counts@countsunlimited.com

City of Chino Hills
Chino Hills Parkway
E/ Carbon Canyon Road
24 Hour Directional Classification Count

CHH005
Site Code: 057-22517

Eastbound, Westbound

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
05/24/22	1	124	4	0	0	0	0	0	0	0	0	0	0	129
01:00	0	43	4	0	0	0	0	0	0	0	0	0	0	47
02:00	0	30	3	0	0	0	0	0	1	0	0	0	0	34
03:00	0	61	11	0	0	0	0	0	0	0	0	0	0	72
04:00	0	168	39	0	0	0	**1**	0	**2**	0	0	0	0	210
05:00	3	433	115	1	2	1	0	0	1	0	0	0	0	556
06:00	3	1098	201	**7**	14	0	0	2	2	0	0	0	0	1327
07:00	5	**1795**	**273**	6	18	3	0	**8**	2	0	0	0	0	**2110**
08:00	7	1592	222	3	16	4	0	4	0	0	0	0	0	1848
09:00	5	1070	167	1	18	**6**	1	3	1	0	0	0	0	1272
10:00	**9**	924	173	0	**23**	3	0	1	1	0	0	0	0	1134
11:00	4	1004	186	3	9	5	0	1	0	0	0	0	0	1212
12 PM	**14**	1101	182	2	15	3	0	0	0	0	0	0	0	1317
13:00	8	1155	221	**5**	**20**	5	0	**2**	2	0	0	0	0	1418
14:00	5	1455	258	5	8	**8**	0	2	0	0	0	0	0	1741
15:00	10	1936	297	4	18	6	**1**	2	0	0	0	0	0	2274
16:00	6	2128	**339**	2	12	1	0	0	2	0	0	0	0	2490
17:00	8	**2342**	296	0	8	2	0	1	0	0	0	0	0	**2657**
18:00	12	1933	172	0	8	1	0	0	2	0	0	0	0	2128
19:00	1	1096	98	0	2	1	0	0	**3**	0	0	0	0	1201
20:00	4	808	66	0	1	0	0	0	0	0	0	0	0	879
21:00	2	558	52	0	1	0	0	0	0	0	0	0	0	613
22:00	0	399	25	0	2	0	0	0	0	0	0	0	0	426
23:00	1	197	14	0	1	0	0	0	0	0	0	0	0	213
Total	108	23450	3418	39	196	49	3	26	19	0	0	0	0	27308
Percent	0.4%	85.9%	12.5%	0.1%	0.7%	0.2%	0.0%	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%	
AM Peak	10:00	07:00	07:00	06:00	10:00	09:00	04:00	07:00	04:00					07:00
Vol.	9	1795	273	7	23	6	1	8	2					2110
PM Peak	12:00	17:00	16:00	13:00	13:00	14:00	15:00	13:00	19:00					17:00
Vol.	14	2342	339	5	20	8	1	2	3					2657
Grand Total	108	23450	3418	39	196	49	3	26	19	0	0	0	0	27308
Percent	0.4%	85.9%	12.5%	0.1%	0.7%	0.2%	0.0%	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%	

Counts Unlimited, Inc.

PO Box 1178
Corona, CA 92878
Phone: (951) 268-6268
email: counts@countsunlimited.com

City of Chino Hills
Chino Hills Parkway
E/ Peyton Drive
24 Hour Directional Classification Count

CHH006
Site Code: 057-22517

Eastbound

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
05/24/22	0	59	3	0	0	0	0	0	0	0	0	0	0	62
01:00	0	27	1	0	0	0	0	0	0	0	0	0	0	28
02:00	0	16	0	0	0	0	0	0	0	0	0	0	0	16
03:00	0	32	0	0	0	0	0	0	0	0	0	0	0	32
04:00	0	77	6	0	1	0	0	0	0	0	0	0	0	84
05:00	0	121	22	0	1	0	0	0	**2**	0	0	0	0	146
06:00	0	252	53	2	1	0	0	0	1	0	0	0	0	309
07:00	0	**631**	80	**5**	8	0	0	1	1	0	0	0	0	**726**
08:00	2	618	83	0	5	1	0	**2**	0	0	0	0	0	711
09:00	**4**	477	69	0	9	2	0	1	2	0	0	0	0	564
10:00	2	479	99	0	**14**	**3**	0	0	1	0	0	0	0	598
11:00	2	513	**109**	1	5	1	0	0	1	0	0	0	0	632
12 PM	5	581	115	1	3	2	0	0	0	0	0	0	0	707
13:00	1	576	116	2	**20**	3	0	1	**3**	0	0	0	0	722
14:00	4	788	153	**6**	8	**7**	0	**2**	0	0	0	0	0	968
15:00	2	1047	186	5	15	6	0	1	0	0	0	0	0	1262
16:00	4	1155	**203**	0	14	0	0	2	1	0	0	0	0	1379
17:00	1	**1261**	185	0	4	0	0	2	0	0	0	0	0	**1453**
18:00	**6**	1022	105	0	4	1	0	2	1	0	0	0	0	1141
19:00	0	623	72	0	0	0	0	0	1	**2**	0	0	0	698
20:00	2	429	27	0	0	0	0	0	0	0	0	0	0	458
21:00	0	303	15	0	0	0	0	0	0	0	0	0	0	318
22:00	1	195	16	0	0	0	0	0	0	0	0	0	0	212
23:00	0	95	3	0	1	0	0	0	0	0	0	0	0	99
Total	36	11377	1721	22	113	26	0	14	14	2	0	0	0	13325
Percent	0.3%	85.4%	12.9%	0.2%	0.8%	0.2%	0.0%	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%	
AM Peak	09:00	07:00	11:00	07:00	10:00	10:00		08:00	05:00					07:00
Vol.	4	631	109	5	14	3		2	2					726
PM Peak	18:00	17:00	16:00	14:00	13:00	14:00		14:00	13:00	19:00				17:00
Vol.	6	1261	203	6	20	7		2	3	2				1453
Grand Total	36	11377	1721	22	113	26	0	14	14	2	0	0	0	13325
Percent	0.3%	85.4%	12.9%	0.2%	0.8%	0.2%	0.0%	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%	

Counts Unlimited, Inc.

PO Box 1178
Corona, CA 92878
Phone: (951) 268-6268
email: counts@countsunlimited.com

City of Chino Hills
Chino Hills Parkway
E/ Peyton Drive
24 Hour Directional Classification Count

CHH006
Site Code: 057-22517

Westbound

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
05/24/22	0	45	3	0	0	0	0	0	0	0	0	0	0	48
01:00	0	18	7	0	0	0	0	0	0	0	0	0	0	25
02:00	0	18	3	0	0	0	0	0	**1**	0	0	0	0	22
03:00	0	37	7	0	0	0	0	0	1	0	0	0	0	45
04:00	0	71	18	0	0	0	0	0	0	0	0	0	0	89
05:00	2	228	60	0	1	1	0	0	0	0	0	0	0	292
06:00	0	585	114	4	12	0	0	0	1	0	0	0	0	716
07:00	**3**	**1036**	**157**	**7**	13	0	0	2	0	0	0	0	0	**1218**
08:00	2	757	122	1	**15**	**2**	**1**	2	1	0	0	0	0	903
09:00	1	498	83	0	11	2	0	1	0	0	0	0	0	596
10:00	3	480	87	0	10	1	0	0	1	0	0	0	0	582
11:00	1	511	113	4	13	0	0	**3**	0	0	0	0	0	645
12 PM	**6**	569	94	3	10	1	0	1	**1**	0	0	0	0	685
13:00	1	556	107	**4**	**11**	**2**	0	**2**	0	0	0	0	0	683
14:00	1	696	106	2	6	0	0	0	0	0	0	0	0	811
15:00	4	648	98	1	2	0	0	1	0	0	0	0	0	754
16:00	1	800	**108**	0	4	1	0	0	1	0	0	0	0	915
17:00	4	**1013**	104	0	6	1	0	1	1	0	0	0	0	**1130**
18:00	4	653	66	0	2	0	0	0	1	0	0	0	0	726
19:00	1	454	53	0	2	0	0	0	1	0	0	0	0	511
20:00	0	371	40	0	1	0	0	0	0	0	0	0	0	412
21:00	1	341	25	0	2	0	0	0	0	0	0	0	0	369
22:00	1	219	12	0	2	0	0	0	0	0	0	0	0	234
23:00	0	118	6	0	0	0	0	0	0	0	0	0	0	124
Total	36	10722	1593	26	123	11	1	13	10	0	0	0	0	12535
Percent	0.3%	85.5%	12.7%	0.2%	1.0%	0.1%	0.0%	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%	
AM Peak	07:00	07:00	07:00	07:00	08:00	08:00	08:00	11:00	02:00					07:00
Vol.	3	1036	157	7	15	2	1	3	1					1218
PM Peak	12:00	17:00	16:00	13:00	13:00	13:00		13:00	12:00					17:00
Vol.	6	1013	108	4	11	2		2	1					1130
Grand Total	36	10722	1593	26	123	11	1	13	10	0	0	0	0	12535
Percent	0.3%	85.5%	12.7%	0.2%	1.0%	0.1%	0.0%	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%	

Counts Unlimited, Inc.

PO Box 1178
Corona, CA 92878
Phone: (951) 268-6268
email: counts@countsunlimited.com

City of Chino Hills
Chino Hills Parkway
E/ Peyton Drive
24 Hour Directional Classification Count

CHH006
Site Code: 057-22517

Eastbound, Westbound

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
05/24/22	0	104	6	0	0	0	0	0	0	0	0	0	0	110
01:00	0	45	8	0	0	0	0	0	0	0	0	0	0	53
02:00	0	34	3	0	0	0	0	0	1	0	0	0	0	38
03:00	0	69	7	0	0	0	0	0	1	0	0	0	0	77
04:00	0	148	24	0	1	0	0	0	0	0	0	0	0	173
05:00	2	349	82	0	2	1	0	0	**2**	0	0	0	0	438
06:00	0	837	167	6	13	0	0	0	2	0	0	0	0	1025
07:00	3	**1667**	**237**	**12**	21	0	0	3	1	0	0	0	0	**1944**
08:00	4	1375	205	1	20	3	**1**	**4**	1	0	0	0	0	1614
09:00	**5**	975	152	0	20	**4**	0	2	2	0	0	0	0	1160
10:00	5	959	186	0	**24**	4	0	0	2	0	0	0	0	1180
11:00	3	1024	222	5	18	1	0	3	1	0	0	0	0	1277
12 PM	**11**	1150	209	4	13	3	0	1	1	0	0	0	0	1392
13:00	2	1132	223	6	**31**	5	0	**3**	**3**	0	0	0	0	1405
14:00	5	1484	259	**8**	14	**7**	0	2	0	0	0	0	0	1779
15:00	6	1695	284	6	17	6	0	2	0	0	0	0	0	2016
16:00	5	1955	**311**	0	18	1	0	2	2	0	0	0	0	2294
17:00	5	**2274**	289	0	10	1	0	3	1	0	0	0	0	**2583**
18:00	10	1675	171	0	6	1	0	2	2	0	0	0	0	1867
19:00	1	1077	125	0	2	0	0	0	2	**2**	0	0	0	1209
20:00	2	800	67	0	1	0	0	0	0	0	0	0	0	870
21:00	1	644	40	0	2	0	0	0	0	0	0	0	0	687
22:00	2	414	28	0	2	0	0	0	0	0	0	0	0	446
23:00	0	213	9	0	1	0	0	0	0	0	0	0	0	223
Total	72	22099	3314	48	236	37	1	27	24	2	0	0	0	25860
Percent	0.3%	85.5%	12.8%	0.2%	0.9%	0.1%	0.0%	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%	
AM Peak	09:00	07:00	07:00	07:00	10:00	09:00	08:00	08:00	05:00					07:00
Vol.	5	1667	237	12	24	4	1	4	2					1944
PM Peak	12:00	17:00	16:00	14:00	13:00	14:00		13:00	13:00	19:00				17:00
Vol.	11	2274	311	8	31	7		3	3	2				2583
Grand Total	72	22099	3314	48	236	37	1	27	24	2	0	0	0	25860
Percent	0.3%	85.5%	12.8%	0.2%	0.9%	0.1%	0.0%	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%	

Counts Unlimited, Inc.

PO Box 1178
Corona, CA 92878
Phone: (951) 268-6268
email: counts@countsunlimited.com

City of Chino Hills
Peyton Drive
N/ Woodview Road
24 Hour Directional Classification Count

CHH007
Site Code: 057-22517

Northbound

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
05/24/22	0	3	0	0	0	0	0	0	0	0	0	0	0	3
01:00	0	3	2	0	0	0	0	0	0	0	0	0	0	5
02:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1
03:00	0	2	0	0	0	0	0	0	0	0	0	0	0	2
04:00	0	4	0	0	0	0	0	0	0	0	0	0	0	4
05:00	0	14	1	0	0	0	0	0	0	0	0	0	0	15
06:00	0	65	13	1	0	0	0	0	0	0	0	0	0	79
07:00	**1**	**295**	18	**3**	0	0	0	0	0	0	0	0	0	**317**
08:00	0	164	**21**	2	0	0	0	0	0	0	0	0	0	187
09:00	0	103	13	0	**2**	0	0	0	0	0	0	0	0	118
10:00	0	106	14	0	2	0	0	0	**1**	0	0	0	0	123
11:00	1	79	16	0	1	0	0	0	0	0	0	0	0	97
12 PM	0	95	19	1	1	**1**	0	0	0	0	0	0	0	117
13:00	**3**	119	13	1	1	0	0	0	0	0	0	0	0	137
14:00	0	**157**	**22**	**2**	0	0	0	**1**	0	0	0	0	0	**182**
15:00	0	119	13	0	**2**	0	0	0	0	0	0	0	0	134
16:00	0	109	16	0	0	0	0	0	0	0	0	0	0	125
17:00	0	108	17	0	0	0	0	0	0	0	0	0	0	125
18:00	0	77	10	0	0	0	0	0	0	0	0	0	0	87
19:00	0	77	10	0	1	0	0	0	0	0	0	0	0	88
20:00	0	54	9	0	0	0	0	0	0	0	0	0	0	63
21:00	0	65	8	0	0	0	0	0	0	0	0	0	0	73
22:00	0	26	2	0	0	0	0	0	0	0	0	0	0	28
23:00	0	12	2	0	0	0	0	0	0	0	0	0	0	14
Total	5	1857	239	10	10	1	0	1	1	0	0	0	0	2124
Percent	0.2%	87.4%	11.3%	0.5%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak	07:00	07:00	08:00	07:00	09:00				10:00					07:00
Vol.	1	295	21	3	2				1					317
PM Peak	13:00	14:00	14:00	14:00	15:00	12:00		14:00						14:00
Vol.	3	157	22	2	2	1		1						182
Grand Total	5	1857	239	10	10	1	0	1	1	0	0	0	0	2124
Percent	0.2%	87.4%	11.3%	0.5%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	

Counts Unlimited, Inc.

PO Box 1178
Corona, CA 92878
Phone: (951) 268-6268
email: counts@countsunlimited.com

City of Chino Hills
Peyton Drive
N/ Woodview Road
24 Hour Directional Classification Count

CHH007
Site Code: 057-22517

Southbound

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
05/24/22	0	9	0	0	0	0	0	0	0	0	0	0	0	9
01:00	0	4	0	0	0	0	0	0	0	0	0	0	0	4
02:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1
03:00	0	2	0	0	0	0	0	0	0	0	0	0	0	2
04:00	0	6	0	0	0	0	0	0	0	0	0	0	0	6
05:00	0	5	5	0	0	0	0	0	0	0	0	0	0	10
06:00	0	58	10	0	0	0	0	0	0	0	0	0	0	68
07:00	0	**193**	24	**1**	1	0	0	0	0	0	0	0	0	**219**
08:00	0	114	17	0	1	0	0	0	0	0	0	0	0	132
09:00	0	63	14	0	1	0	0	0	0	0	0	0	0	78
10:00	**1**	69	6	1	**4**	0	0	**1**	0	0	0	0	0	82
11:00	1	58	**29**	0	2	0	0	0	0	0	0	0	0	90
12 PM	0	167	10	1	0	0	**1**	0	0	0	0	0	0	179
13:00	**3**	92	18	**2**	0	0	0	0	0	0	0	0	0	115
14:00	0	151	19	1	2	**1**	0	0	0	0	0	0	0	174
15:00	0	158	20	2	**3**	0	0	0	0	0	0	0	0	183
16:00	1	162	**23**	0	0	0	0	0	0	0	0	0	0	186
17:00	0	**210**	18	0	0	0	0	0	0	0	0	0	0	**228**
18:00	0	165	15	0	1	0	0	0	0	0	0	0	0	181
19:00	0	93	8	0	0	0	0	0	0	0	0	0	0	101
20:00	1	81	4	0	0	0	0	0	0	0	0	0	0	86
21:00	0	70	3	0	0	0	0	0	0	0	0	0	0	73
22:00	0	41	3	0	0	0	0	0	0	0	0	0	0	44
23:00	0	14	3	0	0	0	0	0	0	0	0	0	0	17
Total	7	1986	249	8	15	1	1	1	0	0	0	0	0	2268
Percent	0.3%	87.6%	11.0%	0.4%	0.7%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak	10:00	07:00	11:00	07:00	10:00			10:00						07:00
Vol.	1	193	29	1	4			1						219
PM Peak	13:00	17:00	16:00	13:00	15:00	14:00	12:00							17:00
Vol.	3	210	23	2	3	1	1							228
Grand Total	7	1986	249	8	15	1	1	1	0	0	0	0	0	2268
Percent	0.3%	87.6%	11.0%	0.4%	0.7%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	

Counts Unlimited, Inc.

PO Box 1178
Corona, CA 92878
Phone: (951) 268-6268
email: counts@countsunlimited.com

City of Chino Hills
Peyton Drive
N/ Woodview Road
24 Hour Directional Classification Count
Northbound, Southbound

CHH007
Site Code: 057-22517

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
05/24/22	0	12	0	0	0	0	0	0	0	0	0	0	0	12
01:00	0	7	2	0	0	0	0	0	0	0	0	0	0	9
02:00	0	2	0	0	0	0	0	0	0	0	0	0	0	2
03:00	0	4	0	0	0	0	0	0	0	0	0	0	0	4
04:00	0	10	0	0	0	0	0	0	0	0	0	0	0	10
05:00	0	19	6	0	0	0	0	0	0	0	0	0	0	25
06:00	0	123	23	1	0	0	0	0	0	0	0	0	0	147
07:00	1	**488**	42	**4**	1	0	0	0	0	0	0	0	0	**536**
08:00	0	278	38	2	1	0	0	0	0	0	0	0	0	319
09:00	0	166	27	0	3	0	0	0	0	0	0	0	0	196
10:00	1	175	20	1	**6**	0	0	**1**	**1**	0	0	0	0	205
11:00	**2**	137	**45**	0	3	0	0	0	0	0	0	0	0	187
12 PM	0	262	29	2	1	**1**	**1**	0	0	0	0	0	0	296
13:00	**6**	211	31	**3**	1	0	0	0	0	0	0	0	0	252
14:00	0	308	**41**	3	2	1	0	**1**	0	0	0	0	0	**356**
15:00	0	277	33	2	**5**	0	0	0	0	0	0	0	0	317
16:00	1	271	39	0	0	0	0	0	0	0	0	0	0	311
17:00	0	**318**	35	0	0	0	0	0	0	0	0	0	0	353
18:00	0	242	25	0	1	0	0	0	0	0	0	0	0	268
19:00	0	170	18	0	1	0	0	0	0	0	0	0	0	189
20:00	1	135	13	0	0	0	0	0	0	0	0	0	0	149
21:00	0	135	11	0	0	0	0	0	0	0	0	0	0	146
22:00	0	67	5	0	0	0	0	0	0	0	0	0	0	72
23:00	0	26	5	0	0	0	0	0	0	0	0	0	0	31
Total	12	3843	488	18	25	2	1	2	1	0	0	0	0	4392
Percent	0.3%	87.5%	11.1%	0.4%	0.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak	11:00	07:00	11:00	07:00	10:00			10:00	10:00					07:00
Vol.	2	488	45	4	6			1	1					536
PM Peak	13:00	17:00	14:00	13:00	15:00	12:00	12:00	14:00						14:00
Vol.	6	318	41	3	5	1	1	1						356
Grand Total	12	3843	488	18	25	2	1	2	1	0	0	0	0	4392
Percent	0.3%	87.5%	11.1%	0.4%	0.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	

Counts Unlimited, Inc.

PO Box 1178
Corona, CA 92878
Phone: (951) 268-6268
email: counts@countsunlimited.com

City of Chino Hills
Woodview Road
E/ Peyton Drive
24 Hour Directional Classification Count

CHH008
Site Code: 057-22517

Eastbound

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
05/24/22	0	8	0	0	0	0	0	0	0	0	0	0	0	8
01:00	0	4	0	0	0	0	0	0	0	0	0	0	0	4
02:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1
03:00	0	4	0	0	0	**1**	0	0	0	0	0	0	0	5
04:00	0	9	0	0	0	0	0	0	0	0	0	0	0	9
05:00	0	6	5	0	0	0	0	0	0	0	0	0	0	11
06:00	0	59	9	0	0	0	0	0	0	0	0	0	0	68
07:00	0	**187**	13	**1**	1	0	0	0	0	0	0	0	0	**202**
08:00	0	103	13	0	0	0	0	0	0	0	0	0	0	116
09:00	0	67	16	0	0	0	0	0	0	0	0	0	0	83
10:00	0	59	15	1	**2**	0	0	**1**	0	0	0	0	0	78
11:00	0	53	**30**	0	2	0	0	0	0	0	0	0	0	85
12 PM	0	135	9	1	0	0	0	**1**	0	0	0	0	0	146
13:00	**3**	76	14	**2**	0	0	0	0	0	0	0	0	0	95
14:00	0	135	19	1	2	**1**	0	0	0	0	0	0	0	158
15:00	0	134	21	2	**4**	0	0	0	0	0	0	0	0	161
16:00	1	142	**24**	0	0	0	0	0	0	0	0	0	0	167
17:00	0	**166**	16	0	0	0	0	0	0	0	0	0	0	**182**
18:00	0	127	12	0	1	0	0	0	0	0	0	0	0	140
19:00	0	69	12	0	0	0	0	0	0	0	0	0	0	81
20:00	1	65	2	0	0	0	0	0	0	0	0	0	0	68
21:00	0	50	2	0	0	0	0	0	0	0	0	0	0	52
22:00	0	24	3	0	0	0	0	0	0	0	0	0	0	27
23:00	0	19	2	0	0	0	0	0	0	0	0	0	0	21
Total	5	1702	237	8	12	2	0	2	0	0	0	0	0	1968
Percent	0.3%	86.5%	12.0%	0.4%	0.6%	0.1%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak		07:00	11:00	07:00	10:00	03:00		10:00						07:00
Vol.		187	30	1	2	1		1						202
PM Peak	13:00	17:00	16:00	13:00	15:00	14:00		12:00						17:00
Vol.	3	166	24	2	4	1		1						182
Grand Total	5	1702	237	8	12	2	0	2	0	0	0	0	0	1968
Percent	0.3%	86.5%	12.0%	0.4%	0.6%	0.1%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	

Counts Unlimited, Inc.

PO Box 1178
Corona, CA 92878
Phone: (951) 268-6268
email: counts@countsunlimited.com

City of Chino Hills
Woodview Road
E/ Peyton Drive
24 Hour Directional Classification Count

CHH008
Site Code: 057-22517

Westbound

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
05/24/22	0	3	0	0	0	0	0	0	0	0	0	0	0	3
01:00	0	3	2	0	0	0	0	**1**	0	0	0	0	0	6
02:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:00	0	2	0	0	0	0	0	0	0	0	0	0	0	2
05:00	0	9	0	0	0	0	0	0	0	0	0	0	0	9
06:00	0	49	13	1	0	0	0	0	0	0	0	0	0	63
07:00	0	**261**	17	**3**	0	0	0	0	0	0	0	0	0	**281**
08:00	0	133	**21**	2	0	0	0	1	0	0	0	0	0	157
09:00	0	78	11	0	**2**	0	0	0	0	0	0	0	0	91
10:00	0	65	17	0	1	0	0	0	**1**	0	0	0	0	84
11:00	0	65	14	0	0	0	0	0	0	0	0	0	0	79
12 PM	0	96	**18**	1	0	0	0	0	0	0	0	0	0	115
13:00	**2**	106	10	1	**1**	0	0	**1**	0	0	0	0	0	121
14:00	1	**126**	16	**2**	1	0	0	0	0	0	0	0	0	**146**
15:00	0	103	9	0	1	0	0	0	0	0	0	0	0	113
16:00	1	98	14	0	0	0	0	0	0	0	0	0	0	113
17:00	0	106	16	0	0	0	0	0	0	0	0	0	0	122
18:00	0	63	7	0	0	0	0	0	0	0	0	0	0	70
19:00	0	61	6	0	1	0	0	0	0	0	0	0	0	68
20:00	0	43	10	0	0	0	0	0	0	0	0	0	0	53
21:00	0	64	7	0	0	0	0	0	0	0	0	0	0	71
22:00	0	29	2	0	0	0	0	0	0	0	0	0	0	31
23:00	0	13	2	0	0	0	0	0	0	0	0	0	0	15
Total	4	1577	212	10	7	0	0	3	1	0	0	0	0	1814
Percent	0.2%	86.9%	11.7%	0.6%	0.4%	0.0%	0.0%	0.2%	0.1%	0.0%	0.0%	0.0%	0.0%	
AM Peak		07:00	08:00	07:00	09:00			01:00	10:00					07:00
Vol.		261	21	3	2			1	1					281
PM Peak	13:00	14:00	12:00	14:00	13:00			13:00						14:00
Vol.	2	126	18	2	1			1						146
Grand Total	4	1577	212	10	7	0	0	3	1	0	0	0	0	1814
Percent	0.2%	86.9%	11.7%	0.6%	0.4%	0.0%	0.0%	0.2%	0.1%	0.0%	0.0%	0.0%	0.0%	

Counts Unlimited, Inc.

PO Box 1178
Corona, CA 92878
Phone: (951) 268-6268
email: counts@countsunlimited.com

City of Chino Hills
Woodview Road
E/ Peyton Drive
24 Hour Directional Classification Count

CHH008
Site Code: 057-22517

Eastbound, Westbound

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
05/24/22	0	11	0	0	0	0	0	0	0	0	0	0	0	11
01:00	0	7	2	0	0	0	0	**1**	0	0	0	0	0	10
02:00	0	2	0	0	0	0	0	0	0	0	0	0	0	2
03:00	0	4	0	0	0	**1**	0	0	0	0	0	0	0	5
04:00	0	11	0	0	0	0	0	0	0	0	0	0	0	11
05:00	0	15	5	0	0	0	0	0	0	0	0	0	0	20
06:00	0	108	22	1	0	0	0	0	0	0	0	0	0	131
07:00	0	**448**	30	**4**	1	0	0	0	0	0	0	0	0	**483**
08:00	0	236	34	2	0	0	0	1	0	0	0	0	0	273
09:00	0	145	27	0	2	0	0	0	0	0	0	0	0	174
10:00	0	124	32	1	**3**	0	0	1	**1**	0	0	0	0	162
11:00	0	118	**44**	0	2	0	0	0	0	0	0	0	0	164
12 PM	0	231	27	2	0	0	0	**1**	0	0	0	0	0	261
13:00	**5**	182	24	**3**	1	0	0	1	0	0	0	0	0	216
14:00	1	261	35	3	3	**1**	0	0	0	0	0	0	0	**304**
15:00	0	237	30	2	**5**	0	0	0	0	0	0	0	0	274
16:00	2	240	**38**	0	0	0	0	0	0	0	0	0	0	280
17:00	0	**272**	32	0	0	0	0	0	0	0	0	0	0	304
18:00	0	190	19	0	1	0	0	0	0	0	0	0	0	210
19:00	0	130	18	0	1	0	0	0	0	0	0	0	0	149
20:00	1	108	12	0	0	0	0	0	0	0	0	0	0	121
21:00	0	114	9	0	0	0	0	0	0	0	0	0	0	123
22:00	0	53	5	0	0	0	0	0	0	0	0	0	0	58
23:00	0	32	4	0	0	0	0	0	0	0	0	0	0	36
Total	9	3279	449	18	19	2	0	5	1	0	0	0	0	3782
Percent	0.2%	86.7%	11.9%	0.5%	0.5%	0.1%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak		07:00	11:00	07:00	10:00	03:00		01:00	10:00					07:00
Vol.		448	44	4	3	1		1	1					483
PM Peak	13:00	17:00	16:00	13:00	15:00	14:00		12:00						14:00
Vol.	5	272	38	3	5	1		1						304
Grand Total	9	3279	449	18	19	2	0	5	1	0	0	0	0	3782
Percent	0.2%	86.7%	11.9%	0.5%	0.5%	0.1%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	

Counts Unlimited, Inc.

PO Box 1178
Corona, CA 92878
Phone: (951) 268-6268
email: counts@countsunlimited.com

City of Chino Hills
Pipeline Avenue
S/ Woodview Road
24 Hour Directional Classification Count

CHH009
Site Code: 057-22517

Northbound

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
05/24/22	0	7	0	0	0	0	0	0	0	0	0	0	0	7
01:00	0	3	1	0	0	0	0	0	**1**	0	0	0	0	5
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:00	0	5	0	0	0	0	0	0	0	0	0	0	0	5
04:00	0	8	0	0	0	0	0	0	0	0	0	0	0	8
05:00	0	38	3	0	0	0	0	0	0	0	0	0	0	41
06:00	0	132	25	2	0	0	0	0	0	0	0	0	0	159
07:00	0	**482**	25	**5**	0	0	0	0	0	0	0	0	0	**512**
08:00	0	263	29	4	0	0	0	**1**	0	0	0	0	0	297
09:00	0	172	27	0	2	0	0	0	0	0	0	0	0	201
10:00	0	172	**31**	0	2	0	0	1	0	0	0	0	0	206
11:00	0	174	28	1	**3**	0	0	0	0	0	0	0	0	206
12 PM	1	252	35	1	**2**	0	0	0	0	0	0	0	0	291
13:00	**3**	207	**36**	3	1	0	0	**1**	0	0	0	0	0	251
14:00	2	280	24	**4**	1	0	0	0	0	0	0	0	0	**311**
15:00	0	215	24	0	1	0	0	0	0	0	0	0	0	240
16:00	2	240	32	0	0	0	0	0	0	0	0	0	0	274
17:00	0	**282**	27	0	0	0	0	0	0	0	0	0	0	309
18:00	2	178	17	0	0	0	0	0	0	0	0	0	0	197
19:00	1	114	11	0	1	0	0	0	0	0	0	0	0	127
20:00	0	108	12	0	0	0	0	0	0	0	0	0	0	120
21:00	0	185	8	0	0	0	0	0	0	0	0	0	0	193
22:00	0	62	3	0	0	0	0	0	0	0	0	0	0	65
23:00	0	19	1	0	0	0	0	0	0	0	0	0	0	20
Total	11	3598	399	20	13	0	0	3	1	0	0	0	0	4045
Percent	0.3%	88.9%	9.9%	0.5%	0.3%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak		07:00	10:00	07:00	11:00			08:00	01:00					07:00
Vol.		482	31	5	3			1	1					512
PM Peak	13:00	17:00	13:00	14:00	12:00			13:00						14:00
Vol.	3	282	36	4	2			1						311
Grand Total	11	3598	399	20	13	0	0	3	1	0	0	0	0	4045
Percent	0.3%	88.9%	9.9%	0.5%	0.3%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	

Counts Unlimited, Inc.

PO Box 1178
Corona, CA 92878
Phone: (951) 268-6268
email: counts@countsunlimited.com

City of Chino Hills
Pipeline Avenue
S/ Woodview Road
24 Hour Directional Classification Count

CHH009
Site Code: 057-22517

Southbound

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
05/24/22	0	16	0	0	0	0	0	0	0	0	0	0	0	16
01:00	0	12	1	0	0	0	0	0	0	0	0	0	0	13
02:00	0	7	1	0	0	0	0	0	0	0	0	0	0	8
03:00	0	8	1	0	0	0	0	**1**	0	0	0	0	0	10
04:00	0	10	1	0	0	0	0	0	0	0	0	0	0	11
05:00	0	17	7	0	0	0	0	0	0	0	0	0	0	24
06:00	0	134	16	1	0	0	0	0	0	0	0	0	0	151
07:00	0	**334**	38	2	1	0	0	0	0	0	0	0	0	**375**
08:00	0	176	21	0	**2**	0	0	0	0	0	0	0	0	199
09:00	0	156	19	0	2	0	0	0	0	0	0	0	0	177
10:00	0	145	16	**3**	2	0	0	0	0	0	0	0	0	166
11:00	**1**	143	**39**	0	2	**1**	0	0	0	0	0	0	0	186
12 PM	0	270	23	1	0	0	0	0	0	0	0	0	0	294
13:00	**3**	190	19	2	1	0	0	0	0	0	0	0	0	215
14:00	2	325	35	**5**	**2**	**1**	0	0	0	0	0	0	0	370
15:00	1	269	38	4	0	0	0	0	0	0	0	0	0	312
16:00	2	306	36	1	0	0	0	0	0	0	0	0	0	345
17:00	0	**399**	**41**	0	1	0	0	0	0	0	0	0	0	**441**
18:00	0	319	29	0	1	0	0	0	0	0	0	0	0	349
19:00	0	191	13	0	0	0	0	0	0	0	0	0	0	204
20:00	0	146	10	0	0	0	0	0	0	0	0	0	0	156
21:00	0	118	6	0	0	0	0	0	0	0	0	0	0	124
22:00	0	75	4	0	0	0	0	0	0	0	0	0	0	79
23:00	0	30	6	0	0	0	0	0	0	0	0	0	0	36
Total	9	3796	420	19	14	2	0	1	0	0	0	0	0	4261
Percent	0.2%	89.1%	9.9%	0.4%	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak	11:00	07:00	11:00	10:00	08:00	11:00		03:00						07:00
Vol.	1	334	39	3	2	1		1						375
PM Peak	13:00	17:00	17:00	14:00	14:00	14:00								17:00
Vol.	3	399	41	5	2	1								441
Grand Total	9	3796	420	19	14	2	0	1	0	0	0	0	0	4261
Percent	0.2%	89.1%	9.9%	0.4%	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	

Counts Unlimited, Inc.

PO Box 1178
Corona, CA 92878
Phone: (951) 268-6268
email: counts@countsunlimited.com

City of Chino Hills
Pipeline Avenue
S/ Woodview Road
24 Hour Directional Classification Count
Northbound, Southbound

CHH009
Site Code: 057-22517

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
05/24/22	0	23	0	0	0	0	0	0	0	0	0	0	0	23
01:00	0	15	2	0	0	0	0	0	**1**	0	0	0	0	18
02:00	0	7	1	0	0	0	0	0	0	0	0	0	0	8
03:00	0	13	1	0	0	0	0	**1**	0	0	0	0	0	15
04:00	0	18	1	0	0	0	0	0	0	0	0	0	0	19
05:00	0	55	10	0	0	0	0	0	0	0	0	0	0	65
06:00	0	266	41	3	0	0	0	0	0	0	0	0	0	310
07:00	0	**816**	63	**7**	1	0	0	0	0	0	0	0	0	**887**
08:00	0	439	50	4	2	0	0	1	0	0	0	0	0	496
09:00	0	328	46	0	4	0	0	0	0	0	0	0	0	378
10:00	0	317	47	3	4	0	0	1	0	0	0	0	0	372
11:00	**1**	317	**67**	1	**5**	**1**	0	0	0	0	0	0	0	392
12 PM	1	522	58	2	2	0	0	0	0	0	0	0	0	585
13:00	**6**	397	55	5	2	0	0	**1**	0	0	0	0	0	466
14:00	4	605	59	**9**	**3**	**1**	0	0	0	0	0	0	0	681
15:00	1	484	62	4	1	0	0	0	0	0	0	0	0	552
16:00	4	546	**68**	1	0	0	0	0	0	0	0	0	0	619
17:00	0	**681**	68	0	1	0	0	0	0	0	0	0	0	**750**
18:00	2	497	46	0	1	0	0	0	0	0	0	0	0	546
19:00	1	305	24	0	1	0	0	0	0	0	0	0	0	331
20:00	0	254	22	0	0	0	0	0	0	0	0	0	0	276
21:00	0	303	14	0	0	0	0	0	0	0	0	0	0	317
22:00	0	137	7	0	0	0	0	0	0	0	0	0	0	144
23:00	0	49	7	0	0	0	0	0	0	0	0	0	0	56
Total	20	7394	819	39	27	2	0	4	1	0	0	0	0	8306
Percent	0.2%	89.0%	9.9%	0.5%	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak	11:00	07:00	11:00	07:00	11:00	11:00		03:00	01:00					07:00
Vol.	1	816	67	7	5	1		1	1					887
PM Peak	13:00	17:00	16:00	14:00	14:00	14:00		13:00						17:00
Vol.	6	681	68	9	3	1		1						750
Grand Total	20	7394	819	39	27	2	0	4	1	0	0	0	0	8306
Percent	0.2%	89.0%	9.9%	0.5%	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	

Counts Unlimited, Inc.

PO Box 1178
Corona, CA 92878
Phone: (951) 268-6268
email: counts@countsunlimited.com

City of Chino Hills
Pipeline Avenue
N/ Soquel Canyon Parkway
24 Hour Directional Classification Count

CHH010
Site Code: 057-22517

Northbound

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
05/24/22	0	10	0	0	0	0	0	0	0	0	0	0	0	10
01:00	0	4	0	0	0	0	0	0	**1**	0	0	0	0	5
02:00	0	2	0	0	0	0	0	0	0	0	0	0	0	2
03:00	0	4	0	0	0	0	0	0	0	0	0	0	0	4
04:00	0	6	0	0	0	0	0	0	0	0	0	0	0	6
05:00	0	29	2	0	0	0	0	0	0	0	0	0	0	31
06:00	0	121	22	2	0	0	0	0	0	0	0	0	0	145
07:00	0	**451**	22	**5**	1	0	0	0	0	0	0	0	0	**479**
08:00	0	253	**29**	3	0	0	0	**1**	0	0	0	0	0	286
09:00	0	163	26	0	**2**	0	0	0	0	0	0	0	0	191
10:00	0	163	26	0	2	0	0	0	0	0	0	0	0	191
11:00	0	173	27	1	2	0	0	0	0	0	0	0	0	203
12 PM	1	245	35	1	**4**	0	0	0	0	0	0	0	0	286
13:00	**2**	205	**38**	2	3	0	0	**1**	0	0	0	0	0	251
14:00	2	268	32	**4**	2	0	0	0	0	0	0	0	0	308
15:00	0	215	25	0	1	0	0	0	0	0	0	0	0	241
16:00	2	223	35	0	0	0	0	0	0	0	0	0	0	260
17:00	1	**286**	31	0	0	0	0	0	0	0	0	0	0	**318**
18:00	2	176	21	0	2	0	0	0	0	0	0	0	0	201
19:00	0	117	11	0	1	0	0	0	0	0	0	0	0	129
20:00	0	110	8	0	0	0	0	0	0	0	0	0	0	118
21:00	0	199	3	0	0	0	0	0	0	0	0	0	0	202
22:00	0	63	1	0	0	0	0	0	0	0	0	0	0	64
23:00	0	16	1	0	0	0	0	0	0	0	0	0	0	17
Total	10	3502	395	18	20	0	0	2	1	0	0	0	0	3948
Percent	0.3%	88.7%	10.0%	0.5%	0.5%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak		07:00	08:00	07:00	09:00			08:00	01:00					07:00
Vol.		451	29	5	2			1	1					479
PM Peak	13:00	17:00	13:00	14:00	12:00			13:00						17:00
Vol.	2	286	38	4	4			1						318
Grand Total	10	3502	395	18	20	0	0	2	1	0	0	0	0	3948
Percent	0.3%	88.7%	10.0%	0.5%	0.5%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	

Counts Unlimited, Inc.

PO Box 1178
Corona, CA 92878
Phone: (951) 268-6268
email: counts@countsunlimited.com

City of Chino Hills
Pipeline Avenue
N/ Soquel Canyon Parkway
24 Hour Directional Classification Count

CHH010
Site Code: 057-22517

Southbound

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
05/24/22	0	18	0	0	0	0	0	0	0	0	0	0	0	18
01:00	0	8	1	0	0	0	0	0	0	0	0	0	0	9
02:00	0	8	0	0	0	0	0	**1**	0	0	0	0	0	9
03:00	0	11	0	0	0	0	0	0	0	0	0	0	0	11
04:00	0	14	0	0	0	0	0	0	0	0	0	0	0	14
05:00	0	26	4	0	0	0	0	0	0	0	0	0	0	30
06:00	0	138	19	1	0	0	0	0	0	0	0	0	0	158
07:00	0	**326**	32	1	1	0	0	0	0	0	0	0	0	**360**
08:00	0	175	21	0	**2**	0	0	0	0	0	0	0	0	198
09:00	0	147	20	0	2	0	0	0	0	0	0	0	0	169
10:00	0	141	17	**3**	2	0	0	0	0	0	0	0	0	163
11:00	**1**	135	**36**	0	2	**1**	0	0	0	0	0	0	0	175
12 PM	0	254	26	3	1	0	0	0	0	0	0	0	0	284
13:00	**3**	180	28	2	**3**	0	0	0	0	0	0	0	0	216
14:00	2	299	**46**	4	1	**1**	0	0	0	0	0	0	0	353
15:00	1	259	30	**5**	1	0	0	0	0	0	0	0	0	296
16:00	2	301	35	0	1	0	0	0	0	0	0	0	0	339
17:00	1	**380**	35	0	0	0	0	0	0	0	0	0	0	**416**
18:00	0	305	26	0	1	0	0	0	0	0	0	0	0	332
19:00	0	176	14	0	0	0	0	0	0	0	0	0	0	190
20:00	0	138	9	0	0	0	0	0	0	0	0	0	0	147
21:00	0	109	6	0	0	0	0	0	0	0	0	0	0	115
22:00	0	68	4	0	0	0	0	0	0	0	0	0	0	72
23:00	0	34	2	0	0	0	0	0	0	0	0	0	0	36
Total	10	3650	411	19	17	2	0	1	0	0	0	0	0	4110
Percent	0.2%	88.8%	10.0%	0.5%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak	11:00	07:00	11:00	10:00	08:00	11:00		02:00						07:00
Vol.	1	326	36	3	2	1		1						360
PM Peak	13:00	17:00	14:00	15:00	13:00	14:00								17:00
Vol.	3	380	46	5	3	1								416
Grand Total	10	3650	411	19	17	2	0	1	0	0	0	0	0	4110
Percent	0.2%	88.8%	10.0%	0.5%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	

Counts Unlimited, Inc.

PO Box 1178
Corona, CA 92878
Phone: (951) 268-6268
email: counts@countsunlimited.com

City of Chino Hills
Pipeline Avenue
N/ Soquel Canyon Parkway
24 Hour Directional Classification Count
Northbound, Southbound

CHH010
Site Code: 057-22517

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
05/24/22	0	28	0	0	0	0	0	0	0	0	0	0	0	28
01:00	0	12	1	0	0	0	0	0	**1**	0	0	0	0	14
02:00	0	10	0	0	0	0	0	**1**	0	0	0	0	0	11
03:00	0	15	0	0	0	0	0	0	0	0	0	0	0	15
04:00	0	20	0	0	0	0	0	0	0	0	0	0	0	20
05:00	0	55	6	0	0	0	0	0	0	0	0	0	0	61
06:00	0	259	41	3	0	0	0	0	0	0	0	0	0	303
07:00	0	**777**	54	**6**	2	0	0	0	0	0	0	0	0	**839**
08:00	0	428	50	3	2	0	0	1	0	0	0	0	0	484
09:00	0	310	46	0	**4**	0	0	0	0	0	0	0	0	360
10:00	0	304	43	3	4	0	0	0	0	0	0	0	0	354
11:00	**1**	308	**63**	1	4	**1**	0	0	0	0	0	0	0	378
12 PM	1	499	61	4	5	0	0	0	0	0	0	0	0	570
13:00	**5**	385	66	4	**6**	0	0	**1**	0	0	0	0	0	467
14:00	4	567	**78**	**8**	3	**1**	0	0	0	0	0	0	0	661
15:00	1	474	55	5	2	0	0	0	0	0	0	0	0	537
16:00	4	524	70	0	1	0	0	0	0	0	0	0	0	599
17:00	2	**666**	66	0	0	0	0	0	0	0	0	0	0	**734**
18:00	2	481	47	0	3	0	0	0	0	0	0	0	0	533
19:00	0	293	25	0	1	0	0	0	0	0	0	0	0	319
20:00	0	248	17	0	0	0	0	0	0	0	0	0	0	265
21:00	0	308	9	0	0	0	0	0	0	0	0	0	0	317
22:00	0	131	5	0	0	0	0	0	0	0	0	0	0	136
23:00	0	50	3	0	0	0	0	0	0	0	0	0	0	53
Total	20	7152	806	37	37	2	0	3	1	0	0	0	0	8058
Percent	0.2%	88.8%	10.0%	0.5%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak	11:00	07:00	11:00	07:00	09:00	11:00		02:00	01:00					07:00
Vol.	1	777	63	6	4	1		1	1					839
PM Peak	13:00	17:00	14:00	14:00	13:00	14:00		13:00						17:00
Vol.	5	666	78	8	6	1		1						734
Grand Total	20	7152	806	37	37	2	0	3	1	0	0	0	0	8058
Percent	0.2%	88.8%	10.0%	0.5%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	

APPENDIX C

EXISTING TRAFFIC CONDITIONS INTERSECTION LEVEL OF SERVICE CALCULATION WORKSHEETS

APPENDIX C-I

EXISTING TRAFFIC CONDITIONS

Intersection Level Of Service Report
Intersection 1: Peyton Drive at Chino Avenue

Control Type:	Signalized	Delay (sec / veh):	38.3
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.517

Intersection Setup

Name	Peyton Drive			Peyton Drive			Chino Avenue			Chino Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	0	1	0	0	1	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Peyton Drive			Peyton Drive			Chino Avenue			Chino Avenue		
Base Volume Input [veh/h]	160	478	121	147	399	201	225	324	122	109	316	117
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	160	478	121	147	399	201	225	324	122	109	316	117
Peak Hour Factor	0.8510	0.8510	0.8510	0.8510	0.8510	0.8510	0.8510	0.8510	0.8510	0.8510	0.8510	0.8510
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	47	140	36	43	117	59	66	95	36	32	93	34
Total Analysis Volume [veh/h]	188	562	142	173	469	236	264	381	143	128	371	137
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	1	6	0	5	2	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	12	35	0	12	35	0	34	39	0	34	39	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	24	0	0	24	0	0	28	0	0	28	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	C	L	C	C	L	C	R
C, Cycle Length [s]	120	120	120	120	120	120	120	120	120	120	120	120
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	8	60	60	8	60	60	21	25	25	11	15	15
g / C, Green / Cycle	0.07	0.50	0.50	0.07	0.50	0.50	0.17	0.21	0.21	0.09	0.13	0.13
(v / s)_i Volume / Saturation Flow Rate	0.06	0.13	0.13	0.05	0.13	0.13	0.16	0.10	0.09	0.08	0.10	0.08
s, saturation flow rate [veh/h]	3200	3600	1800	3200	3600	1800	1700	3600	1800	1700	3600	1800
c, Capacity [veh/h]	216	1798	899	216	1798	899	294	749	374	156	457	229
d1, Uniform Delay [s]	55.48	17.32	17.22	55.20	17.29	17.30	48.63	41.79	41.52	53.55	51.00	49.52
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.17	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	10.44	0.36	0.68	6.82	0.35	0.71	14.31	0.47	0.84	10.10	3.51	2.51
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.87	0.26	0.25	0.80	0.26	0.26	0.90	0.48	0.45	0.82	0.81	0.60
d, Delay for Lane Group [s/veh]	65.91	17.68	17.90	62.02	17.64	18.01	62.94	42.27	42.35	63.64	54.51	52.02
Lane Group LOS	E	B	B	E	B	B	E	D	D	E	D	D
Critical Lane Group	Yes	No	No	No	No	Yes	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	3.13	3.86	3.78	2.79	3.80	3.92	8.89	4.70	4.43	4.23	5.65	4.05
50th-Percentile Queue Length [ft/ln]	78.27	96.61	94.39	69.63	95.08	98.00	222.21	117.62	110.73	105.78	141.18	101.21
95th-Percentile Queue Length [veh/ln]	5.64	6.96	6.80	5.01	6.85	7.06	13.78	8.26	7.88	7.60	9.54	7.29
95th-Percentile Queue Length [ft/ln]	140.89	173.90	169.91	125.33	171.14	176.40	344.44	206.56	197.01	190.12	238.61	182.18

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	65.91	17.72	17.90	62.02	17.64	18.01	62.94	42.27	42.35	63.64	54.51	52.02
Movement LOS	E	B	B	E	B	B	E	D	D	E	D	D
d_A, Approach Delay [s/veh]	27.90			26.48			49.21			55.81		
Approach LOS	C			C			D			E		
d_I, Intersection Delay [s/veh]	38.33											
Intersection LOS	D											
Intersection V/C	0.517											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	49.52	49.52	49.52	49.52
l_p,int, Pedestrian LOS Score for Intersection	2.938	2.964	2.828	2.793
Crosswalk LOS	C	C	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	517	517	583	583
d_b, Bicycle Delay [s]	33.02	33.02	30.12	30.12
l_b,int, Bicycle LOS Score for Intersection	2.050	2.043	1.993	2.084
Bicycle LOS	B	B	A	B

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 2: Gateway Village/Boys Republic Drive at Grand Avenue

Control Type:	Signalized	Delay (sec / veh):	37.8
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.752

Intersection Setup

Name	Boys Republic Drive			Gateway Village			Grand Avenue			Grand Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	1	1	0	0	1	0	0	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			No		

Volumes

Name	Boys Republic Drive			Gateway Village			Grand Avenue			Grand Avenue		
Base Volume Input [veh/h]	11	26	254	79	31	31	49	553	4	431	825	73
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	11	26	254	79	31	31	49	553	4	431	825	73
Peak Hour Factor	0.8330	0.8330	0.8330	0.8330	0.8330	0.8330	0.8330	0.8330	0.8330	0.8330	0.8330	0.8330
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	8	76	24	9	9	15	166	1	129	248	22
Total Analysis Volume [veh/h]	13	31	305	95	37	37	59	664	5	517	990	88
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Split	Split	Split	Split	Split	Split	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	0	8	0	0	4	0	5	2	0	1	6	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	0	6	0	0	6	0	6	6	0	6	6	0
Maximum Green [s]	0	30	0	0	30	0	30	30	0	30	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	10	0	0	35	0	23	25	0	50	52	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	0	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	24	0	0	14	0	0	11	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall		No			No		No	No		No	No	
Maximum Recall		No			No		No	No		No	No	
Pedestrian Recall		No			No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	R	L	C	L	C	C	L	C	C
C, Cycle Length [s]	120	120	120	120	120	120	120	120	120	120
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	22	22	8	8	5	35	35	39	68	68
g / C, Green / Cycle	0.19	0.19	0.07	0.07	0.05	0.29	0.29	0.32	0.57	0.57
(v / s)_i Volume / Saturation Flow Rate	0.03	0.17	0.05	0.05	0.03	0.12	0.13	0.30	0.20	0.20
s, saturation flow rate [veh/h]	1700	1800	1700	1700	1700	3600	1800	1700	3600	1800
c, Capacity [veh/h]	317	336	119	119	78	1040	520	547	2033	1016
d1, Uniform Delay [s]	40.80	47.86	54.72	54.67	56.64	34.58	34.81	39.73	14.21	14.24
k, delay calibration	0.11	0.21	0.11	0.11	0.11	0.50	0.50	0.31	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.20	16.37	7.92	7.46	13.77	1.26	2.71	19.81	0.48	0.97
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.14	0.91	0.72	0.71	0.76	0.42	0.44	0.95	0.35	0.36
d, Delay for Lane Group [s/veh]	41.00	64.23	62.64	62.13	70.41	35.84	37.52	59.53	14.69	15.21
Lane Group LOS	D	E	E	E	E	D	D	E	B	B
Critical Lane Group	No	Yes	Yes	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	1.11	10.42	2.79	2.73	2.07	5.39	5.88	17.67	5.33	5.52
50th-Percentile Queue Length [ft/ln]	27.80	260.61	69.73	68.13	51.71	134.72	147.05	441.87	133.27	137.95
95th-Percentile Queue Length [veh/ln]	2.00	15.72	5.02	4.91	3.72	9.20	9.86	24.57	9.12	9.37
95th-Percentile Queue Length [ft/ln]	50.03	392.98	125.52	122.63	93.08	229.90	246.49	614.25	227.93	234.25

Movement, Approach, & Intersection Results

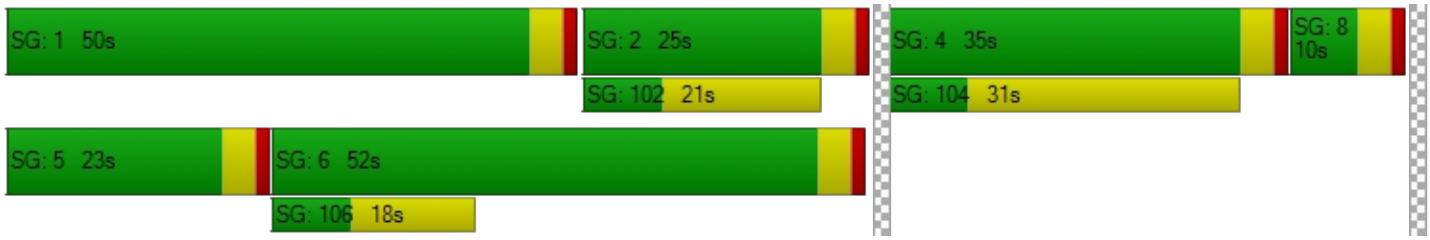
d_M, Delay for Movement [s/veh]	41.00	41.00	64.23	62.59	62.13	62.13	70.41	36.41	37.52	59.53	14.84	15.21
Movement LOS	D	D	E	E	E	E	E	D	D	E	B	B
d_A, Approach Delay [s/veh]	61.30			62.39			39.17			29.34		
Approach LOS	E			E			D			C		
d_I, Intersection Delay [s/veh]	37.75											
Intersection LOS	D											
Intersection V/C	0.752											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	0.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	49.54	49.54	49.54	0.00
l_p,int, Pedestrian LOS Score for Intersection	2.366	2.067	2.854	0.000
Crosswalk LOS	B	B	C	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	100	516	350	800
d_b, Bicycle Delay [s]	54.18	33.03	40.87	21.63
l_b,int, Bicycle LOS Score for Intersection	2.135	1.838	1.960	2.437
Bicycle LOS	B	A	A	B

Sequence

Ring 1	1	2	4	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 3: Peyton Drive at Eucalyptus Avenue

Control Type:	Signalized	Delay (sec / veh):	20.0
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.591

Intersection Setup

Name	Peyton Drive			Peyton Drive			Eucalyptus Avenue			Eucalyptus Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	1	1	0	0	1	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Peyton Drive			Peyton Drive			Eucalyptus Avenue			Eucalyptus Avenue		
Base Volume Input [veh/h]	10	552	105	175	460	224	247	114	10	124	107	255
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	10	552	105	175	460	224	247	114	10	124	107	255
Peak Hour Factor	0.6850	0.6850	0.6850	0.6850	0.6850	0.6850	0.6850	0.6850	0.6850	0.6850	0.6850	0.6850
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	4	201	38	64	168	82	90	42	4	45	39	93
Total Analysis Volume [veh/h]	15	806	153	255	672	327	361	166	15	181	156	372
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal Group	1	6	0	5	2	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	6	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	10	29	0	10	29	0	10	41	0	10	41	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	18	0	0	14	0	0	21	0	0	24	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		Yes	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	R	L	C	C	L	C	R
C, Cycle Length [s]	90	90	90	90	90	90	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	0.00	0.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	55	45	45	55	49	49	27	27	17	27	17	17
g / C, Green / Cycle	0.61	0.50	0.50	0.61	0.55	0.55	0.30	0.30	0.19	0.30	0.19	0.19
(v / s)_i Volume / Saturation Flow Rate	0.01	0.18	0.17	0.15	0.19	0.18	0.11	0.11	0.10	0.11	0.15	0.14
s, saturation flow rate [veh/h]	1700	3600	1800	1700	3600	1800	1700	1700	1800	1700	1800	1800
c, Capacity [veh/h]	967	1802	901	962	1965	983	388	516	336	368	338	338
d1, Uniform Delay [s]	6.83	13.70	13.63	7.97	11.44	11.37	24.80	24.80	33.14	24.81	35.06	34.63
k, delay calibration	0.11	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.01	0.56	1.07	0.67	0.48	0.91	3.98	1.87	1.34	1.02	4.61	3.39
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.02	0.36	0.35	0.27	0.34	0.33	0.47	0.35	0.54	0.49	0.81	0.75
d, Delay for Lane Group [s/veh]	6.84	14.26	14.70	8.64	11.91	12.28	28.78	26.67	34.48	25.83	39.67	38.01
Lane Group LOS	A	B	B	A	B	B	C	C	C	C	D	D
Critical Lane Group	No	Yes	No	Yes	No	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.10	3.90	3.92	2.22	3.62	3.63	3.39	3.23	3.64	3.08	6.06	5.49
50th-Percentile Queue Length [ft/ln]	2.62	97.60	98.06	55.51	90.53	90.65	84.81	80.79	91.01	76.93	151.60	137.27
95th-Percentile Queue Length [veh/ln]	0.19	7.03	7.06	4.00	6.52	6.53	6.11	5.82	6.55	5.54	10.10	9.33
95th-Percentile Queue Length [ft/ln]	4.71	175.68	176.50	99.91	162.96	163.17	152.66	145.42	163.81	138.48	252.56	233.35

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	6.84	14.35	14.70	8.64	11.91	12.28	27.72	34.48	34.48	25.83	39.67	38.52
Movement LOS	A	B	B	A	B	B	C	C	C	C	D	D
d_A, Approach Delay [s/veh]	14.29			11.34			29.98			35.54		
Approach LOS	B			B			C			D		
d_I, Intersection Delay [s/veh]	20.00											
Intersection LOS	C											
Intersection V/C	0.591											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	34.72	34.72	34.72	34.72
l_p,int, Pedestrian LOS Score for Intersection	3.009	3.293	2.396	2.740
Crosswalk LOS	C	C	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	555	555	821	821
d_b, Bicycle Delay [s]	23.51	23.51	15.64	15.64
l_b,int, Bicycle LOS Score for Intersection	2.095	2.594	2.007	2.729
Bicycle LOS	B	B	B	B

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 4: Rustic Drive/Carbon Canyon Road at Chino Hills Parkway

Control Type:	Signalized	Delay (sec / veh):	31.4
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.693

Intersection Setup

Name	Carbon Canyon Road			Rustic Drive			Chino Hills Parkway			Chino Hills Parkway		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	1	0	0	1	0	1	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			No		

Volumes

Name	Carbon Canyon Road			Rustic Drive			Chino Hills Parkway			Chino Hills Parkway		
Base Volume Input [veh/h]	186	0	278	3	0	0	14	278	270	1007	612	3
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	186	0	278	3	0	0	14	278	270	1007	612	3
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	51	0	76	1	0	0	4	76	73	274	166	1
Total Analysis Volume [veh/h]	202	0	302	3	0	0	15	302	293	1095	665	3
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	0	8	0	0	4	0	5	2	0	1	6	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	0	6	0	0	6	0	6	6	0	6	6	0
Maximum Green [s]	0	30	0	0	30	0	30	30	0	30	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	32	0	0	32	0	10	29	0	59	78	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	0	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	21	0	0	18	0	0	11	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall		No			No		No	No		No	No	
Maximum Recall		No			No		No	No		No	No	
Pedestrian Recall		No			No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	L	C	R	L	C	C
C, Cycle Length [s]	120	120	120	120	120	120	120	120	120	120	120
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	17	17	17	17	17	2	47	47	45	89	89
g / C, Green / Cycle	0.14	0.14	0.14	0.14	0.14	0.02	0.39	0.39	0.37	0.74	0.74
(v / s)_i Volume / Saturation Flow Rate	0.12	0.08	0.08	0.00	0.00	0.01	0.08	0.16	0.34	0.19	0.19
s, saturation flow rate [veh/h]	1700	1800	1800	1700	1800	1700	3600	1800	3200	1800	1800
c, Capacity [veh/h]	271	253	253	138	253	35	1399	699	1187	1330	1330
d1, Uniform Delay [s]	50.27	48.36	48.36	44.38	0.00	58.04	24.47	26.78	36.08	5.02	5.02
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	4.02	2.25	2.25	0.06	0.00	8.15	0.35	1.84	3.54	0.45	0.45
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.74	0.60	0.60	0.02	0.00	0.43	0.22	0.42	0.92	0.25	0.25
d, Delay for Lane Group [s/veh]	54.30	50.61	50.61	44.44	0.00	66.19	24.83	28.62	39.62	5.47	5.47
Lane Group LOS	D	D	D	D	A	E	C	C	D	A	A
Critical Lane Group	Yes	No	No	No	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	6.21	4.40	4.40	0.08	0.00	0.53	2.95	6.48	15.63	2.55	2.55
50th-Percentile Queue Length [ft/ln]	155.19	110.09	110.09	1.99	0.00	13.24	73.83	162.05	390.67	63.69	63.65
95th-Percentile Queue Length [veh/ln]	10.29	7.84	7.84	0.14	0.00	0.95	5.32	10.66	22.11	4.59	4.58
95th-Percentile Queue Length [ft/ln]	257.35	196.12	196.12	3.59	0.00	23.83	132.89	266.44	552.74	114.65	114.57

Movement, Approach, & Intersection Results

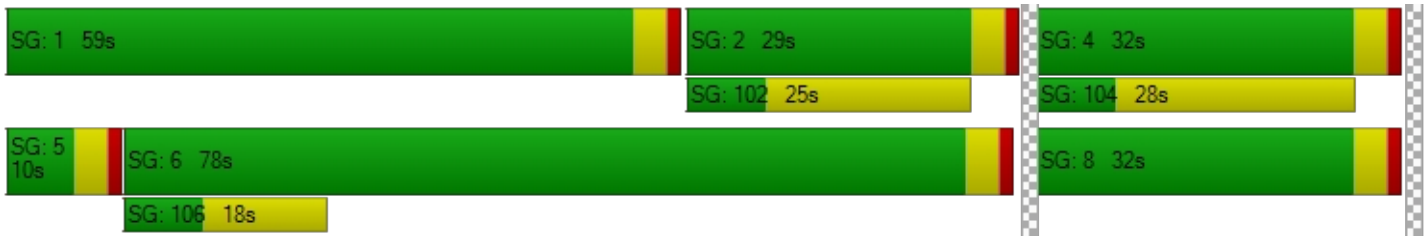
d_M, Delay for Movement [s/veh]	54.30	50.61	50.61	44.44	0.00	0.00	66.19	24.83	28.62	39.62	5.47	5.47
Movement LOS	D	D	D	D	A	A	E	C	C	D	A	A
d_A, Approach Delay [s/veh]	52.09			44.44			27.67			26.68		
Approach LOS	D			D			C			C		
d_I, Intersection Delay [s/veh]	31.35											
Intersection LOS	C											
Intersection V/C	0.693											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	0.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	49.49	49.49	49.49	0.00
l_p,int, Pedestrian LOS Score for Intersection	2.683	1.961	2.994	0.000
Crosswalk LOS	B	A	C	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	467	467	417	1234
d_b, Bicycle Delay [s]	35.25	35.25	37.59	8.81
l_b,int, Bicycle LOS Score for Intersection	2.391	1.565	2.063	3.014
Bicycle LOS	B	A	B	C

Sequence

Ring 1	1	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 5: Peyton Drive at Chino Hills Parkway

Control Type:	Signalized	Delay (sec / veh):	33.6
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.716

Intersection Setup

Name	Peyton Drive			Peyton Drive			Chino Hills Parkway			Chino Hills Parkway		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	1	1	0	0	1	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Peyton Drive			Peyton Drive			Chino Hills Parkway			Chino Hills Parkway		
Base Volume Input [veh/h]	423	347	261	144	188	246	129	359	95	179	874	215
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	423	347	261	144	188	246	129	359	95	179	874	215
Peak Hour Factor	0.9130	0.9130	0.9130	0.9130	0.9130	0.9130	0.9130	0.9130	0.9130	0.9130	0.9130	0.9130
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	116	95	71	39	51	67	35	98	26	49	239	59
Total Analysis Volume [veh/h]	463	380	286	158	206	269	141	393	104	196	957	235
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Overlap	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	3	8	0	7	4	4	5	2	0	1	6	0
Auxiliary Signal Groups						4,5						
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	6	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	30	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	1.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	25	42	0	15	32	32	10	32	0	11	33	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	7	0	7	0	0	7	0
Pedestrian Clearance [s]	0	24	0	0	21	21	0	21	0	0	21	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No	No	No	No		No	No	
Maximum Recall	No	No		No	No	No	No	No		No	No	
Pedestrian Recall	No	No		No	No	No	No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	R	L	C	C	L	C	R
C, Cycle Length [s]	100	100	100	100	100	100	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	17	23	23	11	17	27	6	43	43	7	44	44
g / C, Green / Cycle	0.17	0.23	0.23	0.11	0.17	0.27	0.06	0.43	0.43	0.07	0.44	0.44
(v / s)_i Volume / Saturation Flow Rate	0.14	0.20	0.17	0.09	0.06	0.15	0.04	0.14	0.13	0.06	0.27	0.13
s, saturation flow rate [veh/h]	3200	1800	1800	1700	3600	1800	3200	1800	1800	3200	3600	1800
c, Capacity [veh/h]	539	411	411	188	613	488	195	775	775	227	1586	793
d1, Uniform Delay [s]	40.47	37.21	35.98	43.67	36.56	31.27	46.20	18.94	18.74	46.05	21.35	18.03
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	4.10	5.76	2.78	9.62	0.32	0.97	5.04	1.15	1.04	9.52	1.71	0.95
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.86	0.87	0.75	0.84	0.34	0.55	0.72	0.33	0.31	0.87	0.60	0.30
d, Delay for Lane Group [s/veh]	44.57	42.97	38.75	53.29	36.88	32.25	51.23	20.08	19.78	55.57	23.06	18.98
Lane Group LOS	D	D	D	D	D	C	D	C	B	E	C	B
Critical Lane Group	No	Yes	No	Yes	No	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	5.79	8.95	7.23	4.31	2.23	5.63	1.85	4.11	3.81	2.70	8.62	3.63
50th-Percentile Queue Length [ft/ln]	144.64	223.69	180.77	107.70	55.82	140.84	46.24	102.81	95.21	67.40	215.39	90.67
95th-Percentile Queue Length [veh/ln]	9.73	13.85	11.64	7.71	4.02	9.53	3.33	7.40	6.86	4.85	13.43	6.53
95th-Percentile Queue Length [ft/ln]	243.25	346.33	291.02	192.80	100.47	238.15	83.24	185.05	171.38	121.32	335.74	163.20

Movement, Approach, & Intersection Results

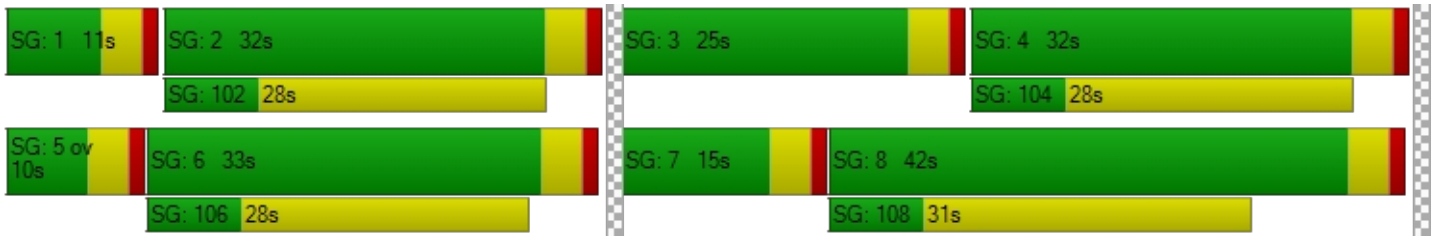
d_M, Delay for Movement [s/veh]	44.57	42.72	38.75	53.29	36.88	32.25	51.23	19.98	19.78	55.57	23.06	18.98
Movement LOS	D	D	D	D	D	C	D	B	B	E	C	B
d_A, Approach Delay [s/veh]	42.47			39.00			26.86			26.96		
Approach LOS	D			D			C			C		
d_I, Intersection Delay [s/veh]	33.58											
Intersection LOS	C											
Intersection V/C	0.716											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	39.64	39.64	39.64	39.64
l_p,int, Pedestrian LOS Score for Intersection	2.723	2.683	2.836	2.909
Crosswalk LOS	B	B	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	759	560	560	580
d_b, Bicycle Delay [s]	19.25	25.95	25.95	25.24
l_b,int, Bicycle LOS Score for Intersection	2.491	2.082	2.086	2.705
Bicycle LOS	B	B	B	B

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 6: Peyton Drive at Woodview Road

Control Type:	All-way stop	Delay (sec / veh):	14.0
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.596

Intersection Setup

Name	Peyton Drive		Woodview Road		Woodview Road	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	1	1	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	45.00		40.00		35.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

Volumes

Name	Peyton Drive		Woodview Road		Woodview Road	
Base Volume Input [veh/h]	182	42	57	24	21	268
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	182	42	57	24	21	268
Peak Hour Factor	0.6750	0.6750	0.6750	0.6750	0.6750	0.6750
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	67	16	21	9	8	99
Total Analysis Volume [veh/h]	270	62	84	36	31	397
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	557	685	542	587	718
Degree of Utilization, x	0.48	0.09	0.15	0.06	0.60

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	2.63	0.30	0.54	0.20	3.99
95th-Percentile Queue Length [ft]	65.78	7.44	13.62	4.89	99.85
Approach Delay [s/veh]	13.87		10.16		15.15
Approach LOS	B		B		C
Intersection Delay [s/veh]	13.99				
Intersection LOS	B				

Intersection Level Of Service Report
Intersection 7: Pipeline Avenue at Woodview Road

Control Type:	Two-way stop	Delay (sec / veh):	49.5
Analysis Method:	HCM 7th Edition	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.209

Intersection Setup

Name	Pipeline Avenue		Pipeline Avenue		Woodview Road	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	40.00		30.00		35.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name	Pipeline Avenue		Pipeline Avenue		Woodview Road	
Base Volume Input [veh/h]	275	251	184	15	15	201
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	275	251	184	15	15	201
Peak Hour Factor	0.7200	0.7200	0.7200	0.7200	0.7200	0.7200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	95	87	64	5	5	70
Total Analysis Volume [veh/h]	382	349	256	21	21	279
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.30	0.00	0.00	0.00	0.21	0.36
d_M, Delay for Movement [s/veh]	8.34	0.00	0.00	0.00	49.50	18.35
Movement LOS	A	A	A	A	E	C
95th-Percentile Queue Length [veh/ln]	0.80	0.80	0.00	0.00	3.54	3.54
95th-Percentile Queue Length [ft/ln]	20.11	20.11	0.00	0.00	88.44	88.44
d_A, Approach Delay [s/veh]	4.36		0.00		20.53	
Approach LOS	A		A		C	
d_I, Intersection Delay [s/veh]	7.14					
Intersection LOS	E					

Intersection Level Of Service Report
Intersection 8: Pipeline Avenue at Soquel Canyon Parkway

Control Type:	All-way stop	Delay (sec / veh):	74.4
Analysis Method:	HCM 7th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.115

Intersection Setup

Name	Pipeline Avenue		Soquel Canyon Parkway		Soquel Canyon Parkway	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	1	0	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	40.00		45.00		50.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		No	

Volumes

Name	Pipeline Avenue		Soquel Canyon Parkway		Soquel Canyon Parkway	
Base Volume Input [veh/h]	367	18	26	38	24	465
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	367	18	26	38	24	465
Peak Hour Factor	0.7250	0.7250	0.7250	0.7250	0.7250	0.7250
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	127	6	9	13	8	160
Total Analysis Volume [veh/h]	506	25	36	52	33	641
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	537	437	467	467	467	514	514	641
Degree of Utilization, x	0.99	0.08	0.04	0.04	0.04	0.03	0.03	1.12

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	13.74	0.27	0.12	0.12	0.12	0.10	0.10	20.19
95th-Percentile Queue Length [ft]	343.51	6.68	2.89	2.89	2.89	2.49	2.49	504.84
Approach Delay [s/veh]	61.86	11.10				92.48		
Approach LOS	F	B				F		
Intersection Delay [s/veh]	74.36							
Intersection LOS	F							

Intersection Level Of Service Report

Intersection 9: Soquel Canyon Parkway at Los Serranos Country Club Drive/Butterfield Ranch Road

Control Type:	Signalized	Delay (sec / veh):	35.6
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.568

Intersection Setup

Name	Soquel Canyon Parkway			Soquel Canyon Parkway			Lo Se			Butterfield Ranch Road		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	0	1	0	0	1	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Soquel Canyon Parkway			Soquel Canyon Parkway			Lo Se			Butterfield Ranch Road		
Base Volume Input [veh/h]	12	542	92	88	262	223	295	111	17	235	208	428
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	12	542	92	88	262	223	295	111	17	235	208	428
Peak Hour Factor	0.7170	0.7170	0.7170	0.7170	0.7170	0.7170	0.7170	0.7170	0.7170	0.7170	0.7170	0.7170
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	4	189	32	31	91	78	103	39	6	82	73	149
Total Analysis Volume [veh/h]	17	756	128	123	365	311	411	155	24	328	290	597
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Overlap
Signal Group	1	6	0	5	2	0	3	8	0	7	4	4
Auxiliary Signal Groups												4,5
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	6
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	30
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	3.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	1.0
Split [s]	17	39	0	10	32	0	32	39	0	32	39	39
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	3.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	7
Pedestrian Clearance [s]	0	28	0	0	18	0	0	28	0	0	28	28
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	2.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	2.0
Minimum Recall	No	No		No	No		No	No		No	No	No
Maximum Recall	No	No		No	No		No	No		No	No	No
Pedestrian Recall	No	No		No	No		No	No		No	No	No
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	C	L	C	C	L	C	R
C, Cycle Length [s]	120	120	120	120	120	120	120	120	120	120	120	120
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	0.00
g_i, Effective Green Time [s]	3	57	57	6	60	60	18	26	26	15	23	33
g / C, Green / Cycle	0.02	0.47	0.47	0.05	0.50	0.50	0.15	0.22	0.22	0.12	0.19	0.28
(v / s)_i Volume / Saturation Flow Rate	0.01	0.16	0.16	0.04	0.10	0.17	0.13	0.05	0.05	0.10	0.16	0.17
s, saturation flow rate [veh/h]	1700	3600	1800	3200	3600	1800	3200	1800	1800	3200	1800	3600
c, Capacity [veh/h]	38	1702	851	162	1804	902	481	395	395	396	347	997
d1, Uniform Delay [s]	57.93	19.97	19.91	56.25	16.63	18.07	49.74	38.54	38.46	51.35	46.61	37.62
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	7.82	0.56	1.10	7.02	0.25	1.05	4.47	0.30	0.28	4.46	5.29	0.58
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.44	0.35	0.34	0.76	0.20	0.34	0.86	0.23	0.22	0.83	0.84	0.60
d, Delay for Lane Group [s/veh]	65.75	20.53	21.01	63.28	16.89	19.12	54.20	38.84	38.74	55.80	51.90	38.20
Lane Group LOS	E	C	C	E	B	B	D	D	D	E	D	D
Critical Lane Group	No	Yes	No	Yes	No	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.59	5.33	5.37	2.00	2.85	5.42	6.30	2.26	2.17	5.06	8.82	7.68
50th-Percentile Queue Length [ft/ln]	14.84	133.32	134.21	49.97	71.28	135.58	157.50	56.47	54.13	126.44	220.43	192.01
95th-Percentile Queue Length [veh/ln]	1.07	9.12	9.17	3.60	5.13	9.24	10.42	4.07	3.90	8.75	13.69	12.23
95th-Percentile Queue Length [ft/ln]	26.72	228.00	229.20	89.95	128.31	231.06	260.41	101.64	97.44	218.65	342.18	305.64

Movement, Approach, & Intersection Results

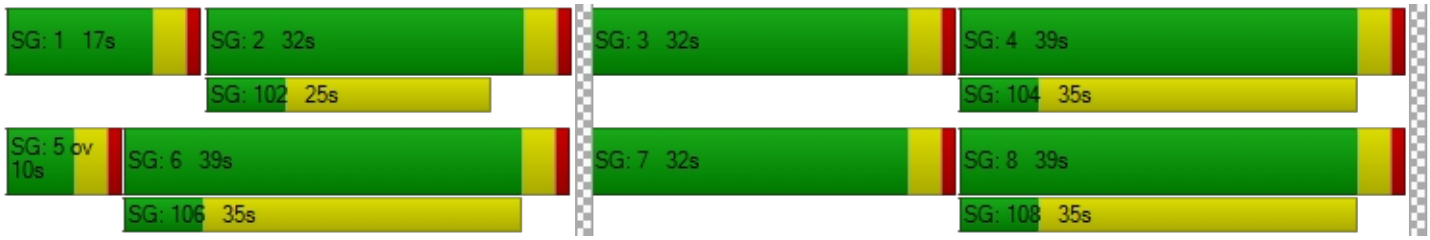
d_M, Delay for Movement [s/veh]	65.75	20.64	21.01	63.28	16.89	19.12	54.20	38.80	38.74	55.80	51.90	38.20
Movement LOS	E	C	C	E	B	B	D	D	D	E	D	D
d_A, Approach Delay [s/veh]	21.54			24.90			49.53			46.22		
Approach LOS	C			C			D			D		
d_I, Intersection Delay [s/veh]	35.57											
Intersection LOS	D											
Intersection V/C	0.568											

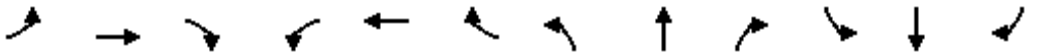
Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	49.52	49.52	49.52	49.52
l_p,int, Pedestrian LOS Score for Intersection	2.833	3.052	2.549	2.937
Crosswalk LOS	C	C	B	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	583	467	583	583
d_b, Bicycle Delay [s]	30.12	35.28	30.12	30.12
l_b,int, Bicycle LOS Score for Intersection	2.055	1.999	2.046	3.564
Bicycle LOS	B	A	B	D

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



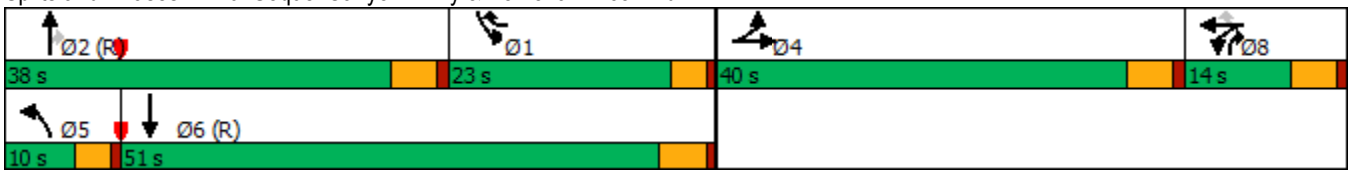


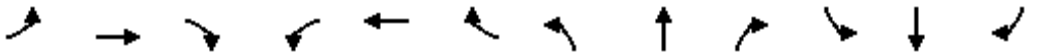
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	29	79	6	122	3	386	29	998	313	420	443	53
Future Volume (vph)	29	79	6	122	3	386	29	998	313	420	443	53
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	0.95	0.91	0.95	1.00	0.86	0.86	0.97	0.91	0.91
Frt		0.990			0.862	0.850		0.995	0.850		0.984	
Flt Protected	0.950			0.950	0.997		0.950			0.950		
Satd. Flow (prot)	1770	1844	0	1681	1457	1504	1770	4782	1362	3433	5004	0
Flt Permitted	0.950			0.950	0.997		0.950			0.950		
Satd. Flow (perm)	1770	1844	0	1681	1457	1504	1770	4782	1362	3433	5004	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3			285	309		4	433		22	
Link Speed (mph)		25			25			50			50	
Link Distance (ft)		560			625			594			526	
Travel Time (s)		15.3			17.0			8.1			7.2	
Peak Hour Factor	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65
Adj. Flow (vph)	45	122	9	188	5	594	45	1535	482	646	682	82
Shared Lane Traffic (%)				10%		48%			10%			
Lane Group Flow (vph)	45	131	0	169	309	309	45	1583	434	646	764	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2	1	1	2	1	1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100		20	100	20	20	100	20	20	100	
Trailing Detector (ft)	0	0		0	0	0	0	0	0	0	0	
Detector 1 Position(ft)	0	0		0	0	0	0	0	0	0	0	
Detector 1 Size(ft)	20	6		20	6	20	20	6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Split	NA		Split	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	
Protected Phases	4	4		8	8	1	5	2	8	1	6	
Permitted Phases						8			2			
Detector Phase	4	4		8	8	1	5	2	8	1	6	
Switch Phase												
Minimum Initial (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Split (s)	40.0	40.0		11.0	11.0	10.0	10.0	30.0	11.0	10.0	23.0	
Total Split (s)	40.0	40.0		14.0	14.0	23.0	10.0	38.0	14.0	23.0	51.0	
Total Split (%)	34.8%	34.8%		12.2%	12.2%	20.0%	8.7%	33.0%	12.2%	20.0%	44.3%	
Maximum Green (s)	35.0	35.0		9.0	9.0	19.0	6.0	33.0	9.0	19.0	46.0	
Yellow Time (s)	4.0	4.0		4.0	4.0	3.0	3.0	4.0	4.0	3.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0	4.0	4.0	5.0	5.0	4.0	5.0	
Lead/Lag						Lag	Lead	Lead		Lag	Lag	
Lead-Lag Optimize?						Yes	Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	None		None	None	None	None	C-Max	None	None	C-Max	
Walk Time (s)	7.0	7.0						7.0			7.0	
Flash Dont Walk (s)	28.0	28.0						18.0			11.0	
Pedestrian Calls (#/hr)	5	5						5			5	
Act Effct Green (s)	16.7	16.7		22.7	22.7	42.7	7.1	37.6	65.3	19.0	51.5	
Actuated g/C Ratio	0.15	0.15		0.20	0.20	0.37	0.06	0.33	0.57	0.17	0.45	
v/c Ratio	0.18	0.49		0.51	0.60	0.41	0.42	1.01	0.45	1.14	0.34	
Control Delay	40.5	48.0		49.4	12.8	3.5	63.9	64.4	3.5	126.0	21.5	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	40.5	48.0		49.4	12.8	3.5	63.9	64.4	3.5	126.0	21.5	
LOS	D	D		D	B	A	E	E	A	F	C	
Approach Delay		46.0			17.0			51.5			69.4	
Approach LOS		D			B			D			E	

Intersection Summary			
Area Type:	Other		
Cycle Length: 115			
Actuated Cycle Length: 115			
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green			
Natural Cycle: 115			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.14			
Intersection Signal Delay: 50.9		Intersection LOS: D	
Intersection Capacity Utilization 61.8%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 10: Soquel Canyon Pkwy & Pomona Rincon Rd





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	29	79	6	122	3	386	29	998	313	420	443	53
Future Volume (veh/h)	29	79	6	122	3	386	29	998	313	420	443	53
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	45	122	9	127	0	663	45	1535	482	646	682	82
Peak Hour Factor	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	167	161	12	139	0	1412	71	1610	579	1269	2881	343
Arrive On Green	0.09	0.09	0.09	0.08	0.00	0.08	0.04	0.29	0.29	0.37	0.62	0.62
Sat Flow, veh/h	1781	1721	127	1781	0	3170	1781	5611	1585	3456	4624	551
Grp Volume(v), veh/h	45	0	131	127	0	663	45	1535	482	646	500	264
Grp Sat Flow(s),veh/h/ln	1781	0	1848	1781	0	1585	1781	1870	1585	1728	1702	1771
Q Serve(g_s), s	2.7	0.0	8.0	8.1	0.0	0.0	2.9	30.9	31.9	16.7	7.5	7.6
Cycle Q Clear(g_c), s	2.7	0.0	8.0	8.1	0.0	0.0	2.9	30.9	31.9	16.7	7.5	7.6
Prop In Lane	1.00		0.07	1.00		1.00	1.00		1.00	1.00		0.31
Lane Grp Cap(c), veh/h	167	0	173	139	0	1412	71	1610	579	1269	2121	1104
V/C Ratio(X)	0.27	0.00	0.76	0.91	0.00	0.47	0.64	0.95	0.83	0.51	0.24	0.24
Avail Cap(c_a), veh/h	542	0	562	139	0	1412	93	1610	579	1269	2121	1104
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	48.5	0.0	50.8	52.6	0.0	22.4	54.4	40.2	33.3	28.3	9.6	9.6
Incr Delay (d2), s/veh	0.9	0.0	6.6	50.4	0.0	0.2	9.1	13.8	13.2	0.3	0.3	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	0.0	4.0	5.6	0.0	6.4	1.4	15.4	15.3	6.6	2.5	2.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	49.3	0.0	57.5	103.0	0.0	22.6	63.4	54.0	46.5	28.7	9.8	10.1
LnGrp LOS	D	A	E	F	A	C	E	D	D	C	A	B
Approach Vol, veh/h		176			790			2062			1410	
Approach Delay, s/veh		55.4			35.5			52.5			18.5	
Approach LOS		E			D			D			B	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	47.2	38.0		15.8	8.6	76.7		14.0				
Change Period (Y+Rc), s	5.0	* 5		5.0	4.0	5.0		5.0				
Max Green Setting (Gmax), s	19.0	* 33		35.0	6.0	46.0		9.0				
Max Q Clear Time (g_c+I1), s	18.7	33.9		10.0	4.9	9.6		10.1				
Green Ext Time (p_c), s	0.1	0.0		0.9	0.0	4.8		0.0				

Intersection Summary			
HCM 6th Ctrl Delay		38.8	
HCM 6th LOS		D	

Notes

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection Level Of Service Report
Intersection 11: Peyton Drive at Grand Avenue

Control Type:	Signalized	Delay (sec / veh):	33.1
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.622

Intersection Setup

Name	Peyton Drive			Peyton Drive			Grand Avenue			Grand Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	1	0	0	1	0	1	1	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Peyton Drive			Peyton Drive			Grand Avenue			Grand Avenue		
Base Volume Input [veh/h]	204	553	116	117	655	230	199	441	241	188	651	73
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	204	553	116	117	655	230	199	441	241	188	651	73
Peak Hour Factor	0.9010	0.9010	0.9010	0.9010	0.9010	0.9010	0.9010	0.9010	0.9010	0.9010	0.9010	0.9010
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	57	153	32	32	182	64	55	122	67	52	181	20
Total Analysis Volume [veh/h]	226	614	129	130	727	255	221	489	267	209	723	81
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	105
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	1	6	0	5	2	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	14	39	0	10	35	0	13	43	0	13	43	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	28	0	0	24	0	0	31	0	0	28	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	C	L	C	R	L	C	R
C, Cycle Length [s]	105	105	105	105	105	105	105	105	105	105	105	105
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	9	50	50	6	46	46	9	25	25	9	24	24
g / C, Green / Cycle	0.09	0.47	0.47	0.06	0.44	0.44	0.09	0.23	0.23	0.08	0.23	0.23
(v / s)_i Volume / Saturation Flow Rate	0.07	0.11	0.07	0.04	0.19	0.17	0.07	0.14	0.15	0.07	0.20	0.05
s, saturation flow rate [veh/h]	3200	5400	1800	3200	3600	1800	3200	3600	1800	3200	3600	1800
c, Capacity [veh/h]	286	2548	849	186	1585	793	276	843	421	269	834	417
d1, Uniform Delay [s]	46.89	16.54	15.79	48.62	20.24	19.89	47.13	35.68	36.20	47.19	38.83	32.50
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	4.84	0.22	0.38	4.74	0.83	1.45	5.29	0.64	1.58	4.85	2.90	0.22
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.79	0.24	0.15	0.70	0.42	0.39	0.80	0.58	0.63	0.78	0.87	0.19
d, Delay for Lane Group [s/veh]	51.73	16.77	16.17	53.36	21.07	21.35	52.42	36.32	37.79	52.04	41.74	32.72
Lane Group LOS	D	B	B	D	C	C	D	D	D	D	D	C
Critical Lane Group	Yes	No	No	No	Yes	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	3.07	2.94	1.83	1.79	5.72	5.35	3.03	5.58	6.29	2.85	9.18	1.68
50th-Percentile Queue Length [ft/ln]	76.85	73.50	45.67	44.76	143.11	133.82	75.67	139.61	157.26	71.21	229.48	42.10
95th-Percentile Queue Length [veh/ln]	5.53	5.29	3.29	3.22	9.65	9.15	5.45	9.46	10.40	5.13	14.15	3.03
95th-Percentile Queue Length [ft/ln]	138.34	132.29	82.20	80.56	241.21	228.67	136.21	236.50	260.09	128.19	353.69	75.78

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	51.73	16.77	16.17	53.36	21.09	21.35	52.42	36.32	37.79	52.04	41.74	32.72
Movement LOS	D	B	B	D	C	C	D	D	D	D	D	C
d_A, Approach Delay [s/veh]	24.84			24.92			40.36			43.14		
Approach LOS	C			C			D			D		
d_I, Intersection Delay [s/veh]	33.14											
Intersection LOS	C											
Intersection V/C	0.622											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	42.11	42.11	42.11	42.11
l_p,int, Pedestrian LOS Score for Intersection	3.092	2.980	2.905	2.947
Crosswalk LOS	C	C	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	666	590	742	742
d_b, Bicycle Delay [s]	23.36	26.10	20.77	20.77
l_b,int, Bicycle LOS Score for Intersection	2.093	2.171	2.366	2.395
Bicycle LOS	B	B	B	B

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 12: Carbon Canyon Road at Fairway Drive/Ginseng Lane

Control Type:	Two-way stop	Delay (sec / veh):	59.0
Analysis Method:	HCM 7th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.057

Intersection Setup

Name	Carbon Canyon Road			Carbon Canyon Road			Fairway Drive			Ginseng Lane		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	0	0	0	1	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	45.00			45.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			No			No		

Volumes

Name	Carbon Canyon Road			Carbon Canyon Road			Fairway Drive			Ginseng Lane		
Base Volume Input [veh/h]	14	347	0	1	1214	15	4	0	4	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	14	347	0	1	1214	15	4	0	4	0	0	0
Peak Hour Factor	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	4	92	0	0	323	4	1	0	1	0	0	0
Total Analysis Volume [veh/h]	15	369	0	1	1291	16	4	0	4	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Free	Free	Stop	Stop
Flared Lane				No
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance			No	No
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.03	0.00	0.00	0.00	0.01	0.00	0.06	0.00	0.02	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	12.00	0.00	0.00	8.03	0.00	0.00	59.03	48.34	23.63	57.21	45.76	10.32
Movement LOS	B	A	A	A	A	A	F	E	C	F	E	B
95th-Percentile Queue Length [veh/ln]	0.09	0.00	0.00	0.00	0.00	0.00	0.18	0.18	0.06	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	2.18	0.00	0.00	0.06	0.00	0.00	4.41	4.41	1.55	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	0.47			0.01			41.33			37.76		
Approach LOS	A			A			E			E		
d_I, Intersection Delay [s/veh]	0.31											
Intersection LOS	F											

Intersection Level Of Service Report
Intersection 13: Carbon Canyon Road at Canyon Hills Road

Control Type:	Two-way stop	Delay (sec / veh):	49.9
Analysis Method:	HCM 7th Edition	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.278

Intersection Setup

Name	Carbon Canyon Road		Carbon Canyon Road		Canyon Hills Road	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	1	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	45.00		45.00		25.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name	Carbon Canyon Road		Carbon Canyon Road		Canyon Hills Road	
Base Volume Input [veh/h]	11	254	1187	22	34	31
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	11	254	1187	22	34	31
Peak Hour Factor	0.9610	0.9610	0.9610	0.9610	0.9610	0.9610
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	66	309	6	9	8
Total Analysis Volume [veh/h]	11	264	1235	23	35	32
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.00	0.01	0.00	0.28	0.15
d_M, Delay for Movement [s/veh]	11.64	0.00	0.00	0.00	49.93	38.31
Movement LOS	B	A	A	A	E	E
95th-Percentile Queue Length [veh/ln]	0.06	0.00	0.00	0.00	1.92	1.92
95th-Percentile Queue Length [ft/ln]	1.52	0.00	0.00	0.00	48.10	48.10
d_A, Approach Delay [s/veh]	0.47		0.00		44.38	
Approach LOS	A		A		E	
d_I, Intersection Delay [s/veh]	1.94					
Intersection LOS	E					

Intersection Level Of Service Report
Intersection 1: Peyton Drive at Chino Avenue

Control Type:	Signalized	Delay (sec / veh):	31.0
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.556

Intersection Setup

Name	Peyton Drive			Peyton Drive			Chino Avenue			Chino Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	0	1	0	0	1	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Peyton Drive			Peyton Drive			Chino Avenue			Chino Avenue		
Base Volume Input [veh/h]	114	622	180	324	801	148	91	177	120	136	139	268
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	114	622	180	324	801	148	91	177	120	136	139	268
Peak Hour Factor	0.9570	0.9570	0.9570	0.9570	0.9570	0.9570	0.9570	0.9570	0.9570	0.9570	0.9570	0.9570
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	30	162	47	85	209	39	24	46	31	36	36	70
Total Analysis Volume [veh/h]	119	650	188	339	837	155	95	185	125	142	145	280
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	1	6	0	5	2	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	12	35	0	20	43	0	16	39	0	16	39	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	24	0	0	24	0	0	28	0	0	28	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	C	L	C	C	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	6	53	53	14	61	61	8	16	16	11	20	20
g / C, Green / Cycle	0.05	0.48	0.48	0.12	0.55	0.55	0.07	0.15	0.15	0.10	0.18	0.18
(v / s)_i Volume / Saturation Flow Rate	0.04	0.16	0.15	0.11	0.19	0.18	0.06	0.05	0.07	0.08	0.04	0.16
s, saturation flow rate [veh/h]	3200	3600	1800	3200	3600	1800	1700	3600	1800	1700	3600	1800
c, Capacity [veh/h]	175	1727	864	400	1981	991	120	539	270	170	645	323
d1, Uniform Delay [s]	51.11	17.69	17.52	47.13	13.67	13.57	50.38	41.94	42.76	48.66	38.64	43.91
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	4.62	0.51	0.94	5.01	0.46	0.88	11.09	0.38	1.24	10.23	0.17	7.06
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.68	0.33	0.31	0.85	0.34	0.33	0.79	0.34	0.46	0.84	0.22	0.87
d, Delay for Lane Group [s/veh]	55.73	18.20	18.46	52.14	14.13	14.45	61.47	42.32	44.00	58.90	38.81	50.97
Lane Group LOS	E	B	B	D	B	B	E	D	D	E	D	D
Critical Lane Group	No	Yes	No	Yes	No	No	Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	1.72	4.51	4.34	4.80	4.57	4.52	2.94	2.28	3.20	4.30	1.69	8.00
50th-Percentile Queue Length [ft/ln]	43.02	112.71	108.54	120.10	114.26	112.96	73.48	57.05	79.94	107.52	42.34	199.95
95th-Percentile Queue Length [veh/ln]	3.10	7.99	7.76	8.40	8.08	8.00	5.29	4.11	5.76	7.70	3.05	12.64
95th-Percentile Queue Length [ft/ln]	77.43	199.77	193.97	209.96	201.91	200.11	132.27	102.69	143.90	192.55	76.21	315.90

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	55.73	18.24	18.46	52.14	14.20	14.45	61.47	42.32	44.00	58.90	38.81	50.97
Movement LOS	E	B	B	D	B	B	E	D	D	E	D	D
d_A, Approach Delay [s/veh]	22.94			23.89			47.33			49.84		
Approach LOS	C			C			D			D		
d_I, Intersection Delay [s/veh]	31.04											
Intersection LOS	C											
Intersection V/C	0.556											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	44.58	44.58	44.58	44.58
l_p,int, Pedestrian LOS Score for Intersection	2.986	3.022	2.718	2.782
Crosswalk LOS	C	C	B	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	563	709	636	636
d_b, Bicycle Delay [s]	28.39	22.94	25.59	25.59
l_b,int, Bicycle LOS Score for Intersection	2.086	2.292	1.782	2.027
Bicycle LOS	B	B	A	B

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 2: Gateway Village/Boys Republic Drive at Grand Avenue

Control Type:	Signalized	Delay (sec / veh):	102.3
Analysis Method:	HCM 7th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.156

Intersection Setup

Name	Boys Republic Drive			Gateway Village			Grand Avenue			Grand Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	1	1	0	0	1	0	0	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			No		

Volumes

Name	Boys Republic Drive			Gateway Village			Grand Avenue			Grand Avenue		
Base Volume Input [veh/h]	12	30	542	246	48	65	103	1036	22	597	1051	119
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	12	30	542	246	48	65	103	1036	22	597	1051	119
Peak Hour Factor	0.9590	0.9590	0.9590	0.9590	0.9590	0.9590	0.9590	0.9590	0.9590	0.9590	0.9590	0.9590
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	8	141	64	13	17	27	270	6	156	274	31
Total Analysis Volume [veh/h]	13	31	565	257	50	68	107	1080	23	623	1096	124
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Split	Split	Split	Split	Split	Split	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	0	8	0	0	4	0	5	2	0	1	6	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	0	6	0	0	6	0	6	6	0	6	6	0
Maximum Green [s]	0	30	0	0	30	0	30	30	0	30	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	20	0	0	35	0	13	25	0	40	52	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	0	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	24	0	0	14	0	0	11	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall		No			No		No	No		No	No	
Maximum Recall		No			No		No	No		No	No	
Pedestrian Recall		No			No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	R	L	C	L	C	C	L	C	C
C, Cycle Length [s]	120	120	120	120	120	120	120	120	120	120
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	31	31	16	16	9	21	21	36	48	48
g / C, Green / Cycle	0.26	0.26	0.13	0.13	0.08	0.18	0.18	0.30	0.40	0.40
(v / s)_i Volume / Saturation Flow Rate	0.03	0.31	0.11	0.11	0.06	0.20	0.21	0.37	0.23	0.23
s, saturation flow rate [veh/h]	1700	1800	1700	1700	1700	3600	1800	1700	3600	1800
c, Capacity [veh/h]	438	463	226	226	128	636	318	510	1445	722
d1, Uniform Delay [s]	33.97	44.56	50.82	50.64	54.77	49.41	49.41	42.01	27.78	27.78
k, delay calibration	0.11	0.50	0.11	0.11	0.11	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.10	116.93	8.29	7.15	13.27	81.51	111.18	116.55	1.59	3.16
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.10	1.22	0.84	0.82	0.84	1.14	1.19	1.22	0.56	0.56
d, Delay for Lane Group [s/veh]	34.07	161.50	59.11	57.79	68.04	130.92	160.59	158.56	29.37	30.94
Lane Group LOS	C	F	E	E	E	F	F	F	C	C
Critical Lane Group	No	Yes	Yes	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	1.00	28.68	6.10	5.84	3.66	16.69	19.31	31.40	9.30	9.62
50th-Percentile Queue Length [ft/ln]	24.97	717.06	152.39	146.07	91.56	417.28	482.79	784.98	232.44	240.41
95th-Percentile Queue Length [veh/ln]	1.80	41.87	10.14	9.81	6.59	24.96	28.81	45.70	14.30	14.70
95th-Percentile Queue Length [ft/ln]	44.95	1046.68	253.61	245.18	164.81	623.94	720.23	1142.51	357.46	367.55

Movement, Approach, & Intersection Results

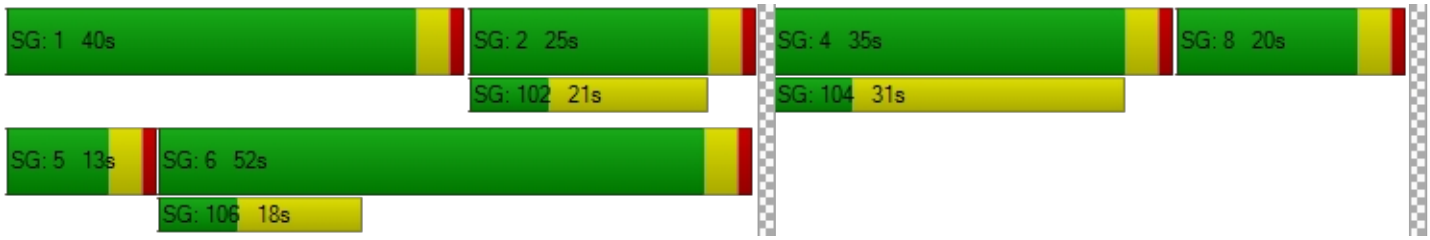
d_M, Delay for Movement [s/veh]	34.07	34.07	161.50	58.76	57.79	57.79	68.04	140.65	160.59	158.56	29.78	30.94
Movement LOS	C	C	F	E	E	E	E	F	F	F	C	C
d_A, Approach Delay [s/veh]	152.29			58.46			134.61			73.39		
Approach LOS	F			E			F			E		
d_I, Intersection Delay [s/veh]	102.25											
Intersection LOS	F											
Intersection V/C	1.156											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	0.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	49.51	49.51	49.51	0.00
l_p,int, Pedestrian LOS Score for Intersection	2.463	2.161	2.940	0.000
Crosswalk LOS	B	B	C	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	267	517	350	800
d_b, Bicycle Delay [s]	45.07	33.01	40.84	21.60
l_b,int, Bicycle LOS Score for Intersection	2.564	2.178	2.225	2.573
Bicycle LOS	B	B	B	B

Sequence

Ring 1	1	2	4	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 3: Peyton Drive at Eucalyptus Avenue

Control Type:	Signalized	Delay (sec / veh):	20.5
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.461

Intersection Setup

Name	Peyton Drive			Peyton Drive			Eucalyptus Avenue			Eucalyptus Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	1	1	0	0	1	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Peyton Drive			Peyton Drive			Eucalyptus Avenue			Eucalyptus Avenue		
Base Volume Input [veh/h]	20	413	168	204	556	290	190	250	17	160	239	196
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	20	413	168	204	556	290	190	250	17	160	239	196
Peak Hour Factor	0.9490	0.9490	0.9490	0.9490	0.9490	0.9490	0.9490	0.9490	0.9490	0.9490	0.9490	0.9490
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	5	109	44	54	146	76	50	66	4	42	63	52
Total Analysis Volume [veh/h]	21	435	177	215	586	306	200	263	18	169	252	207
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal Group	1	6	0	5	2	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	6	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	10	29	0	10	29	0	16	41	0	10	35	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	18	0	0	14	0	0	21	0	0	24	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		Yes	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	R	L	C	C	L	C	R
C, Cycle Length [s]	90	90	90	90	90	90	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	0.00	0.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	55	45	45	55	49	49	27	27	17	27	17	17
g / C, Green / Cycle	0.61	0.50	0.50	0.61	0.54	0.54	0.30	0.30	0.19	0.30	0.19	0.19
(v / s)_i Volume / Saturation Flow Rate	0.01	0.12	0.11	0.13	0.16	0.17	0.06	0.06	0.16	0.10	0.14	0.12
s, saturation flow rate [veh/h]	1700	3600	1800	1700	3600	1800	1700	1700	1800	1700	1800	1800
c, Capacity [veh/h]	991	1802	901	1037	1942	971	412	516	336	267	336	336
d1, Uniform Delay [s]	6.86	12.72	12.63	7.75	11.42	11.52	23.55	23.55	35.32	24.61	34.67	33.69
k, delay calibration	0.11	0.50	0.50	0.50	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.01	0.30	0.56	0.45	0.40	0.85	0.30	0.18	5.46	2.48	3.36	1.83
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.02	0.23	0.22	0.21	0.30	0.32	0.24	0.19	0.84	0.63	0.75	0.62
d, Delay for Lane Group [s/veh]	6.87	13.01	13.19	8.21	11.82	12.37	23.86	23.73	40.78	27.09	38.02	35.52
Lane Group LOS	A	B	B	A	B	B	C	C	D	C	D	D
Critical Lane Group	No	Yes	No	Yes	No	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	0.15	2.32	2.26	1.80	3.12	3.40	1.60	1.59	6.33	2.94	5.44	4.26
50th-Percentile Queue Length [ft/ln]	3.67	58.08	56.43	45.06	77.96	85.03	39.88	39.66	158.25	73.49	135.98	106.56
95th-Percentile Queue Length [veh/ln]	0.26	4.18	4.06	3.24	5.61	6.12	2.87	2.86	10.46	5.29	9.26	7.65
95th-Percentile Queue Length [ft/ln]	6.60	104.55	101.58	81.10	140.34	153.05	71.78	71.39	261.40	132.28	231.60	191.21

Movement, Approach, & Intersection Results

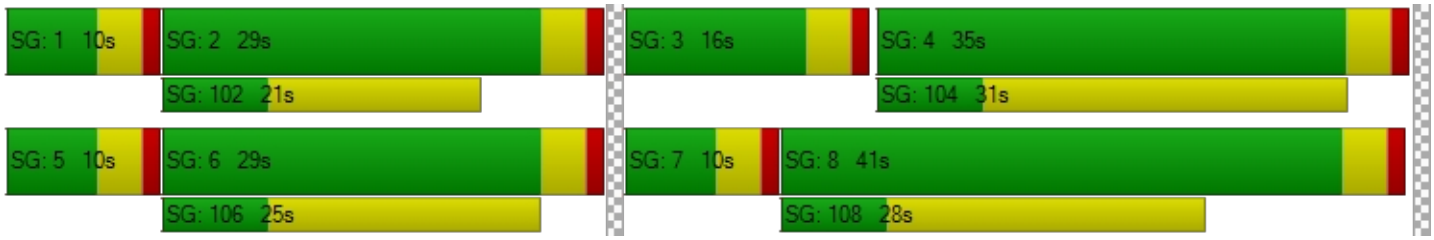
d_M, Delay for Movement [s/veh]	6.87	13.02	13.19	8.21	11.82	12.37	23.83	40.78	40.78	27.09	38.02	35.52
Movement LOS	A	B	B	A	B	B	C	D	D	C	D	D
d_A, Approach Delay [s/veh]	12.86			11.27			33.72			34.26		
Approach LOS	B			B			C			C		
d_I, Intersection Delay [s/veh]	20.48											
Intersection LOS	C											
Intersection V/C	0.461											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	34.72	34.72	34.72	34.72
l_p,int, Pedestrian LOS Score for Intersection	2.921	3.037	2.406	2.710
Crosswalk LOS	C	C	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	555	555	821	688
d_b, Bicycle Delay [s]	23.51	23.51	15.64	19.38
l_b,int, Bicycle LOS Score for Intersection	1.908	2.473	1.956	2.596
Bicycle LOS	A	B	A	B

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 4: Rustic Drive/Carbon Canyon Road at Chino Hills Parkway

Control Type:	Signalized	Delay (sec / veh):	29.8
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.733

Intersection Setup

Name	Carbon Canyon Road			Rustic Drive			Chino Hills Parkway			Chino Hills Parkway		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	1	0	0	1	0	1	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			No		

Volumes

Name	Carbon Canyon Road			Rustic Drive			Chino Hills Parkway			Chino Hills Parkway		
Base Volume Input [veh/h]	234	0	1168	12	0	0	9	647	164	380	628	11
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	234	0	1168	12	0	0	9	647	164	380	628	11
Peak Hour Factor	0.9730	0.9730	0.9730	0.9730	0.9730	0.9730	0.9730	0.9730	0.9730	0.9730	0.9730	0.9730
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	60	0	300	3	0	0	2	166	42	98	161	3
Total Analysis Volume [veh/h]	240	0	1200	12	0	0	9	665	169	391	645	11
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	95
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	0	8	0	0	4	0	5	2	0	1	6	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	0	6	0	0	6	0	6	6	0	6	6	0
Maximum Green [s]	0	30	0	0	30	0	30	30	0	30	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	49	0	0	49	0	10	29	0	17	36	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	0	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	21	0	0	18	0	0	11	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall		No			No		No	No		No	No	
Maximum Recall		No			No		No	No		No	No	
Pedestrian Recall		No			No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	L	C	R	L	C	C
C, Cycle Length [s]	95	95	95	95	95	95	95	95	95	95	95
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	36	36	36	36	36	1	34	34	13	46	46
g / C, Green / Cycle	0.37	0.37	0.37	0.37	0.37	0.01	0.36	0.36	0.14	0.48	0.48
(v / s)_i Volume / Saturation Flow Rate	0.14	0.33	0.33	0.01	0.00	0.01	0.18	0.09	0.12	0.18	0.18
s, saturation flow rate [veh/h]	1700	1800	1800	1700	1800	1700	3600	1800	3200	1800	1800
c, Capacity [veh/h]	677	675	675	145	675	25	1300	650	440	871	871
d1, Uniform Delay [s]	21.61	27.84	27.84	18.69	0.00	46.39	23.78	21.40	40.27	15.47	15.45
k, delay calibration	0.11	0.24	0.24	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.31	8.85	8.85	0.24	0.00	8.72	1.44	0.97	6.28	1.25	1.24
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.35	0.89	0.89	0.08	0.00	0.36	0.51	0.26	0.89	0.38	0.38
d, Delay for Lane Group [s/veh]	21.92	36.69	36.69	18.93	0.00	55.11	25.22	22.37	46.54	16.72	16.69
Lane Group LOS	C	D	D	B	A	E	C	C	D	B	B
Critical Lane Group	No	Yes	No	No	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	3.86	13.91	13.91	0.17	0.00	0.27	5.96	2.78	4.81	4.61	4.58
50th-Percentile Queue Length [ft/ln]	96.58	347.76	347.76	4.36	0.00	6.73	148.89	69.50	120.32	115.36	114.52
95th-Percentile Queue Length [veh/ln]	6.95	20.03	20.03	0.31	0.00	0.48	9.96	5.00	8.41	8.14	8.09
95th-Percentile Queue Length [ft/ln]	173.84	500.67	500.67	7.84	0.00	12.12	248.95	125.09	210.27	203.44	202.27

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	21.92	36.69	36.69	18.93	0.00	0.00	55.11	25.22	22.37	46.54	16.70	16.69
Movement LOS	C	D	D	B	A	A	E	C	C	D	B	B
d_A, Approach Delay [s/veh]	34.23			18.93			24.97			27.85		
Approach LOS	C			B			C			C		
d_I, Intersection Delay [s/veh]	29.84											
Intersection LOS	C											
Intersection V/C	0.733											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	0.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	37.14	37.14	37.14	0.00
l_p,int, Pedestrian LOS Score for Intersection	2.692	1.953	3.077	0.000
Crosswalk LOS	B	A	C	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	947	947	526	674
d_b, Bicycle Delay [s]	13.16	13.16	25.80	20.90
l_b,int, Bicycle LOS Score for Intersection	3.936	1.579	2.255	2.423
Bicycle LOS	D	A	B	B

Sequence

Ring 1	1	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 5: Peyton Drive at Chino Hills Parkway

Control Type:	Signalized	Delay (sec / veh):	47.0
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.942

Intersection Setup

Name	Peyton Drive			Peyton Drive			Chino Hills Parkway			Chino Hills Parkway		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	1	1	0	0	1	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Peyton Drive			Peyton Drive			Chino Hills Parkway			Chino Hills Parkway		
Base Volume Input [veh/h]	138	253	181	309	379	134	301	1078	363	233	722	270
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	138	253	181	309	379	134	301	1078	363	233	722	270
Peak Hour Factor	0.9720	0.9720	0.9720	0.9720	0.9720	0.9720	0.9720	0.9720	0.9720	0.9720	0.9720	0.9720
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	35	65	47	79	97	34	77	277	93	60	186	69
Total Analysis Volume [veh/h]	142	260	186	318	390	138	310	1109	373	240	743	278
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	115
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Overlap	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	3	8	0	7	4	4	5	2	0	1	6	0
Auxiliary Signal Groups						4,5						
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	6	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	30	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	1.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	13	35	0	26	48	48	17	41	0	13	37	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	7	0	7	0	0	7	0
Pedestrian Clearance [s]	0	24	0	0	21	21	0	21	0	0	21	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No	No	No	No		No	No	
Maximum Recall	No	No		No	No	No	No	No		No	No	
Pedestrian Recall	No	No		No	No	No	No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	R	L	C	C	L	C	R
C, Cycle Length [s]	115	115	115	115	115	115	115	115	115	115	115	115
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	7	18	18	22	33	50	13	50	50	9	46	46
g / C, Green / Cycle	0.06	0.15	0.15	0.19	0.28	0.43	0.11	0.44	0.44	0.08	0.40	0.40
(v / s)_i Volume / Saturation Flow Rate	0.04	0.13	0.12	0.19	0.11	0.08	0.10	0.42	0.41	0.08	0.21	0.15
s, saturation flow rate [veh/h]	3200	1800	1800	1700	3600	1800	3200	1800	1800	3200	3600	1800
c, Capacity [veh/h]	199	279	279	326	1023	779	364	783	783	255	1443	722
d1, Uniform Delay [s]	52.98	47.37	46.54	46.29	33.10	20.08	50.08	31.52	30.95	52.74	26.04	24.44
k, delay calibration	0.11	0.11	0.11	0.24	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	4.65	7.15	4.05	29.51	0.23	0.11	5.66	23.48	19.58	15.62	1.31	1.55
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.71	0.85	0.75	0.98	0.38	0.18	0.85	0.96	0.93	0.94	0.51	0.39
d, Delay for Lane Group [s/veh]	57.63	54.52	50.60	75.81	33.34	20.19	55.74	54.99	50.53	68.35	27.35	25.99
Lane Group LOS	E	D	D	E	C	C	E	D	D	E	C	C
Critical Lane Group	No	Yes	No	Yes	No	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	2.14	7.14	6.03	11.65	4.41	2.31	4.66	24.60	22.91	4.00	7.86	5.65
50th-Percentile Queue Length [ft/ln]	53.58	178.48	150.71	291.32	110.16	57.63	116.41	614.93	572.74	99.95	196.58	141.22
95th-Percentile Queue Length [veh/ln]	3.86	11.52	10.06	17.25	7.85	4.15	8.20	32.73	30.76	7.20	12.46	9.55
95th-Percentile Queue Length [ft/ln]	96.45	288.03	251.38	431.27	196.23	103.73	204.88	818.27	768.98	179.91	311.55	238.67

Movement, Approach, & Intersection Results

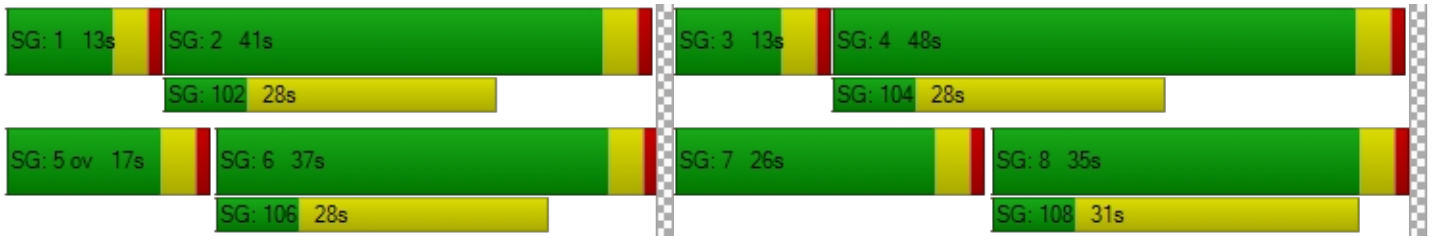
d_M, Delay for Movement [s/veh]	57.63	54.17	50.60	75.81	33.34	20.19	55.74	53.55	50.53	68.35	27.35	25.99
Movement LOS	E	D	D	E	C	C	E	D	D	E	C	C
d_A, Approach Delay [s/veh]	53.87			47.16			53.30			34.86		
Approach LOS	D			D			D			C		
d_I, Intersection Delay [s/veh]	47.03											
Intersection LOS	D											
Intersection V/C	0.942											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	47.07	47.07	47.07	47.07
l_p,int, Pedestrian LOS Score for Intersection	2.723	2.740	2.922	3.006
Crosswalk LOS	B	B	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	539	765	643	574
d_b, Bicycle Delay [s]	30.72	21.95	26.49	29.27
l_b,int, Bicycle LOS Score for Intersection	2.045	2.258	3.038	2.600
Bicycle LOS	B	B	C	B

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 6: Peyton Drive at Woodview Road

Control Type:	All-way stop	Delay (sec / veh):	9.2
Analysis Method:	HCM 7th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.287

Intersection Setup

Name	Peyton Drive		Woodview Road		Woodview Road	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	1	1	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	45.00		40.00		35.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

Volumes

Name	Peyton Drive		Woodview Road		Woodview Road	
Base Volume Input [veh/h]	170	59	36	23	33	100
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	170	59	36	23	33	100
Peak Hour Factor	0.9140	0.9140	0.9140	0.9140	0.9140	0.9140
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	46	16	10	6	9	27
Total Analysis Volume [veh/h]	186	65	39	25	36	109
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	649	827	615	673	776
Degree of Utilization, x	0.29	0.08	0.06	0.04	0.19

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	1.18	0.26	0.20	0.12	0.68
95th-Percentile Queue Length [ft]	29.58	6.38	5.06	2.89	17.08
Approach Delay [s/veh]	9.68		8.68		8.70
Approach LOS	A		A		A
Intersection Delay [s/veh]	9.23				
Intersection LOS	A				

Intersection Level Of Service Report
Intersection 7: Pipeline Avenue at Woodview Road

Control Type:	Two-way stop	Delay (sec / veh):	17.7
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.055

Intersection Setup

Name	Pipeline Avenue		Pipeline Avenue		Woodview Road	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	40.00		30.00		35.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name	Pipeline Avenue		Pipeline Avenue		Woodview Road	
Base Volume Input [veh/h]	114	200	268	18	18	182
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	114	200	268	18	18	182
Peak Hour Factor	0.9620	0.9620	0.9620	0.9620	0.9620	0.9620
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	30	52	70	5	5	47
Total Analysis Volume [veh/h]	119	208	279	19	19	189
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.09	0.00	0.00	0.00	0.05	0.25
d_M, Delay for Movement [s/veh]	7.99	0.00	0.00	0.00	17.74	12.13
Movement LOS	A	A	A	A	C	B
95th-Percentile Queue Length [veh/ln]	0.21	0.21	0.00	0.00	1.30	1.30
95th-Percentile Queue Length [ft/ln]	5.30	5.30	0.00	0.00	32.47	32.47
d_A, Approach Delay [s/veh]	2.91		0.00		12.64	
Approach LOS	A		A		B	
d_I, Intersection Delay [s/veh]	4.30					
Intersection LOS	C					

Intersection Level Of Service Report
Intersection 8: Pipeline Avenue at Soquel Canyon Parkway

Control Type:	All-way stop	Delay (sec / veh):	17.8
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.723

Intersection Setup

Name	Pipeline Avenue		Soquel Canyon Parkway		Soquel Canyon Parkway	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	1	0	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	40.00		45.00		50.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		No	

Volumes

Name	Pipeline Avenue		Soquel Canyon Parkway		Soquel Canyon Parkway	
Base Volume Input [veh/h]	404	22	14	27	29	310
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	404	22	14	27	29	310
Peak Hour Factor	0.9350	0.9350	0.9350	0.9350	0.9350	0.9350
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	108	6	4	7	8	83
Total Analysis Volume [veh/h]	432	24	15	29	31	332
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	630	504	544	544	544	576	576	653
Degree of Utilization, x	0.72	0.03	0.02	0.02	0.02	0.03	0.03	0.51

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	6.12	0.09	0.05	0.05	0.05	0.08	0.08	2.89
95th-Percentile Queue Length [ft]	153.09	2.30	1.36	1.36	1.36	2.07	2.07	72.37
Approach Delay [s/veh]	22.18	9.65				13.38		
Approach LOS	C	A				B		
Intersection Delay [s/veh]	17.84							
Intersection LOS	C							

Intersection Level Of Service Report

Intersection 9: Soquel Canyon Parkway at Los Serranos Country Club Drive/Butterfield Ranch Road

Control Type:	Signalized	Delay (sec / veh):	35.0
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.470

Intersection Setup

Name	Soquel Canyon Parkway			Soquel Canyon Parkway			Lo Se			Butterfield Ranch Road		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	0	1	0	0	1	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Soquel Canyon Parkway			Soquel Canyon Parkway			Lo Se			Butterfield Ranch Road		
Base Volume Input [veh/h]	33	346	114	306	562	219	361	216	37	162	132	267
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	33	346	114	306	562	219	361	216	37	162	132	267
Peak Hour Factor	0.9020	0.9020	0.9020	0.9020	0.9020	0.9020	0.9020	0.9020	0.9020	0.9020	0.9020	0.9020
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	9	96	32	85	156	61	100	60	10	45	37	74
Total Analysis Volume [veh/h]	37	384	126	339	623	243	400	239	41	180	146	296
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Overlap
Signal Group	1	6	0	5	2	0	3	8	0	7	4	4
Auxiliary Signal Groups												4,5
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	6
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	30
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	3.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	1.0
Split [s]	10	39	0	19	48	0	23	39	0	23	39	39
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	3.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	7
Pedestrian Clearance [s]	0	28	0	0	18	0	0	28	0	0	28	28
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	2.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	2.0
Minimum Recall	No	No		No	No		No	No		No	No	No
Maximum Recall	No	No		No	No		No	No		No	No	No
Pedestrian Recall	No	No		No	No		No	No		No	No	No
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	C	L	C	C	L	C	R
C, Cycle Length [s]	120	120	120	120	120	120	120	120	120	120	120	120
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	0.00
g_i, Effective Green Time [s]	4	60	60	15	70	70	17	21	21	9	13	31
g / C, Green / Cycle	0.04	0.50	0.50	0.12	0.58	0.58	0.14	0.17	0.17	0.07	0.10	0.26
(v / s)_i Volume / Saturation Flow Rate	0.02	0.10	0.09	0.11	0.17	0.15	0.13	0.08	0.08	0.06	0.08	0.08
s, saturation flow rate [veh/h]	1700	3600	1800	3200	3600	1800	3200	1800	1800	3200	1800	3600
c, Capacity [veh/h]	62	1789	895	391	2099	1049	455	310	310	240	189	939
d1, Uniform Delay [s]	56.99	16.78	16.73	51.73	12.50	12.29	50.47	44.67	44.49	54.43	52.32	35.75
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	8.97	0.24	0.46	5.87	0.34	0.60	5.61	1.07	0.98	4.68	6.53	0.19
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.60	0.19	0.19	0.87	0.28	0.26	0.88	0.46	0.44	0.75	0.77	0.32
d, Delay for Lane Group [s/veh]	65.96	17.02	17.19	57.59	12.84	12.88	56.08	45.74	45.48	59.12	58.85	35.94
Lane Group LOS	E	B	B	E	B	B	E	D	D	E	E	D
Critical Lane Group	No	Yes	No	Yes	No	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	1.26	2.69	2.66	5.32	4.02	3.68	6.23	3.94	3.74	2.82	4.63	3.54
50th-Percentile Queue Length [ft/ln]	31.52	67.24	66.55	133.04	100.41	91.98	155.84	98.49	93.52	70.58	115.68	88.43
95th-Percentile Queue Length [veh/ln]	2.27	4.84	4.79	9.10	7.23	6.62	10.33	7.09	6.73	5.08	8.15	6.37
95th-Percentile Queue Length [ft/ln]	56.73	121.03	119.79	227.62	180.73	165.57	258.21	177.28	168.34	127.05	203.87	159.17

Movement, Approach, & Intersection Results

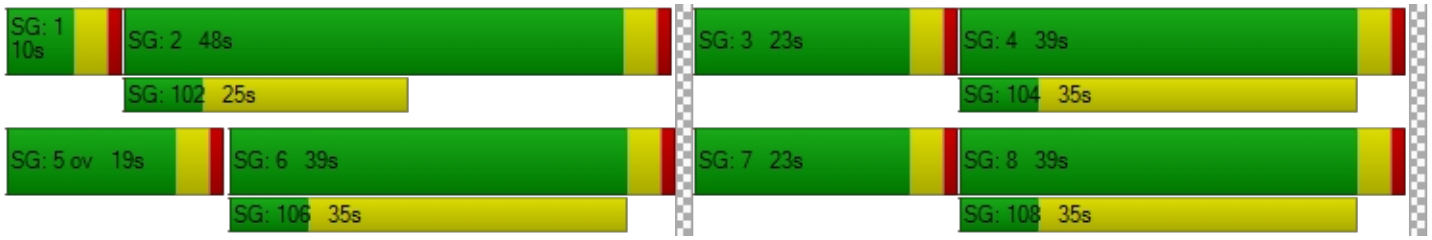
d_M, Delay for Movement [s/veh]	65.96	17.04	17.19	57.59	12.84	12.88	56.08	45.63	45.48	59.12	58.85	35.94
Movement LOS	E	B	B	E	B	B	E	D	D	E	E	D
d_A, Approach Delay [s/veh]	20.39			25.44			51.77			48.03		
Approach LOS	C			C			D			D		
d_I, Intersection Delay [s/veh]	35.00											
Intersection LOS	C											
Intersection V/C	0.470											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	49.52	49.52	49.52	49.52
l_p,int, Pedestrian LOS Score for Intersection	2.801	3.018	2.529	2.901
Crosswalk LOS	C	C	B	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	583	733	583	583
d_b, Bicycle Delay [s]	30.12	24.08	30.12	30.12
l_b,int, Bicycle LOS Score for Intersection	1.860	2.222	2.121	2.586
Bicycle LOS	A	B	B	B

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

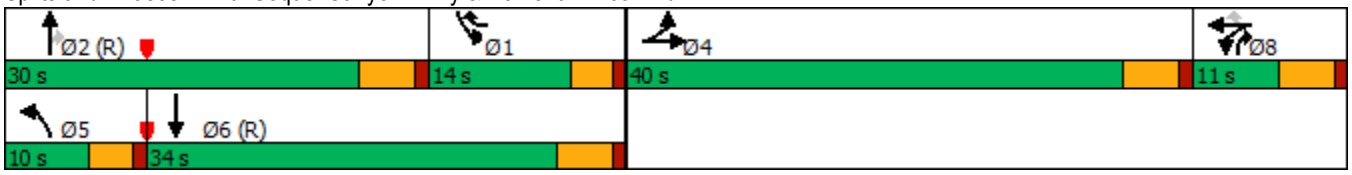


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	62	27	10	121	4	259	29	721	230	559	919	62
Future Volume (vph)	62	27	10	121	4	259	29	721	230	559	919	62
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	0.95	0.91	0.95	1.00	0.86	0.86	0.97	0.91	0.91
Frt		0.960			0.867	0.850		0.995	0.850		0.991	
Flt Protected	0.950			0.950	0.996		0.950			0.950		
Satd. Flow (prot)	1770	1788	0	1681	1464	1504	1770	4782	1362	3433	5040	0
Flt Permitted	0.950			0.950	0.996		0.950			0.950		
Satd. Flow (perm)	1770	1788	0	1681	1464	1504	1770	4782	1362	3433	5040	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		11			135	153		5	230		11	
Link Speed (mph)		25			25			50			50	
Link Distance (ft)		560			625			594			526	
Travel Time (s)		15.3			17.0			8.1			7.2	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	69	30	11	134	4	288	32	801	256	621	1021	69
Shared Lane Traffic (%)				10%		47%			10%			
Lane Group Flow (vph)	69	41	0	121	152	153	32	827	230	621	1090	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2	1	1	2	1	1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100		20	100	20	20	100	20	20	100	
Trailing Detector (ft)	0	0		0	0	0	0	0	0	0	0	
Detector 1 Position(ft)	0	0		0	0	0	0	0	0	0	0	
Detector 1 Size(ft)	20	6		20	6	20	20	6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Split	NA		Split	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	
Protected Phases	4	4		8	8	1	5	2	8	1	6	
Permitted Phases						8			2			
Detector Phase	4	4		8	8	1	5	2	8	1	6	
Switch Phase												
Minimum Initial (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Split (s)	40.0	40.0		11.0	11.0	10.0	10.0	30.0	11.0	10.0	23.0	
Total Split (s)	40.0	40.0		11.0	11.0	14.0	10.0	30.0	11.0	14.0	34.0	
Total Split (%)	42.1%	42.1%		11.6%	11.6%	14.7%	10.5%	31.6%	11.6%	14.7%	35.8%	
Maximum Green (s)	35.0	35.0		6.0	6.0	10.0	6.0	25.0	6.0	10.0	29.0	
Yellow Time (s)	4.0	4.0		4.0	4.0	3.0	3.0	4.0	4.0	3.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0	4.0	4.0	5.0	5.0	4.0	5.0	
Lead/Lag						Lag	Lead	Lead		Lag	Lag	
Lead-Lag Optimize?						Yes	Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	None		None	None	None	None	C-Max	None	None	C-Max	
Walk Time (s)	7.0	7.0						7.0			7.0	
Flash Dont Walk (s)	28.0	28.0						18.0			11.0	
Pedestrian Calls (#/hr)	5	5						5			5	
Act Effct Green (s)	13.6	13.6		13.9	13.9	25.7	6.7	40.7	59.6	10.0	48.1	
Actuated g/C Ratio	0.14	0.14		0.15	0.15	0.27	0.07	0.43	0.63	0.11	0.51	
v/c Ratio	0.27	0.15		0.49	0.46	0.30	0.26	0.40	0.24	1.72	0.43	
Control Delay	35.2	25.1		48.0	15.2	4.4	47.3	21.5	3.0	364.6	18.4	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	35.2	25.1		48.0	15.2	4.4	47.3	21.5	3.0	364.6	18.4	
LOS	D	C		D	B	A	D	C	A	F	B	
Approach Delay		31.4			20.6			18.4			144.0	
Approach LOS		C			C			B			F	

Intersection Summary			
Area Type:	Other		
Cycle Length: 95			
Actuated Cycle Length: 95			
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green			
Natural Cycle: 105			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.72			
Intersection Signal Delay: 83.5		Intersection LOS: F	
Intersection Capacity Utilization 56.0%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 10: Soquel Canyon Pkwy & Pomona Rincon Rd



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	62	27	10	121	4	259	29	721	230	559	919	62
Future Volume (veh/h)	62	27	10	121	4	259	29	721	230	559	919	62
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	69	30	11	91	0	337	32	801	256	621	1021	69
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	106	78	29	113	0	1479	64	1477	517	1394	3132	211
Arrive On Green	0.06	0.06	0.06	0.06	0.00	0.06	0.04	0.26	0.26	0.40	0.64	0.64
Sat Flow, veh/h	1781	1306	479	1781	0	3170	1781	5611	1585	3456	4885	330
Grp Volume(v), veh/h	69	0	41	91	0	337	32	801	256	621	711	379
Grp Sat Flow(s),veh/h/ln	1781	0	1784	1781	0	1585	1781	1870	1585	1728	1702	1811
Q Serve(g_s), s	3.6	0.0	2.1	4.8	0.0	0.0	1.7	11.7	12.3	12.4	9.0	9.0
Cycle Q Clear(g_c), s	3.6	0.0	2.1	4.8	0.0	0.0	1.7	11.7	12.3	12.4	9.0	9.0
Prop In Lane	1.00		0.27	1.00		1.00	1.00		1.00	1.00		0.18
Lane Grp Cap(c), veh/h	106	0	107	113	0	1479	64	1477	517	1394	2182	1161
V/C Ratio(X)	0.65	0.00	0.38	0.81	0.00	0.23	0.50	0.54	0.49	0.45	0.33	0.33
Avail Cap(c_a), veh/h	656	0	657	113	0	1479	113	1477	517	1394	2182	1161
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	43.7	0.0	43.0	43.9	0.0	15.1	44.9	30.1	25.7	20.6	7.7	7.7
Incr Delay (d2), s/veh	6.5	0.0	2.3	34.0	0.0	0.1	5.9	1.4	3.4	0.2	0.4	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.8	0.0	1.0	3.2	0.0	2.2	0.8	5.1	5.3	4.6	2.7	3.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	50.2	0.0	45.3	77.9	0.0	15.2	50.8	31.5	29.1	20.8	8.1	8.5
LnGrp LOS	D	A	D	E	A	B	D	C	C	C	A	A
Approach Vol, veh/h		110			428			1089			1711	
Approach Delay, s/veh		48.3			28.5			31.5			12.8	
Approach LOS		D			C			C			B	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	43.3	30.0		10.7	7.4	65.9		11.0				
Change Period (Y+Rc), s	5.0	* 5		5.0	4.0	5.0		5.0				
Max Green Setting (Gmax), s	10.0	* 25		35.0	6.0	29.0		6.0				
Max Q Clear Time (g_c+I1), s	14.4	14.3		5.6	3.7	11.0		6.8				
Green Ext Time (p_c), s	0.0	4.3		0.4	0.0	6.2		0.0				

Intersection Summary			
HCM 6th Ctrl Delay		22.1	
HCM 6th LOS		C	

Notes

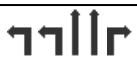
User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection Level Of Service Report
Intersection 11: Peyton Drive at Grand Avenue

Control Type:	Signalized	Delay (sec / veh):	35.5
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.557

Intersection Setup

Name	Peyton Drive			Peyton Drive			Grand Avenue			Grand Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	1	0	0	1	0	1	1	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Peyton Drive			Peyton Drive			Grand Avenue			Grand Avenue		
Base Volume Input [veh/h]	123	599	152	204	599	150	309	757	148	235	379	233
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	123	599	152	204	599	150	309	757	148	235	379	233
Peak Hour Factor	0.9730	0.9730	0.9730	0.9730	0.9730	0.9730	0.9730	0.9730	0.9730	0.9730	0.9730	0.9730
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	32	154	39	52	154	39	79	195	38	60	97	60
Total Analysis Volume [veh/h]	126	616	156	210	616	154	318	778	152	242	390	239
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	1	6	0	5	2	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	13	39	0	13	39	0	19	44	0	14	39	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	28	0	0	24	0	0	31	0	0	28	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	C	L	C	R	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	6	48	48	9	51	51	13	27	27	10	24	24
g / C, Green / Cycle	0.06	0.43	0.43	0.08	0.46	0.46	0.12	0.25	0.25	0.09	0.22	0.22
(v / s)_i Volume / Saturation Flow Rate	0.04	0.11	0.09	0.07	0.14	0.14	0.10	0.22	0.08	0.08	0.11	0.13
s, saturation flow rate [veh/h]	3200	5400	1800	3200	3600	1800	3200	3600	1800	3200	3600	1800
c, Capacity [veh/h]	183	2340	780	264	1651	826	379	890	445	293	794	397
d1, Uniform Delay [s]	50.95	19.95	19.35	49.60	18.86	18.72	47.52	39.79	34.06	49.15	37.51	38.56
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	4.58	0.27	0.58	5.42	0.50	0.94	5.05	2.88	0.45	5.87	0.47	1.47
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.69	0.26	0.20	0.80	0.32	0.30	0.84	0.87	0.34	0.83	0.49	0.60
d, Delay for Lane Group [s/veh]	55.52	20.23	19.93	55.01	19.36	19.66	52.57	42.66	34.52	55.02	37.98	40.03
Lane Group LOS	E	C	B	E	B	B	D	D	C	E	D	D
Critical Lane Group	Yes	No	No	No	Yes	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	1.82	3.40	2.59	3.03	4.27	4.16	4.52	10.35	3.40	3.50	4.63	5.94
50th-Percentile Queue Length [ft/ln]	45.45	85.01	64.67	75.69	106.65	104.02	112.91	258.65	84.95	87.45	115.83	148.38
95th-Percentile Queue Length [veh/ln]	3.27	6.12	4.66	5.45	7.65	7.49	8.00	15.62	6.12	6.30	8.16	9.93
95th-Percentile Queue Length [ft/ln]	81.82	153.02	116.41	136.24	191.33	187.24	200.04	390.52	152.91	157.40	204.08	248.27

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	55.52	20.23	19.93	55.01	19.41	19.66	52.57	42.66	34.52	55.02	37.98	40.03
Movement LOS	E	C	B	E	B	B	D	D	C	E	D	D
d_A, Approach Delay [s/veh]	25.13			27.08			44.20			43.28		
Approach LOS	C			C			D			D		
d_I, Intersection Delay [s/veh]	35.51											
Intersection LOS	D											
Intersection V/C	0.557											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	44.58	44.58	44.58	44.58
l_p,int, Pedestrian LOS Score for Intersection	3.065	2.997	2.871	2.981
Crosswalk LOS	C	C	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	636	636	727	636
d_b, Bicycle Delay [s]	25.59	25.59	22.29	25.59
l_b,int, Bicycle LOS Score for Intersection	2.054	2.099	2.589	2.278
Bicycle LOS	B	B	B	B

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 12: Carbon Canyon Road at Fairway Drive/Ginseng Lane

Control Type:	Two-way stop	Delay (sec / veh):	72.1
Analysis Method:	HCM 7th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.232

Intersection Setup

Name	Carbon Canyon Road			Carbon Canyon Road			Fairway Drive			Ginseng Lane		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	0	0	0	1	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	45.00			45.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			No			No		

Volumes

Name	Carbon Canyon Road			Carbon Canyon Road			Fairway Drive			Ginseng Lane		
Base Volume Input [veh/h]	7	1226	4	8	413	11	16	0	12	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	7	1226	4	8	413	11	16	0	12	0	0	0
Peak Hour Factor	0.9750	0.9750	0.9750	0.9750	0.9750	0.9750	0.9750	0.9750	0.9750	0.9750	0.9750	0.9750
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	314	1	2	106	3	4	0	3	0	0	0
Total Analysis Volume [veh/h]	7	1257	4	8	424	11	16	0	12	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Free	Free	Stop	Stop
Flared Lane				No
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance			No	No
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.01	0.00	0.01	0.00	0.00	0.23	0.00	0.02	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	8.22	0.00	0.00	11.63	0.00	0.00	72.14	61.19	10.87	58.63	46.35	22.29
Movement LOS	A	A	A	B	A	A	F	F	B	F	E	C
95th-Percentile Queue Length [veh/ln]	0.02	0.00	0.00	0.04	0.00	0.00	0.81	0.81	0.06	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	0.47	0.00	0.00	1.10	0.00	0.00	20.15	20.15	1.47	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	0.05			0.21			45.88			42.42		
Approach LOS	A			A			E			E		
d_I, Intersection Delay [s/veh]	0.83											
Intersection LOS	F											

Intersection Level Of Service Report
Intersection 13: Carbon Canyon Road at Canyon Hills Road

Control Type:	Two-way stop	Delay (sec / veh):	45.9
Analysis Method:	HCM 7th Edition	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.234

Intersection Setup

Name	Carbon Canyon Road		Carbon Canyon Road		Canyon Hills Road	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	1	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	45.00		45.00		25.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name	Carbon Canyon Road		Carbon Canyon Road		Canyon Hills Road	
Base Volume Input [veh/h]	11	1223	335	36	24	20
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	11	1223	335	36	24	20
Peak Hour Factor	0.9650	0.9650	0.9650	0.9650	0.9650	0.9650
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	317	87	9	6	5
Total Analysis Volume [veh/h]	11	1267	347	37	25	21
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.01	0.00	0.00	0.23	0.03
d_M, Delay for Movement [s/veh]	8.09	0.00	0.00	0.00	45.94	17.59
Movement LOS	A	A	A	A	E	C
95th-Percentile Queue Length [veh/ln]	0.03	0.00	0.00	0.00	1.01	1.01
95th-Percentile Queue Length [ft/ln]	0.71	0.00	0.00	0.00	25.37	25.37
d_A, Approach Delay [s/veh]	0.07		0.00		33.00	
Approach LOS	A		A		D	
d_I, Intersection Delay [s/veh]	0.94					
Intersection LOS	E					

APPENDIX C-II

EXISTING WITH PROJECT TRAFFIC CONDITIONS

Intersection Level Of Service Report
Intersection 1: Peyton Drive at Chino Avenue

Control Type:	Signalized	Delay (sec / veh):	38.2
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.518

Intersection Setup

Name	Peyton Drive			Peyton Drive			Chino Avenue			Chino Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	0	1	0	0	1	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Peyton Drive			Peyton Drive			Chino Avenue			Chino Avenue		
Base Volume Input [veh/h]	160	497	121	147	404	201	225	324	122	109	316	117
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	160	497	121	147	404	201	225	324	122	109	316	117
Peak Hour Factor	0.8510	0.8510	0.8510	0.8510	0.8510	0.8510	0.8510	0.8510	0.8510	0.8510	0.8510	0.8510
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	47	146	36	43	119	59	66	95	36	32	93	34
Total Analysis Volume [veh/h]	188	584	142	173	475	236	264	381	143	128	371	137
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	1	6	0	5	2	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	12	35	0	12	35	0	34	39	0	34	39	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	24	0	0	24	0	0	28	0	0	28	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	C	L	C	C	L	C	R
C, Cycle Length [s]	120	120	120	120	120	120	120	120	120	120	120	120
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	8	60	60	8	60	60	21	25	25	11	15	15
g / C, Green / Cycle	0.07	0.50	0.50	0.07	0.50	0.50	0.17	0.21	0.21	0.09	0.13	0.13
(v / s)_i Volume / Saturation Flow Rate	0.06	0.14	0.13	0.05	0.13	0.13	0.16	0.10	0.09	0.08	0.10	0.08
s, saturation flow rate [veh/h]	3200	3600	1800	3200	3600	1800	1700	3600	1800	1700	3600	1800
c, Capacity [veh/h]	216	1798	899	216	1798	899	294	749	374	156	457	229
d1, Uniform Delay [s]	55.48	17.40	17.30	55.20	17.32	17.30	48.63	41.79	41.52	53.55	51.00	49.52
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.17	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	10.44	0.37	0.71	6.82	0.36	0.71	14.31	0.47	0.84	10.10	3.51	2.51
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.87	0.27	0.26	0.80	0.26	0.26	0.90	0.48	0.45	0.82	0.81	0.60
d, Delay for Lane Group [s/veh]	65.91	17.78	18.01	62.02	17.68	18.01	62.94	42.27	42.35	63.64	54.51	52.02
Lane Group LOS	E	B	B	E	B	B	E	D	D	E	D	D
Critical Lane Group	Yes	No	No	No	Yes	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	3.13	4.00	3.92	2.79	3.86	3.92	8.89	4.70	4.43	4.23	5.65	4.05
50th-Percentile Queue Length [ft/ln]	78.27	100.06	97.93	69.63	96.49	98.00	222.21	117.62	110.73	105.78	141.18	101.21
95th-Percentile Queue Length [veh/ln]	5.64	7.20	7.05	5.01	6.95	7.06	13.78	8.26	7.88	7.60	9.54	7.29
95th-Percentile Queue Length [ft/ln]	140.89	180.11	176.28	125.33	173.68	176.40	344.44	206.56	197.01	190.12	238.61	182.18

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	65.91	17.82	18.01	62.02	17.68	18.01	62.94	42.27	42.35	63.64	54.51	52.02
Movement LOS	E	B	B	E	B	B	E	D	D	E	D	D
d_A, Approach Delay [s/veh]	27.74			26.45			49.21			55.81		
Approach LOS	C			C			D			E		
d_I, Intersection Delay [s/veh]	38.18											
Intersection LOS	D											
Intersection V/C	0.518											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	49.52	49.52	49.52	49.52
l_p,int, Pedestrian LOS Score for Intersection	2.942	2.967	2.828	2.793
Crosswalk LOS	C	C	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	517	517	583	583
d_b, Bicycle Delay [s]	33.02	33.02	30.12	30.12
l_b,int, Bicycle LOS Score for Intersection	2.062	2.046	1.993	2.084
Bicycle LOS	B	B	A	B

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 2: Gateway Village/Boys Republic Drive at Grand Avenue

Control Type:	Signalized	Delay (sec / veh):	57.5
Analysis Method:	HCM 7th Edition	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.961

Intersection Setup

Name	Boys Republic Drive			Gateway Village			Grand Avenue			Grand Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	1	1	0	0	1	0	0	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			No		

Volumes

Name	Boys Republic Drive			Gateway Village			Grand Avenue			Grand Avenue		
Base Volume Input [veh/h]	54	26	455	79	31	31	49	566	16	491	828	73
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	54	26	455	79	31	31	49	566	16	491	828	73
Peak Hour Factor	0.8330	0.8330	0.8330	0.8330	0.8330	0.8330	0.8330	0.8330	0.8330	0.8330	0.8330	0.8330
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	16	8	137	24	9	9	15	170	5	147	248	22
Total Analysis Volume [veh/h]	65	31	546	95	37	37	59	679	19	589	994	88
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Split	Split	Split	Split	Split	Split	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	0	8	0	0	4	0	5	2	0	1	6	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	0	6	0	0	6	0	6	6	0	6	6	0
Maximum Green [s]	0	30	0	0	30	0	30	30	0	30	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	16	0	0	35	0	47	25	0	44	22	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	0	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	24	0	0	14	0	0	11	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall		No			No		No	No		No	No	
Maximum Recall		No			No		No	No		No	No	
Pedestrian Recall		No			No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	R	L	C	L	C	C	L	C	C
C, Cycle Length [s]	120	120	120	120	120	120	120	120	120	120
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	35	35	8	8	5	21	21	40	56	56
g / C, Green / Cycle	0.29	0.29	0.07	0.07	0.04	0.18	0.18	0.33	0.46	0.46
(v / s)_i Volume / Saturation Flow Rate	0.06	0.30	0.05	0.05	0.03	0.13	0.13	0.35	0.20	0.20
s, saturation flow rate [veh/h]	1700	1800	1700	1700	1700	3600	1800	1700	3600	1800
c, Capacity [veh/h]	491	519	117	117	76	634	317	567	1673	837
d1, Uniform Delay [s]	32.19	42.69	54.81	54.75	56.73	46.67	46.94	40.00	21.48	21.52
k, delay calibration	0.11	0.49	0.11	0.11	0.11	0.50	0.50	0.49	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.19	53.30	8.50	8.00	15.41	7.04	15.17	48.15	0.81	1.63
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.20	1.05	0.73	0.72	0.78	0.72	0.75	1.04	0.43	0.43
d, Delay for Lane Group [s/veh]	32.38	95.99	63.31	62.75	72.13	53.71	62.11	88.15	22.28	23.15
Lane Group LOS	C	F	E	E	E	D	E	F	C	C
Critical Lane Group	No	Yes	Yes	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	2.14	22.88	2.80	2.74	2.10	7.10	8.10	24.01	6.92	7.18
50th-Percentile Queue Length [ft/ln]	53.59	572.10	70.11	68.47	52.38	177.38	202.61	600.36	172.97	179.49
95th-Percentile Queue Length [veh/ln]	3.86	31.73	5.05	4.93	3.77	11.46	12.77	32.91	11.23	11.57
95th-Percentile Queue Length [ft/ln]	96.46	793.20	126.20	123.25	94.29	286.59	319.33	822.72	280.82	289.35

Movement, Approach, & Intersection Results

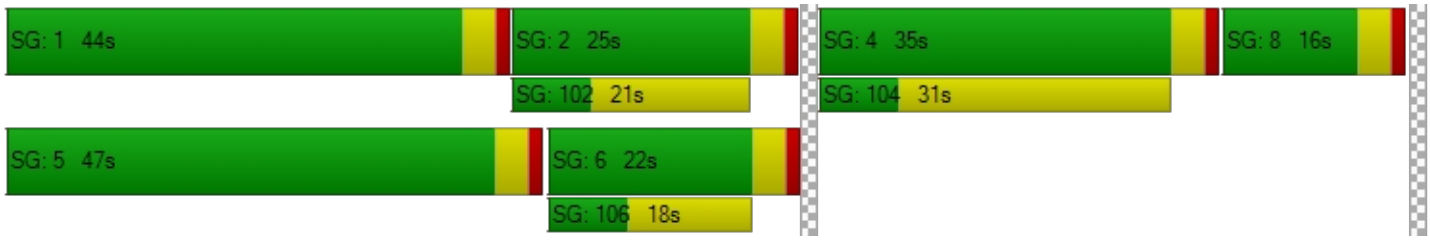
d_M, Delay for Movement [s/veh]	32.38	32.38	95.99	63.25	62.75	62.75	72.13	56.43	62.11	88.15	22.52	23.15
Movement LOS	C	C	F	E	E	E	E	E	E	F	C	C
d_A, Approach Delay [s/veh]	86.47			63.03			57.80			45.69		
Approach LOS	F			E			E			D		
d_I, Intersection Delay [s/veh]	57.51											
Intersection LOS	E											
Intersection V/C	0.961											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	0.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	49.50	49.50	49.50	0.00
l_p,int, Pedestrian LOS Score for Intersection	2.459	2.067	2.866	0.000
Crosswalk LOS	B	B	C	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	200	517	350	300
d_b, Bicycle Delay [s]	48.60	33.00	40.84	43.35
l_b,int, Bicycle LOS Score for Intersection	2.619	1.838	1.976	2.479
Bicycle LOS	B	A	A	B

Sequence

Ring 1	1	2	4	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 3: Peyton Drive at Eucalyptus Avenue

Control Type:	Signalized	Delay (sec / veh):	20.8
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.605

Intersection Setup

Name	Peyton Drive			Peyton Drive			Eucalyptus Avenue			Eucalyptus Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	1	1	0	0	1	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Peyton Drive			Peyton Drive			Eucalyptus Avenue			Eucalyptus Avenue		
Base Volume Input [veh/h]	12	575	105	175	506	225	252	115	18	124	107	255
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	12	575	105	175	506	225	252	115	18	124	107	255
Peak Hour Factor	0.6850	0.6850	0.6850	0.6850	0.6850	0.6850	0.6850	0.6850	0.6850	0.6850	0.6850	0.6850
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	4	210	38	64	185	82	92	42	7	45	39	93
Total Analysis Volume [veh/h]	18	839	153	255	739	328	368	168	26	181	156	372
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal Group	1	6	0	5	2	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	6	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	10	29	0	12	31	0	10	32	0	17	39	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	18	0	0	14	0	0	21	0	0	24	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		Yes	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	R	L	C	C	L	C	R
C, Cycle Length [s]	90	90	90	90	90	90	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	0.00	0.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	55	43	43	55	49	49	27	27	13	27	17	17
g / C, Green / Cycle	0.61	0.48	0.48	0.61	0.54	0.54	0.30	0.30	0.15	0.30	0.19	0.19
(v / s)_i Volume / Saturation Flow Rate	0.01	0.19	0.18	0.15	0.21	0.18	0.11	0.11	0.11	0.11	0.15	0.14
s, saturation flow rate [veh/h]	1700	3600	1800	1700	3600	1800	1700	1700	1800	1700	1800	1800
c, Capacity [veh/h]	943	1723	861	946	1954	977	388	449	266	346	338	338
d1, Uniform Delay [s]	6.84	15.04	14.97	7.96	11.87	11.53	24.87	24.87	36.71	24.82	35.07	34.64
k, delay calibration	0.11	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.01	0.66	1.26	0.70	0.56	0.93	4.12	2.75	3.83	1.23	4.63	3.40
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.02	0.39	0.38	0.27	0.38	0.34	0.47	0.41	0.73	0.52	0.81	0.75
d, Delay for Lane Group [s/veh]	6.85	15.70	16.23	8.66	12.43	12.46	28.99	27.62	40.54	26.04	39.70	38.04
Lane Group LOS	A	B	B	A	B	B	C	C	D	C	D	D
Critical Lane Group	No	Yes	No	Yes	No	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.13	4.30	4.33	2.22	4.12	3.67	3.47	3.37	4.29	3.09	6.07	5.49
50th-Percentile Queue Length [ft/ln]	3.14	107.61	108.34	55.58	102.95	91.84	86.83	84.32	107.37	77.30	151.67	137.33
95th-Percentile Queue Length [veh/ln]	0.23	7.71	7.75	4.00	7.41	6.61	6.25	6.07	7.69	5.57	10.11	9.34
95th-Percentile Queue Length [ft/ln]	5.66	192.68	193.69	100.04	185.32	165.31	156.29	151.77	192.34	139.13	252.66	233.42

Movement, Approach, & Intersection Results

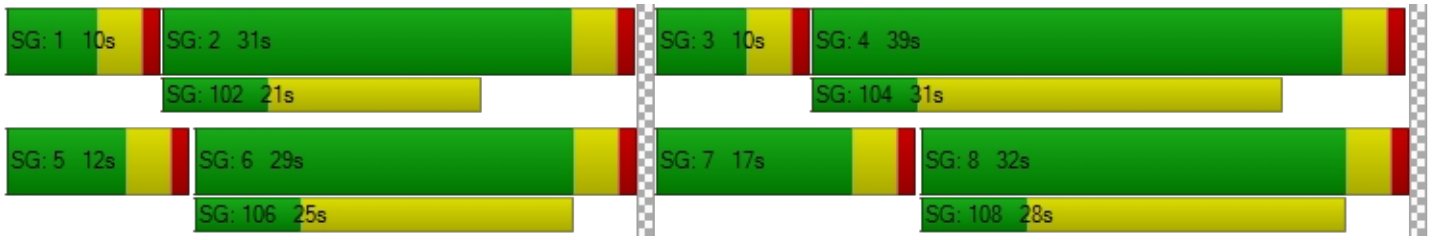
d_M, Delay for Movement [s/veh]	6.85	15.81	16.23	8.66	12.43	12.46	28.32	40.54	40.54	26.04	39.70	38.55
Movement LOS	A	B	B	A	B	B	C	D	D	C	D	D
d_A, Approach Delay [s/veh]	15.71			11.71			32.53			35.62		
Approach LOS	B			B			C			D		
d_I, Intersection Delay [s/veh]	20.78											
Intersection LOS	C											
Intersection V/C	0.605											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	34.72	34.72	34.72	34.72
l_p,int, Pedestrian LOS Score for Intersection	3.028	3.314	2.404	2.732
Crosswalk LOS	C	C	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	555	599	622	777
d_b, Bicycle Delay [s]	23.51	22.09	21.40	16.84
l_b,int, Bicycle LOS Score for Intersection	2.115	2.650	2.023	2.729
Bicycle LOS	B	B	B	B

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 4: Rustic Drive/Carbon Canyon Road at Chino Hills Parkway

Control Type:	Signalized	Delay (sec / veh):	32.0
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.748

Intersection Setup

Name	Carbon Canyon Road			Rustic Drive			Chino Hills Parkway			Chino Hills Parkway		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	1	0	0	1	0	1	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			No		

Volumes

Name	Carbon Canyon Road			Rustic Drive			Chino Hills Parkway			Chino Hills Parkway		
Base Volume Input [veh/h]	191	0	339	3	0	0	14	294	272	1136	664	3
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	191	0	339	3	0	0	14	294	272	1136	664	3
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	52	0	92	1	0	0	4	80	74	309	180	1
Total Analysis Volume [veh/h]	208	0	368	3	0	0	15	320	296	1235	722	3
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	0	8	0	0	4	0	5	2	0	1	6	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	0	6	0	0	6	0	6	6	0	6	6	0
Maximum Green [s]	0	30	0	0	30	0	30	30	0	30	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	32	0	0	32	0	10	29	0	59	78	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	0	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	21	0	0	18	0	0	11	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall		No			No		No	No		No	No	
Maximum Recall		No			No		No	No		No	No	
Pedestrian Recall		No			No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	L	C	R	L	C	C
C, Cycle Length [s]	120	120	120	120	120	120	120	120	120	120	120
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	17	17	17	17	17	2	41	41	49	88	88
g / C, Green / Cycle	0.15	0.15	0.15	0.15	0.15	0.02	0.34	0.34	0.41	0.73	0.73
(v / s)_i Volume / Saturation Flow Rate	0.12	0.10	0.10	0.00	0.00	0.01	0.09	0.16	0.39	0.20	0.20
s, saturation flow rate [veh/h]	1700	1800	1800	1700	1800	1700	3600	1800	3200	1800	1800
c, Capacity [veh/h]	279	261	261	115	261	35	1236	618	1317	1322	1322
d1, Uniform Delay [s]	49.93	48.81	48.81	43.90	0.00	58.04	28.39	30.96	33.81	5.30	5.30
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	3.93	3.45	3.45	0.09	0.00	8.15	0.51	2.65	3.90	0.51	0.51
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.74	0.70	0.70	0.03	0.00	0.43	0.26	0.48	0.94	0.27	0.27
d, Delay for Lane Group [s/veh]	53.85	52.26	52.26	43.99	0.00	66.19	28.90	33.61	37.72	5.82	5.82
Lane Group LOS	D	D	D	D	A	E	C	C	D	A	A
Critical Lane Group	Yes	No	No	No	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	6.37	5.50	5.50	0.08	0.00	0.53	3.43	7.19	17.52	2.89	2.89
50th-Percentile Queue Length [ft/ln]	159.29	137.43	137.43	2.00	0.00	13.24	85.64	179.73	438.12	72.33	72.33
95th-Percentile Queue Length [veh/ln]	10.51	9.34	9.34	0.14	0.00	0.95	6.17	11.59	24.39	5.21	5.21
95th-Percentile Queue Length [ft/ln]	262.79	233.56	233.56	3.59	0.00	23.83	154.16	289.67	609.76	130.19	130.19

Movement, Approach, & Intersection Results

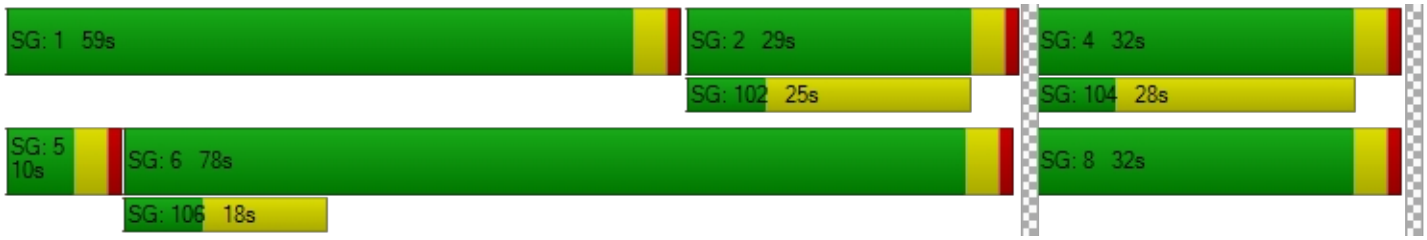
d_M, Delay for Movement [s/veh]	53.85	52.26	52.26	43.99	0.00	0.00	66.19	28.90	33.61	37.72	5.82	5.82
Movement LOS	D	D	D	D	A	A	E	C	C	D	A	A
d_A, Approach Delay [s/veh]	52.84			43.99			32.00			25.92		
Approach LOS	D			D			C			C		
d_I, Intersection Delay [s/veh]	32.03											
Intersection LOS	C											
Intersection V/C	0.748											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	0.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	49.49	49.49	49.49	0.00
l_p,int, Pedestrian LOS Score for Intersection	2.724	1.961	3.016	0.000
Crosswalk LOS	B	A	C	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	467	467	417	1234
d_b, Bicycle Delay [s]	35.25	35.25	37.59	8.81
l_b,int, Bicycle LOS Score for Intersection	2.510	1.565	2.080	3.177
Bicycle LOS	B	A	B	C

Sequence

Ring 1	1	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 5: Peyton Drive at Chino Hills Parkway

Control Type:	Signalized	Delay (sec / veh):	37.0
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.785

Intersection Setup

Name	Peyton Drive			Peyton Drive			Chino Hills Parkway			Chino Hills Parkway		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	1	1	0	0	1	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Peyton Drive			Peyton Drive			Chino Hills Parkway			Chino Hills Parkway		
Base Volume Input [veh/h]	531	347	261	149	188	294	153	379	129	179	899	216
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	531	347	261	149	188	294	153	379	129	179	899	216
Peak Hour Factor	0.9130	0.9130	0.9130	0.9130	0.9130	0.9130	0.9130	0.9130	0.9130	0.9130	0.9130	0.9130
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	145	95	71	41	51	81	42	104	35	49	246	59
Total Analysis Volume [veh/h]	582	380	286	163	206	322	168	415	141	196	985	237
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Overlap	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	3	8	0	7	4	4	5	2	0	1	6	0
Auxiliary Signal Groups						4,5						
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	6	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	30	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	1.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	33	48	0	17	32	32	12	32	0	13	33	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	7	0	7	0	0	7	0
Pedestrian Clearance [s]	0	24	0	0	21	21	0	21	0	0	21	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No	No	No	No		No	No	
Maximum Recall	No	No		No	No	No	No	No		No	No	
Pedestrian Recall	No	No		No	No	No	No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	R	L	C	C	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	23	25	25	12	14	26	8	48	48	9	49	49
g / C, Green / Cycle	0.21	0.22	0.22	0.11	0.13	0.24	0.07	0.44	0.44	0.08	0.44	0.44
(v / s)_i Volume / Saturation Flow Rate	0.18	0.20	0.17	0.10	0.06	0.18	0.05	0.16	0.15	0.06	0.27	0.13
s, saturation flow rate [veh/h]	3200	1800	1800	1700	3600	1800	3200	1800	1800	3200	3600	1800
c, Capacity [veh/h]	660	405	405	191	473	434	235	788	788	253	1597	798
d1, Uniform Delay [s]	42.40	41.20	39.92	47.96	44.05	38.60	49.88	20.73	20.41	49.74	23.47	19.63
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.14	0.11	0.50	0.50	0.11	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	4.09	6.24	3.02	10.17	0.63	3.29	4.02	1.32	1.16	5.03	1.80	0.95
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.88	0.88	0.76	0.85	0.44	0.74	0.71	0.37	0.34	0.77	0.62	0.30
d, Delay for Lane Group [s/veh]	46.48	47.45	42.94	58.13	44.68	41.89	53.90	22.05	21.57	54.77	25.26	20.58
Lane Group LOS	D	D	D	E	D	D	D	C	C	D	C	C
Critical Lane Group	Yes	No	No	No	No	Yes	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	7.98	9.94	8.13	4.91	2.63	8.37	2.39	5.21	4.72	2.82	9.96	4.06
50th-Percentile Queue Length [ft/ln]	199.57	248.61	203.17	122.84	65.71	209.26	59.69	130.37	117.89	70.40	248.94	101.47
95th-Percentile Queue Length [veh/ln]	12.62	15.12	12.80	8.55	4.73	13.12	4.30	8.96	8.28	5.07	15.13	7.31
95th-Percentile Queue Length [ft/ln]	315.41	377.91	320.06	213.73	118.27	327.88	107.45	224.00	206.93	126.72	378.32	182.64

Movement, Approach, & Intersection Results

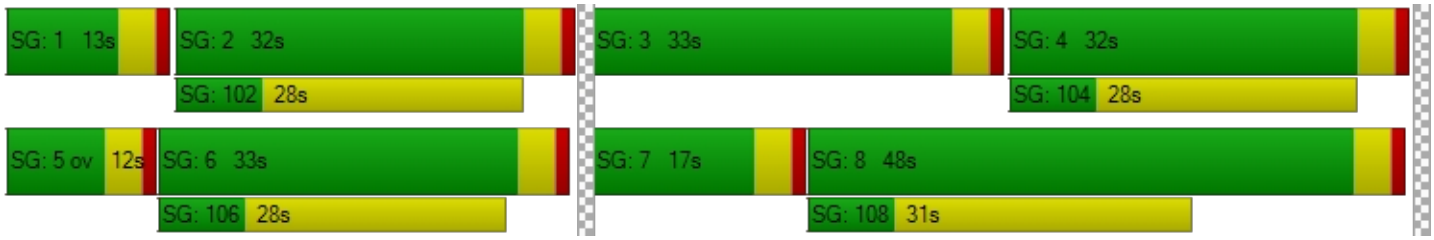
d_M, Delay for Movement [s/veh]	46.48	47.16	42.94	58.13	44.68	41.89	53.90	21.90	21.57	54.77	25.26	20.58
Movement LOS	D	D	D	E	D	D	D	C	C	D	C	C
d_A, Approach Delay [s/veh]	45.88			46.56			29.27			28.56		
Approach LOS	D			D			C			C		
d_I, Intersection Delay [s/veh]	37.03											
Intersection LOS	D											
Intersection V/C	0.785											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	44.58	44.58	44.58	44.58
l_p,int, Pedestrian LOS Score for Intersection	2.753	2.702	2.887	2.921
Crosswalk LOS	C	B	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	800	509	509	527
d_b, Bicycle Delay [s]	19.82	30.59	30.59	29.85
l_b,int, Bicycle LOS Score for Intersection	2.589	2.130	2.157	2.729
Bicycle LOS	B	B	B	B

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 6: Peyton Drive at Woodview Road

Control Type:	All-way stop	Delay (sec / veh):	12.9
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.524

Intersection Setup

Name	Peyton Drive			Peyton Drive			Woodview Road			Woodview Road		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	0	0	1	1	0	0	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			45.00			40.00			35.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			No			No		

Volumes

Name	Peyton Drive			Peyton Drive			Woodview Road			Woodview Road		
Base Volume Input [veh/h]	11	168	4	113	103	42	57	12	12	2	10	208
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	11	168	4	113	103	42	57	12	12	2	10	208
Peak Hour Factor	0.9500	0.9500	0.9500	0.6750	0.9500	0.6750	0.6750	0.6750	0.9500	0.9500	0.6750	0.6750
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	44	1	42	27	16	21	4	3	1	4	77
Total Analysis Volume [veh/h]	12	177	4	167	108	62	84	18	13	2	15	308
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	487	524	507	546	612	476	532	515	617
Degree of Utilization, x	0.02	0.35	0.33	0.20	0.10	0.18	0.06	0.00	0.52

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	0.08	1.53	1.42	0.73	0.34	0.63	0.19	0.01	3.04
95th-Percentile Queue Length [ft]	1.89	38.22	35.61	18.24	8.42	15.87	4.63	0.29	76.10
Approach Delay [s/veh]	12.97		11.76			11.34		14.73	
Approach LOS	B		B			B		B	
Intersection Delay [s/veh]	12.95								
Intersection LOS	B								

Intersection Level Of Service Report
Intersection 7: Pipeline Avenue at Woodview Road

Control Type:	Two-way stop	Delay (sec / veh):	135.3
Analysis Method:	HCM 7th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.806

Intersection Setup

Name	Pipeline Avenue		Pipeline Avenue		Woodview Road	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	40.00		30.00		35.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name	Pipeline Avenue		Pipeline Avenue		Woodview Road	
Base Volume Input [veh/h]	184	344	213	33	73	147
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	184	344	213	33	73	147
Peak Hour Factor	0.7200	0.7200	0.7200	0.7200	0.7200	0.7200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	64	119	74	11	25	51
Total Analysis Volume [veh/h]	256	478	296	46	101	204
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.21	0.00	0.00	0.00	0.81	0.28
d_M, Delay for Movement [s/veh]	8.29	0.00	0.00	0.00	135.34	111.61
Movement LOS	A	A	A	A	F	F
95th-Percentile Queue Length [veh/ln]	0.50	0.50	0.00	0.00	12.35	12.35
95th-Percentile Queue Length [ft/ln]	12.40	12.40	0.00	0.00	308.80	308.80
d_A, Approach Delay [s/veh]	2.89		0.00		119.47	
Approach LOS	A		A		F	
d_I, Intersection Delay [s/veh]	27.92					
Intersection LOS	F					

Intersection Level Of Service Report
Intersection 8: Pipeline Avenue at Soquel Canyon Parkway

Control Type:	All-way stop	Delay (sec / veh):	34.6
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.958

Intersection Setup

Name	Pipeline Avenue		Soquel Canyon Parkway		Soquel Canyon Parkway	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	1	0	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	40.00		45.00		50.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		No	

Volumes

Name	Pipeline Avenue		Soquel Canyon Parkway		Soquel Canyon Parkway	
Base Volume Input [veh/h]	352	23	42	221	195	347
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	352	23	42	221	195	347
Peak Hour Factor	0.7350	0.7350	0.7350	0.7350	0.7350	0.7350
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	120	8	14	75	66	118
Total Analysis Volume [veh/h]	479	31	57	301	265	472
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	532	428	457	457	457	481	481	534
Degree of Utilization, x	0.96	0.13	0.22	0.22	0.22	0.28	0.28	0.88

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	12.49	0.46	0.83	0.83	0.83	1.11	1.11	9.97
95th-Percentile Queue Length [ft]	312.23	11.41	20.73	20.73	20.73	27.84	27.84	249.13
Approach Delay [s/veh]	55.02	12.73				31.07		
Approach LOS	F	B				D		
Intersection Delay [s/veh]	34.59							
Intersection LOS	D							

Intersection Level Of Service Report

Intersection 9: Soquel Canyon Parkway at Los Serranos Country Club Drive/Butterfield Ranch Road

Control Type:	Signalized	Delay (sec / veh):	34.8
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.619

Intersection Setup

Name	Soquel Canyon Parkway			Soquel Canyon Parkway			Lo Se			Butterfield Ranch Road		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	0	1	0	0	1	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Soquel Canyon Parkway			Soquel Canyon Parkway			Lo Se			Butterfield Ranch Road		
Base Volume Input [veh/h]	12	688	113	88	309	223	295	111	17	242	208	428
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	12	688	113	88	309	223	295	111	17	242	208	428
Peak Hour Factor	0.7170	0.7170	0.7170	0.7170	0.7170	0.7170	0.7170	0.7170	0.7170	0.7170	0.7170	0.7170
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	4	240	39	31	108	78	103	39	6	84	73	149
Total Analysis Volume [veh/h]	17	960	158	123	431	311	411	155	24	338	290	597
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Overlap
Signal Group	1	6	0	5	2	0	3	8	0	7	4	4
Auxiliary Signal Groups												4,5
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	6
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	30
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	3.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	1.0
Split [s]	16	39	0	11	34	0	31	39	0	31	39	39
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	3.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	7
Pedestrian Clearance [s]	0	28	0	0	18	0	0	28	0	0	28	28
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	2.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	2.0
Minimum Recall	No	No		No	No		No	No		No	No	No
Maximum Recall	No	No		No	No		No	No		No	No	No
Pedestrian Recall	No	No		No	No		No	No		No	No	No
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	C	L	C	C	L	C	R
C, Cycle Length [s]	120	120	120	120	120	120	120	120	120	120	120	120
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	0.00
g_i, Effective Green Time [s]	3	56	56	7	60	60	18	26	26	15	23	34
g / C, Green / Cycle	0.02	0.47	0.47	0.06	0.50	0.50	0.15	0.22	0.22	0.13	0.19	0.28
(v / s)_i Volume / Saturation Flow Rate	0.01	0.21	0.20	0.04	0.12	0.17	0.13	0.05	0.05	0.11	0.16	0.17
s, saturation flow rate [veh/h]	1700	3600	1800	3200	3600	1800	3200	1800	1800	3200	1800	3600
c, Capacity [veh/h]	38	1674	837	189	1805	902	480	389	389	406	347	1027
d1, Uniform Delay [s]	57.93	21.72	21.60	55.28	16.96	18.04	49.77	38.88	38.80	51.17	46.62	36.77
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	7.82	0.87	1.67	3.75	0.31	1.05	4.53	0.31	0.29	4.50	5.30	0.52
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.44	0.45	0.44	0.65	0.24	0.34	0.86	0.23	0.23	0.83	0.84	0.58
d, Delay for Lane Group [s/veh]	65.75	22.59	23.28	59.02	17.27	19.09	54.30	39.18	39.09	55.67	51.92	37.29
Lane Group LOS	E	C	C	E	B	B	D	D	D	E	D	D
Critical Lane Group	No	Yes	No	Yes	No	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.59	7.28	7.29	1.92	3.44	5.42	6.31	2.27	2.18	5.21	8.82	7.58
50th-Percentile Queue Length [ft/ln]	14.84	182.05	182.22	48.03	85.90	135.46	157.65	56.76	54.41	130.27	220.48	189.42
95th-Percentile Queue Length [veh/ln]	1.07	11.71	11.72	3.46	6.18	9.24	10.42	4.09	3.92	8.95	13.69	12.09
95th-Percentile Queue Length [ft/ln]	26.72	292.68	292.90	86.46	154.62	230.90	260.61	102.16	97.94	223.86	342.24	302.27

Movement, Approach, & Intersection Results

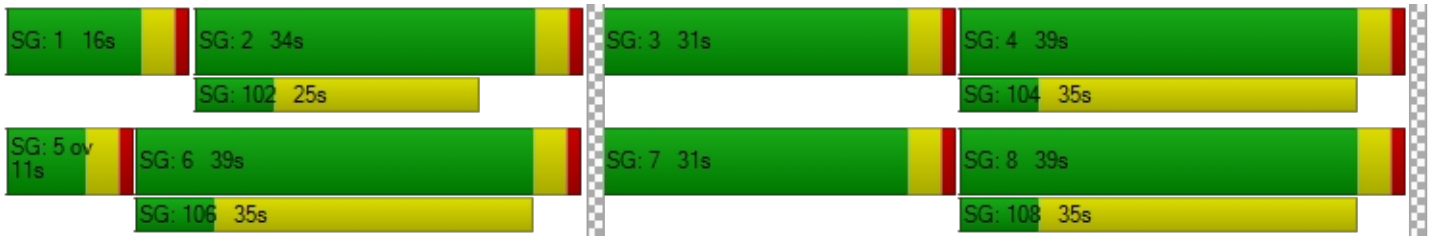
d_M, Delay for Movement [s/veh]	65.75	22.74	23.28	59.02	17.27	19.09	54.30	39.14	39.09	55.67	51.92	37.29
Movement LOS	E	C	C	E	B	B	D	D	D	E	D	D
d_A, Approach Delay [s/veh]	23.46			23.86			49.70			45.82		
Approach LOS	C			C			D			D		
d_I, Intersection Delay [s/veh]	34.79											
Intersection LOS	C											
Intersection V/C	0.619											

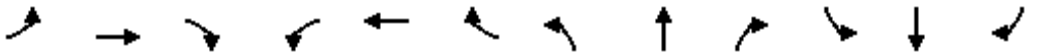
Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	49.52	49.52	49.52	49.52
l_p,int, Pedestrian LOS Score for Intersection	2.876	3.085	2.549	2.942
Crosswalk LOS	C	C	B	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	583	500	583	583
d_b, Bicycle Delay [s]	30.12	33.76	30.12	30.12
l_b,int, Bicycle LOS Score for Intersection	2.184	2.035	2.046	3.581
Bicycle LOS	B	B	B	D

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



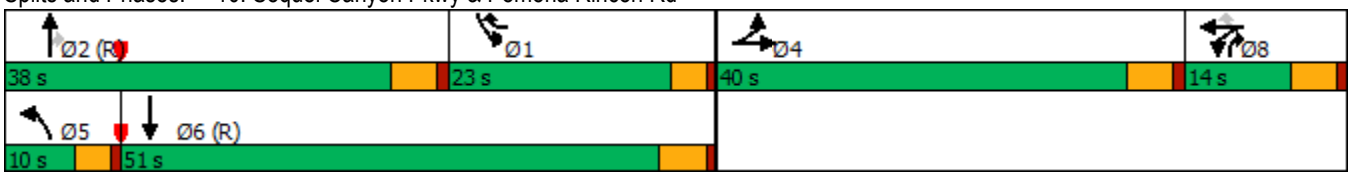


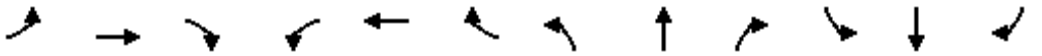
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	29	79	6	122	3	386	29	1144	313	420	490	53
Future Volume (vph)	29	79	6	122	3	386	29	1144	313	420	490	53
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	0.95	0.91	0.95	1.00	0.86	0.86	0.97	0.91	0.91
Frt		0.990			0.862	0.850		0.996	0.850		0.985	
Flt Protected	0.950			0.950	0.997		0.950			0.950		
Satd. Flow (prot)	1770	1844	0	1681	1457	1504	1770	4787	1362	3433	5009	0
Flt Permitted	0.950			0.950	0.997		0.950			0.950		
Satd. Flow (perm)	1770	1844	0	1681	1457	1504	1770	4787	1362	3433	5009	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3			285	309		3	387		19	
Link Speed (mph)		25			25			50			50	
Link Distance (ft)		560			625			594			526	
Travel Time (s)		15.3			17.0			8.1			7.2	
Peak Hour Factor	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65
Adj. Flow (vph)	45	122	9	188	5	594	45	1760	482	646	754	82
Shared Lane Traffic (%)				10%		48%			10%			
Lane Group Flow (vph)	45	131	0	169	309	309	45	1808	434	646	836	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2	1	1	2	1	1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100		20	100	20	20	100	20	20	100	
Trailing Detector (ft)	0	0		0	0	0	0	0	0	0	0	
Detector 1 Position(ft)	0	0		0	0	0	0	0	0	0	0	
Detector 1 Size(ft)	20	6		20	6	20	20	6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Split	NA		Split	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	
Protected Phases	4	4		8	8	1	5	2	8	1	6	
Permitted Phases						8			2			
Detector Phase	4	4		8	8	1	5	2	8	1	6	
Switch Phase												
Minimum Initial (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Split (s)	40.0	40.0		11.0	11.0	10.0	10.0	30.0	11.0	10.0	23.0	
Total Split (s)	40.0	40.0		14.0	14.0	23.0	10.0	38.0	14.0	23.0	51.0	
Total Split (%)	34.8%	34.8%		12.2%	12.2%	20.0%	8.7%	33.0%	12.2%	20.0%	44.3%	
Maximum Green (s)	35.0	35.0		9.0	9.0	19.0	6.0	33.0	9.0	19.0	46.0	
Yellow Time (s)	4.0	4.0		4.0	4.0	3.0	3.0	4.0	4.0	3.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0	4.0	4.0	5.0	5.0	4.0	5.0	
Lead/Lag						Lag	Lead	Lead		Lag	Lag	
Lead-Lag Optimize?						Yes	Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	None		None	None	None	None	C-Max	None	None	C-Max	
Walk Time (s)	7.0	7.0						7.0			7.0	
Flash Dont Walk (s)	28.0	28.0						18.0			11.0	
Pedestrian Calls (#/hr)	5	5						5			5	
Act Effct Green (s)	16.7	16.7		22.7	22.7	42.7	7.1	37.6	65.3	19.0	51.5	
Actuated g/C Ratio	0.15	0.15		0.20	0.20	0.37	0.06	0.33	0.57	0.17	0.45	
v/c Ratio	0.18	0.49		0.51	0.60	0.41	0.42	1.15	0.46	1.14	0.37	
Control Delay	40.5	48.0		49.4	12.8	3.5	63.9	113.0	4.7	126.0	22.0	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	40.5	48.0		49.4	12.8	3.5	63.9	113.0	4.7	126.0	22.0	
LOS	D	D		D	B	A	E	F	A	F	C	
Approach Delay		46.0			17.0			91.5			67.3	
Approach LOS		D			B			F			E	
Queue Length 50th (ft)	31	91		115	15	0	32	~598	16	~288	147	
Queue Length 95th (ft)	37	84		#198	16	0	52	#443	10	#223	130	
Internal Link Dist (ft)		480			545			514			446	
Turn Bay Length (ft)												
Base Capacity (vph)	538	563		332	516	752	108	1567	940	567	2254	
Starvation Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.08	0.23		0.51	0.60	0.41	0.42	1.15	0.46	1.14	0.37	

Intersection Summary			
Area Type:	Other		
Cycle Length: 115			
Actuated Cycle Length: 115			
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green			
Natural Cycle: 115			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.15			
Intersection Signal Delay: 69.9		Intersection LOS: E	
Intersection Capacity Utilization 64.6%		ICU Level of Service C	
Analysis Period (min) 15			
~ Volume exceeds capacity, queue is theoretically infinite.			
Queue shown is maximum after two cycles.			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 10: Soquel Canyon Pkwy & Pomona Rincon Rd





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	29	79	6	122	3	386	29	1144	313	420	490	53
Future Volume (veh/h)	29	79	6	122	3	386	29	1144	313	420	490	53
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	45	122	9	127	0	663	45	1760	482	646	754	82
Peak Hour Factor	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	167	161	12	139	0	1412	71	1610	579	1269	2915	315
Arrive On Green	0.09	0.09	0.09	0.08	0.00	0.08	0.04	0.29	0.29	0.37	0.62	0.62
Sat Flow, veh/h	1781	1721	127	1781	0	3170	1781	5611	1585	3456	4678	505
Grp Volume(v), veh/h	45	0	131	127	0	663	45	1760	482	646	547	289
Grp Sat Flow(s),veh/h/ln	1781	0	1848	1781	0	1585	1781	1870	1585	1728	1702	1779
Q Serve(g_s), s	2.7	0.0	8.0	8.1	0.0	0.0	2.9	33.0	31.9	16.7	8.3	8.4
Cycle Q Clear(g_c), s	2.7	0.0	8.0	8.1	0.0	0.0	2.9	33.0	31.9	16.7	8.3	8.4
Prop In Lane	1.00		0.07	1.00		1.00	1.00		1.00	1.00		0.28
Lane Grp Cap(c), veh/h	167	0	173	139	0	1412	71	1610	579	1269	2121	1109
V/C Ratio(X)	0.27	0.00	0.76	0.91	0.00	0.47	0.64	1.09	0.83	0.51	0.26	0.26
Avail Cap(c_a), veh/h	542	0	562	139	0	1412	93	1610	579	1269	2121	1109
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	48.5	0.0	50.8	52.6	0.0	22.4	54.4	41.0	33.3	28.3	9.7	9.7
Incr Delay (d2), s/veh	0.9	0.0	6.6	50.4	0.0	0.2	9.1	52.4	13.2	0.3	0.3	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	0.0	4.0	5.6	0.0	6.4	1.4	22.1	15.3	6.6	2.8	3.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	49.3	0.0	57.5	103.0	0.0	22.6	63.4	93.4	46.5	28.7	10.0	10.3
LnGrp LOS	D	A	E	F	A	C	E	F	D	C	B	B
Approach Vol, veh/h		176			790			2287			1482	
Approach Delay, s/veh		55.4			35.5			82.9			18.2	
Approach LOS		E			D			F			B	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	47.2	38.0		15.8	8.6	76.7		14.0				
Change Period (Y+Rc), s	5.0	* 5		5.0	4.0	5.0		5.0				
Max Green Setting (Gmax), s	19.0	* 33		35.0	6.0	46.0		9.0				
Max Q Clear Time (g_c+I1), s	18.7	35.0		10.0	4.9	10.4		10.1				
Green Ext Time (p_c), s	0.1	0.0		0.9	0.0	5.4		0.0				

Intersection Summary			
HCM 6th Ctrl Delay		53.7	
HCM 6th LOS		D	

Notes

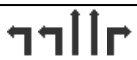
User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection Level Of Service Report
Intersection 11: Peyton Drive at Grand Avenue

Control Type:	Signalized	Delay (sec / veh):	33.2
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.633

Intersection Setup

Name	Peyton Drive			Peyton Drive			Grand Avenue			Grand Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	1	0	0	1	0	1	1	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Peyton Drive			Peyton Drive			Grand Avenue			Grand Avenue		
Base Volume Input [veh/h]	204	557	129	121	656	230	199	449	241	191	680	88
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	204	557	129	121	656	230	199	449	241	191	680	88
Peak Hour Factor	0.9010	0.9010	0.9010	0.9010	0.9010	0.9010	0.9010	0.9010	0.9010	0.9010	0.9010	0.9010
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	57	155	36	34	182	64	55	125	67	53	189	24
Total Analysis Volume [veh/h]	226	618	143	134	728	255	221	498	267	212	755	98
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	105
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	1	6	0	5	2	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	14	39	0	10	35	0	13	42	0	14	43	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	28	0	0	24	0	0	31	0	0	28	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	C	L	C	R	L	C	R
C, Cycle Length [s]	105	105	105	105	105	105	105	105	105	105	105	105
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	9	49	49	6	45	45	9	25	25	9	25	25
g / C, Green / Cycle	0.09	0.46	0.46	0.06	0.43	0.43	0.09	0.24	0.24	0.08	0.24	0.24
(v / s)_i Volume / Saturation Flow Rate	0.07	0.11	0.08	0.04	0.19	0.17	0.07	0.14	0.15	0.07	0.21	0.05
s, saturation flow rate [veh/h]	3200	5400	1800	3200	3600	1800	3200	3600	1800	3200	3600	1800
c, Capacity [veh/h]	286	2496	832	186	1551	775	276	872	436	273	868	434
d1, Uniform Delay [s]	46.89	17.16	16.51	48.68	20.94	20.58	47.13	35.02	35.44	47.09	38.30	32.01
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	4.84	0.24	0.45	5.24	0.89	1.54	5.29	0.59	1.40	4.72	2.85	0.26
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.79	0.25	0.17	0.72	0.43	0.40	0.80	0.57	0.61	0.78	0.87	0.23
d, Delay for Lane Group [s/veh]	51.73	17.40	16.96	53.92	21.83	22.13	52.42	35.62	36.83	51.82	41.14	32.27
Lane Group LOS	D	B	B	D	C	C	D	D	D	D	D	C
Critical Lane Group	Yes	No	No	No	Yes	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	3.07	3.03	2.09	1.86	5.86	5.48	3.03	5.63	6.20	2.88	9.55	2.03
50th-Percentile Queue Length [ft/ln]	76.85	75.70	52.23	46.41	146.38	136.90	75.67	140.76	154.99	72.08	238.69	50.71
95th-Percentile Queue Length [veh/ln]	5.53	5.45	3.76	3.34	9.82	9.31	5.45	9.52	10.28	5.19	14.62	3.65
95th-Percentile Queue Length [ft/ln]	138.34	136.27	94.01	83.54	245.58	232.84	136.21	238.04	257.08	129.75	365.38	91.28

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	51.73	17.40	16.96	53.92	21.85	22.13	52.42	35.62	36.83	51.82	41.14	32.27
Movement LOS	D	B	B	D	C	C	D	D	D	D	D	C
d_A, Approach Delay [s/veh]	25.20			25.76			39.71			42.45		
Approach LOS	C			C			D			D		
d_I, Intersection Delay [s/veh]	33.22											
Intersection LOS	C											
Intersection V/C	0.633											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	42.11	42.11	42.11	42.11
l_p,int, Pedestrian LOS Score for Intersection	3.094	2.983	2.911	2.957
Crosswalk LOS	C	C	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	666	590	723	742
d_b, Bicycle Delay [s]	23.36	26.10	21.40	20.77
l_b,int, Bicycle LOS Score for Intersection	2.102	2.174	2.373	2.438
Bicycle LOS	B	B	B	B

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 12: Carbon Canyon Road at Fairway Drive/Ginseng Lane

Control Type:	Two-way stop	Delay (sec / veh):	169.0
Analysis Method:	HCM 7th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.687

Intersection Setup

Name	Carbon Canyon Road			Carbon Canyon Road			Fairway Drive			Ginseng Lane		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	0	0	0	1	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	45.00			45.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			No			No		

Volumes

Name	Carbon Canyon Road			Carbon Canyon Road			Fairway Drive			Ginseng Lane		
Base Volume Input [veh/h]	21	384	0	1	1336	24	33	0	28	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	21	384	0	1	1336	24	33	0	28	0	0	0
Peak Hour Factor	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	6	102	0	0	355	6	9	0	7	0	0	0
Total Analysis Volume [veh/h]	22	409	0	1	1421	26	35	0	30	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Free	Free	Stop	Stop
Flared Lane				No
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance			No	No
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.05	0.00	0.00	0.00	0.01	0.00	0.69	0.00	0.18	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	13.07	0.00	0.00	8.13	0.00	0.00	169.05	152.19	31.77	93.63	59.84	10.60
Movement LOS	B	A	A	A	A	A	F	F	D	F	F	B
95th-Percentile Queue Length [veh/ln]	0.15	0.00	0.00	0.00	0.00	0.00	2.76	2.76	0.65	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	3.69	0.00	0.00	0.07	0.00	0.00	69.04	69.04	16.15	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	0.67			0.01			105.69			54.69		
Approach LOS	A			A			F			F		
d_I, Intersection Delay [s/veh]	3.69											
Intersection LOS	F											

Intersection Level Of Service Report
Intersection 13: Carbon Canyon Road at Canyon Hills Road

Control Type:	Two-way stop	Delay (sec / veh):	75.1
Analysis Method:	HCM 7th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.370

Intersection Setup

Name	Carbon Canyon Road		Carbon Canyon Road		Canyon Hills Road	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	1	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	45.00		45.00		25.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name	Carbon Canyon Road		Carbon Canyon Road		Canyon Hills Road	
Base Volume Input [veh/h]	11	298	1333	22	34	31
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	11	298	1333	22	34	31
Peak Hour Factor	0.9610	0.9610	0.9610	0.9610	0.9610	0.9610
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	78	347	6	9	8
Total Analysis Volume [veh/h]	11	310	1387	23	35	32
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.00	0.01	0.00	0.37	0.19
d_M, Delay for Movement [s/veh]	12.62	0.00	0.00	0.00	75.11	58.00
Movement LOS	B	A	A	A	F	F
95th-Percentile Queue Length [veh/ln]	0.07	0.00	0.00	0.00	2.68	2.68
95th-Percentile Queue Length [ft/ln]	1.74	0.00	0.00	0.00	66.93	66.93
d_A, Approach Delay [s/veh]	0.43		0.00		66.94	
Approach LOS	A		A		F	
d_I, Intersection Delay [s/veh]	2.57					
Intersection LOS	F					

Intersection Level Of Service Report
Intersection 1: Peyton Drive at Chino Avenue

Control Type:	Signalized	Delay (sec / veh):	31.0
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.558

Intersection Setup

Name	Peyton Drive			Peyton Drive			Chino Avenue			Chino Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	0	1	0	0	1	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Peyton Drive			Peyton Drive			Chino Avenue			Chino Avenue		
Base Volume Input [veh/h]	114	631	180	324	816	148	91	177	120	136	139	268
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	114	631	180	324	816	148	91	177	120	136	139	268
Peak Hour Factor	0.9570	0.9570	0.9570	0.9570	0.9570	0.9570	0.9570	0.9570	0.9570	0.9570	0.9570	0.9570
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	30	165	47	85	213	39	24	46	31	36	36	70
Total Analysis Volume [veh/h]	119	659	188	339	853	155	95	185	125	142	145	280
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	1	6	0	5	2	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	11	35	0	20	44	0	15	39	0	16	40	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	24	0	0	24	0	0	28	0	0	28	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	C	L	C	C	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	6	53	53	14	61	61	8	16	16	11	20	20
g / C, Green / Cycle	0.05	0.48	0.48	0.12	0.55	0.55	0.07	0.15	0.15	0.10	0.18	0.18
(v / s)_i Volume / Saturation Flow Rate	0.04	0.16	0.15	0.11	0.19	0.18	0.06	0.05	0.07	0.08	0.04	0.16
s, saturation flow rate [veh/h]	3200	3600	1800	3200	3600	1800	1700	3600	1800	1700	3600	1800
c, Capacity [veh/h]	174	1728	864	400	1982	991	120	539	270	170	645	323
d1, Uniform Delay [s]	51.13	17.72	17.55	47.13	13.70	13.61	50.39	41.95	42.77	48.66	38.64	43.91
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	4.69	0.52	0.96	5.01	0.47	0.90	11.16	0.38	1.24	10.23	0.17	7.06
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.68	0.33	0.32	0.85	0.34	0.33	0.79	0.34	0.46	0.84	0.22	0.87
d, Delay for Lane Group [s/veh]	55.82	18.24	18.51	52.14	14.17	14.51	61.55	42.33	44.01	58.90	38.81	50.97
Lane Group LOS	E	B	B	D	B	B	E	D	D	E	D	D
Critical Lane Group	No	Yes	No	Yes	No	No	Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	1.72	4.56	4.40	4.80	4.66	4.61	2.94	2.28	3.20	4.30	1.69	8.00
50th-Percentile Queue Length [ft/ln]	43.06	114.11	109.96	120.10	116.40	115.23	73.54	57.06	79.95	107.52	42.34	199.95
95th-Percentile Queue Length [veh/ln]	3.10	8.07	7.84	8.40	8.19	8.13	5.29	4.11	5.76	7.70	3.05	12.64
95th-Percentile Queue Length [ft/ln]	77.50	201.70	195.94	209.96	204.86	203.26	132.37	102.70	143.92	192.55	76.21	315.90

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	55.82	18.27	18.51	52.14	14.24	14.51	61.55	42.33	44.01	58.90	38.81	50.97
Movement LOS	E	B	B	D	B	B	E	D	D	E	D	D
d_A, Approach Delay [s/veh]	22.94			23.81			47.36			49.84		
Approach LOS	C			C			D			D		
d_I, Intersection Delay [s/veh]	30.95											
Intersection LOS	C											
Intersection V/C	0.558											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	44.58	44.58	44.58	44.58
l_p,int, Pedestrian LOS Score for Intersection	2.989	3.025	2.718	2.782
Crosswalk LOS	C	C	B	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	563	727	636	654
d_b, Bicycle Delay [s]	28.39	22.29	25.59	24.91
l_b,int, Bicycle LOS Score for Intersection	2.091	2.300	1.782	2.027
Bicycle LOS	B	B	A	B

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 2: Gateway Village/Boys Republic Drive at Grand Avenue

Control Type:	Signalized	Delay (sec / veh):	152.9
Analysis Method:	HCM 7th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.354

Intersection Setup

Name	Boys Republic Drive			Gateway Village			Grand Avenue			Grand Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	1	1	0	0	1	0	0	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			No		

Volumes

Name	Boys Republic Drive			Gateway Village			Grand Avenue			Grand Avenue		
Base Volume Input [veh/h]	35	30	650	246	48	65	103	1042	58	765	1062	119
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	35	30	650	246	48	65	103	1042	58	765	1062	119
Peak Hour Factor	0.9590	0.9590	0.9590	0.9590	0.9590	0.9590	0.9590	0.9590	0.9590	0.9590	0.9590	0.9590
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	9	8	169	64	13	17	27	272	15	199	277	31
Total Analysis Volume [veh/h]	36	31	678	257	50	68	107	1087	60	798	1107	124
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Split	Split	Split	Split	Split	Split	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	0	8	0	0	4	0	5	2	0	1	6	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	0	6	0	0	6	0	6	6	0	6	6	0
Maximum Green [s]	0	30	0	0	30	0	30	30	0	30	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	19	0	0	35	0	13	25	0	41	53	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	0	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	24	0	0	14	0	0	11	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall		No			No		No	No		No	No	
Maximum Recall		No			No		No	No		No	No	
Pedestrian Recall		No			No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	R	L	C	L	C	C	L	C	C
C, Cycle Length [s]	120	120	120	120	120	120	120	120	120	120
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	30	30	16	16	9	21	21	37	49	49
g / C, Green / Cycle	0.25	0.25	0.13	0.13	0.08	0.18	0.18	0.31	0.41	0.41
(v / s)_i Volume / Saturation Flow Rate	0.04	0.38	0.11	0.11	0.06	0.21	0.22	0.47	0.23	0.23
s, saturation flow rate [veh/h]	1700	1800	1700	1700	1700	3600	1800	1700	3600	1800
c, Capacity [veh/h]	424	449	226	226	128	635	318	524	1474	737
d1, Uniform Delay [s]	35.21	45.05	50.82	50.64	54.77	49.42	49.42	41.51	27.09	27.13
k, delay calibration	0.11	0.50	0.11	0.11	0.11	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.17	241.36	8.29	7.15	13.27	102.36	124.84	244.96	1.52	3.04
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.16	1.51	0.84	0.82	0.84	1.19	1.22	1.52	0.56	0.56
d, Delay for Lane Group [s/veh]	35.38	286.41	59.11	57.79	68.04	151.78	174.26	286.48	28.60	30.17
Lane Group LOS	D	F	E	E	E	F	F	F	C	C
Critical Lane Group	No	Yes	Yes	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	1.56	43.30	6.10	5.84	3.66	18.52	20.50	50.93	9.23	9.60
50th-Percentile Queue Length [ft/ln]	39.08	1082.44	152.39	146.07	91.56	462.94	512.53	1273.35	230.72	240.03
95th-Percentile Queue Length [veh/ln]	2.81	65.94	10.14	9.81	6.59	27.85	30.72	77.78	14.21	14.68
95th-Percentile Queue Length [ft/ln]	70.34	1648.55	253.61	245.18	164.81	696.15	768.12	1944.42	355.28	367.07

Movement, Approach, & Intersection Results

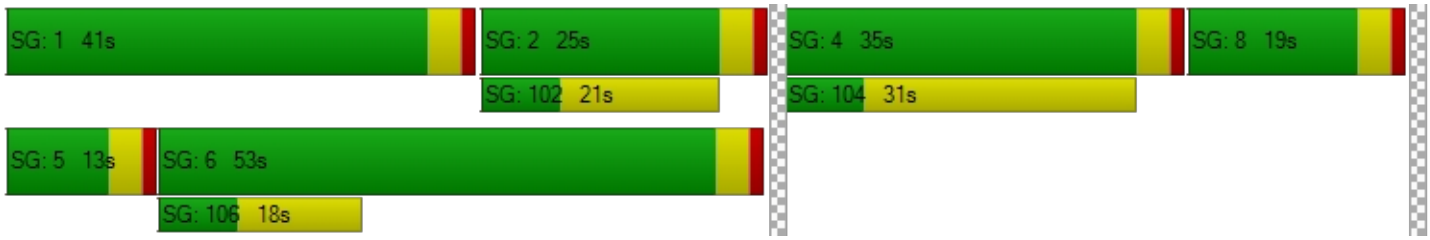
d_M, Delay for Movement [s/veh]	35.38	35.38	286.41	58.76	57.79	57.79	68.04	158.56	174.26	286.48	29.01	30.17
Movement LOS	D	D	F	E	E	E	E	F	F	F	C	C
d_A, Approach Delay [s/veh]	263.84			58.46			151.59			130.34		
Approach LOS	F			E			F			F		
d_I, Intersection Delay [s/veh]	152.86											
Intersection LOS	F											
Intersection V/C	1.354											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	0.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	49.51	49.51	49.51	0.00
l_p,int, Pedestrian LOS Score for Intersection	2.548	2.161	2.951	0.000
Crosswalk LOS	B	B	C	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	250	517	350	817
d_b, Bicycle Delay [s]	45.94	33.01	40.84	21.01
l_b,int, Bicycle LOS Score for Intersection	2.789	2.178	2.249	2.676
Bicycle LOS	C	B	B	B

Sequence

Ring 1	1	2	4	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 3: Peyton Drive at Eucalyptus Avenue

Control Type:	Signalized	Delay (sec / veh):	20.5
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.474

Intersection Setup

Name	Peyton Drive			Peyton Drive			Eucalyptus Avenue			Eucalyptus Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	1	1	0	0	1	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Peyton Drive			Peyton Drive			Eucalyptus Avenue			Eucalyptus Avenue		
Base Volume Input [veh/h]	26	455	168	204	588	294	193	250	21	160	240	196
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	26	455	168	204	588	294	193	250	21	160	240	196
Peak Hour Factor	0.9490	0.9490	0.9490	0.9490	0.9490	0.9490	0.9490	0.9490	0.9490	0.9490	0.9490	0.9490
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	7	120	44	54	155	77	51	66	6	42	63	52
Total Analysis Volume [veh/h]	27	479	177	215	620	310	203	263	22	169	253	207
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal Group	1	6	0	5	2	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	6	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	10	29	0	10	29	0	16	41	0	10	35	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	18	0	0	14	0	0	21	0	0	24	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		Yes	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	R	L	C	C	L	C	R
C, Cycle Length [s]	90	90	90	90	90	90	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	0.00	0.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	55	45	45	55	48	48	27	27	17	27	17	17
g / C, Green / Cycle	0.61	0.50	0.50	0.61	0.53	0.53	0.30	0.30	0.19	0.30	0.19	0.19
(v / s)_i Volume / Saturation Flow Rate	0.02	0.12	0.12	0.13	0.17	0.17	0.06	0.06	0.16	0.10	0.14	0.12
s, saturation flow rate [veh/h]	1700	3600	1800	1700	3600	1800	1700	1700	1800	1700	1800	1800
c, Capacity [veh/h]	973	1794	897	1023	1914	957	415	520	341	266	339	339
d1, Uniform Delay [s]	6.96	12.95	12.86	7.85	11.95	11.95	23.42	23.42	35.22	24.45	34.54	33.55
k, delay calibration	0.11	0.50	0.50	0.50	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.01	0.33	0.62	0.47	0.45	0.90	0.30	0.18	5.45	2.50	3.26	1.77
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.03	0.25	0.24	0.21	0.32	0.32	0.24	0.20	0.84	0.63	0.75	0.61
d, Delay for Lane Group [s/veh]	6.98	13.29	13.48	8.31	12.40	12.85	23.72	23.60	40.66	26.95	37.81	35.32
Lane Group LOS	A	B	B	A	B	B	C	C	D	C	D	D
Critical Lane Group	No	Yes	No	Yes	No	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	0.19	2.53	2.46	1.82	3.41	3.53	1.61	1.61	6.41	2.93	5.44	4.25
50th-Percentile Queue Length [ft/ln]	4.78	63.22	61.52	45.47	85.37	88.35	40.35	40.13	160.35	73.25	136.10	106.21
95th-Percentile Queue Length [veh/ln]	0.34	4.55	4.43	3.27	6.15	6.36	2.91	2.89	10.57	5.27	9.27	7.63
95th-Percentile Queue Length [ft/ln]	8.60	113.79	110.73	81.85	153.66	159.03	72.63	72.24	264.18	131.85	231.77	190.72

Movement, Approach, & Intersection Results

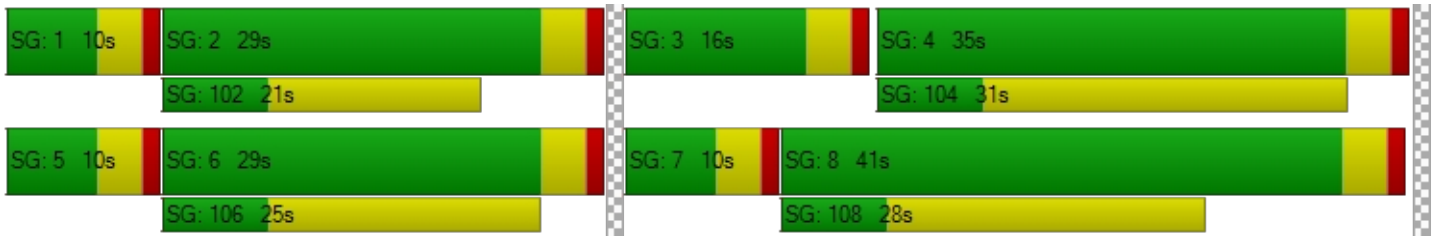
d_M, Delay for Movement [s/veh]	6.98	13.30	13.48	8.31	12.40	12.85	23.70	40.66	40.66	26.95	37.81	35.32
Movement LOS	A	B	B	A	B	B	C	D	D	C	D	D
d_A, Approach Delay [s/veh]	13.10			11.75			33.59			34.07		
Approach LOS	B			B			C			C		
d_I, Intersection Delay [s/veh]	20.45											
Intersection LOS	C											
Intersection V/C	0.474											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	34.72	34.72	34.72	34.72
l_p,int, Pedestrian LOS Score for Intersection	2.936	3.051	2.415	2.709
Crosswalk LOS	C	C	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	555	555	821	688
d_b, Bicycle Delay [s]	23.51	23.51	15.64	19.38
l_b,int, Bicycle LOS Score for Intersection	1.935	2.504	1.962	2.597
Bicycle LOS	A	B	A	B

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 4: Rustic Drive/Carbon Canyon Road at Chino Hills Parkway

Control Type:	Signalized	Delay (sec / veh):	35.6
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.804

Intersection Setup

Name	Carbon Canyon Road			Rustic Drive			Chino Hills Parkway			Chino Hills Parkway		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	1	0	0	1	0	1	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			No		

Volumes

Name	Carbon Canyon Road			Rustic Drive			Chino Hills Parkway			Chino Hills Parkway		
Base Volume Input [veh/h]	237	0	1289	12	0	0	9	695	169	467	657	11
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	237	0	1289	12	0	0	9	695	169	467	657	11
Peak Hour Factor	0.9730	0.9730	0.9730	0.9730	0.9730	0.9730	0.9730	0.9730	0.9730	0.9730	0.9730	0.9730
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	61	0	331	3	0	0	2	179	43	120	169	3
Total Analysis Volume [veh/h]	244	0	1325	12	0	0	9	714	174	480	675	11
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	0	8	0	0	4	0	5	2	0	1	6	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	0	6	0	0	6	0	6	6	0	6	6	0
Maximum Green [s]	0	30	0	0	30	0	30	30	0	30	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	58	0	0	58	0	10	29	0	23	42	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	0	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	21	0	0	18	0	0	11	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall		No			No		No	No		No	No	
Maximum Recall		No			No		No	No		No	No	
Pedestrian Recall		No			No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	L	C	R	L	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	45	45	45	45	45	1	35	35	18	52	52
g / C, Green / Cycle	0.41	0.41	0.41	0.41	0.41	0.01	0.32	0.32	0.17	0.47	0.47
(v / s)_i Volume / Saturation Flow Rate	0.14	0.37	0.37	0.01	0.00	0.01	0.20	0.10	0.15	0.19	0.19
s, saturation flow rate [veh/h]	1700	1800	1800	1700	1800	1700	3600	1800	3200	1800	1800
c, Capacity [veh/h]	720	729	729	131	729	24	1149	574	533	849	849
d1, Uniform Delay [s]	22.71	30.78	30.78	19.59	0.00	53.73	31.81	28.23	44.92	18.98	18.96
k, delay calibration	0.11	0.28	0.28	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.28	10.93	10.93	0.30	0.00	9.42	2.54	1.36	5.81	1.44	1.42
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.34	0.91	0.91	0.09	0.00	0.38	0.62	0.30	0.90	0.41	0.40
d, Delay for Lane Group [s/veh]	22.99	41.72	41.72	19.89	0.00	63.15	34.34	29.58	50.74	20.42	20.38
Lane Group LOS	C	D	D	B	A	E	C	C	D	C	C
Critical Lane Group	No	Yes	No	No	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	4.41	18.24	18.24	0.20	0.00	0.31	8.39	3.67	6.80	5.97	5.93
50th-Percentile Queue Length [ft/ln]	110.25	455.97	455.97	4.89	0.00	7.73	209.65	91.72	170.12	149.27	148.25
95th-Percentile Queue Length [veh/ln]	7.85	25.24	25.24	0.35	0.00	0.56	13.14	6.60	11.08	9.98	9.92
95th-Percentile Queue Length [ft/ln]	196.35	631.07	631.07	8.80	0.00	13.92	328.38	165.09	277.08	249.46	248.10

Movement, Approach, & Intersection Results

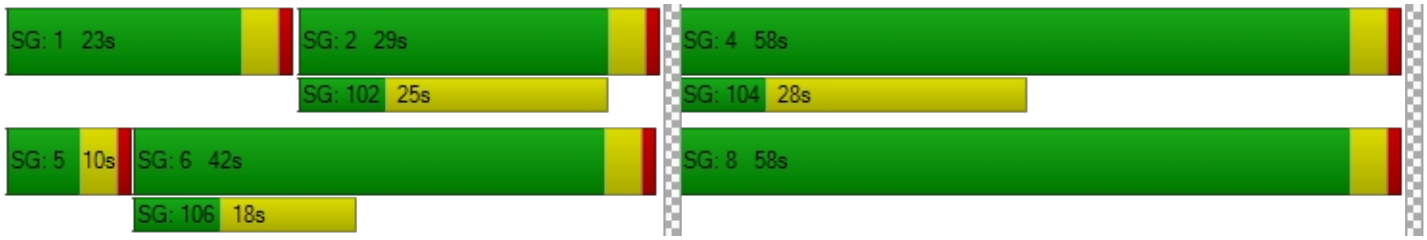
d_M, Delay for Movement [s/veh]	22.99	41.72	41.72	19.89	0.00	0.00	63.15	34.34	29.58	50.74	20.40	20.38
Movement LOS	C	D	D	B	A	A	E	C	C	D	C	C
d_A, Approach Delay [s/veh]	38.80			19.89			33.71			32.89		
Approach LOS	D			B			C			C		
d_I, Intersection Delay [s/veh]	35.59											
Intersection LOS	D											
Intersection V/C	0.804											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	0.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	44.54	44.54	44.54	0.00
l_p,int, Pedestrian LOS Score for Intersection	2.743	1.960	3.105	0.000
Crosswalk LOS	B	A	C	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	982	982	455	691
d_b, Bicycle Delay [s]	14.25	14.25	32.83	23.56
l_b,int, Bicycle LOS Score for Intersection	4.148	1.579	2.300	2.522
Bicycle LOS	D	A	B	B

Sequence

Ring 1	1	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 5: Peyton Drive at Chino Hills Parkway

Control Type:	Signalized	Delay (sec / veh):	51.6
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.979

Intersection Setup

Name	Peyton Drive			Peyton Drive			Chino Hills Parkway			Chino Hills Parkway		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	1	1	0	0	1	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Peyton Drive			Peyton Drive			Chino Hills Parkway			Chino Hills Parkway		
Base Volume Input [veh/h]	199	253	181	312	379	167	345	1103	461	233	745	274
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	199	253	181	312	379	167	345	1103	461	233	745	274
Peak Hour Factor	0.9720	0.9720	0.9720	0.9720	0.9720	0.9720	0.9720	0.9720	0.9720	0.9720	0.9720	0.9720
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	51	65	47	80	97	43	89	284	119	60	192	70
Total Analysis Volume [veh/h]	205	260	186	321	390	172	355	1135	474	240	766	282
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	115
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Overlap	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	3	8	0	7	4	4	5	2	0	1	6	0
Auxiliary Signal Groups						4,5						
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	6	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	30	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	1.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	26	35	0	23	32	32	25	44	0	13	32	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	7	0	7	0	0	7	0
Pedestrian Clearance [s]	0	24	0	0	21	21	0	21	0	0	21	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No	No	No	No		No	No	
Maximum Recall	No	No		No	No	No	No	No		No	No	
Pedestrian Recall	No	No		No	No	No	No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	R	L	C	C	L	C	R
C, Cycle Length [s]	115	115	115	115	115	115	115	115	115	115	115	115
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	10	18	18	19	27	47	15	53	53	9	47	47
g / C, Green / Cycle	0.08	0.15	0.15	0.17	0.24	0.40	0.13	0.46	0.46	0.08	0.41	0.41
(v / s)_i Volume / Saturation Flow Rate	0.06	0.13	0.12	0.19	0.11	0.10	0.11	0.45	0.45	0.08	0.21	0.16
s, saturation flow rate [veh/h]	3200	1800	1800	1700	3600	1800	3200	1800	1800	3200	3600	1800
c, Capacity [veh/h]	270	279	279	281	849	729	429	831	831	253	1463	732
d1, Uniform Delay [s]	51.54	47.36	46.49	48.02	37.68	22.53	48.52	30.14	30.14	52.78	25.74	24.03
k, delay calibration	0.11	0.11	0.11	0.25	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	4.37	7.29	4.00	83.14	0.39	0.16	4.11	24.32	24.32	16.82	1.34	1.53
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.76	0.85	0.75	1.14	0.46	0.24	0.83	0.97	0.97	0.95	0.52	0.39
d, Delay for Lane Group [s/veh]	55.92	54.65	50.49	131.16	38.07	22.70	52.62	54.45	54.45	69.59	27.09	25.57
Lane Group LOS	E	D	D	F	D	C	D	D	D	E	C	C
Critical Lane Group	No	Yes	No	Yes	No	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	3.05	7.17	6.00	14.51	4.76	3.10	5.19	26.41	26.41	4.04	8.09	5.68
50th-Percentile Queue Length [ft/ln]	76.34	179.26	149.92	362.87	118.88	77.58	129.86	660.21	660.21	100.89	202.20	142.08
95th-Percentile Queue Length [veh/ln]	5.50	11.56	10.01	22.09	8.33	5.59	8.93	34.84	34.84	7.26	12.75	9.59
95th-Percentile Queue Length [ft/ln]	137.41	289.04	250.32	552.36	208.28	139.65	223.30	870.91	870.91	181.60	318.80	239.82

Movement, Approach, & Intersection Results

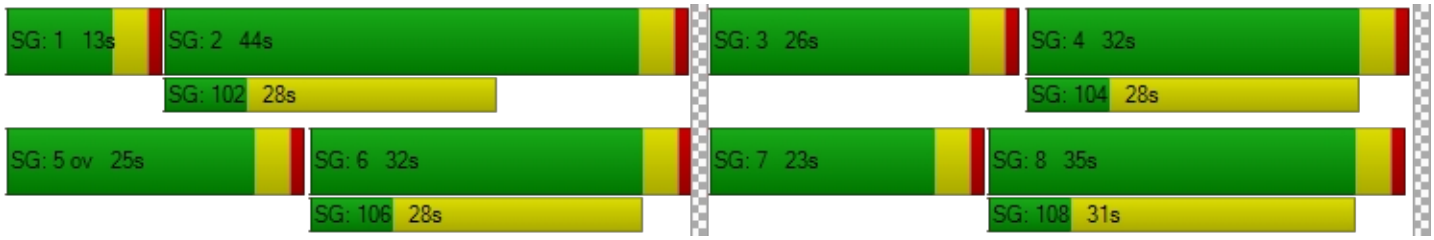
d_M, Delay for Movement [s/veh]	55.92	54.29	50.49	131.16	38.07	22.70	52.62	54.45	54.45	69.59	27.09	25.57
Movement LOS	E	D	D	F	D	C	D	D	D	E	C	C
d_A, Approach Delay [s/veh]	53.72			68.91			54.12			34.67		
Approach LOS	D			E			D			C		
d_I, Intersection Delay [s/veh]	51.56											
Intersection LOS	D											
Intersection V/C	0.979											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	47.05	47.05	47.05	47.05
l_p,int, Pedestrian LOS Score for Intersection	2.750	2.754	2.969	3.014
Crosswalk LOS	B	C	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	539	487	695	487
d_b, Bicycle Delay [s]	30.70	32.93	24.47	32.93
l_b,int, Bicycle LOS Score for Intersection	2.097	2.288	3.180	2.622
Bicycle LOS	B	B	C	B

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 6: Peyton Drive at Woodview Road

Control Type:	All-way stop	Delay (sec / veh):	9.4
Analysis Method:	HCM 7th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.262

Intersection Setup

Name	Peyton Drive			Peyton Drive			Woodview Road			Woodview Road		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	0	0	1	1	0	0	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			45.00			40.00			35.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			No			No		

Volumes

Name	Peyton Drive			Peyton Drive			Woodview Road			Woodview Road		
Base Volume Input [veh/h]	17	71	3	148	120	59	36	11	12	5	16	90
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	17	71	3	148	120	59	36	11	12	5	16	90
Peak Hour Factor	0.9500	0.9500	0.9500	0.9140	0.9500	0.9140	0.9140	0.9140	0.9500	0.9500	0.9140	0.9140
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	4	19	1	40	32	16	10	3	3	1	4	25
Total Analysis Volume [veh/h]	18	75	3	162	126	65	39	12	13	5	18	98
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	572	625	618	676	779	559	644	569	686
Degree of Utilization, x	0.03	0.12	0.26	0.19	0.08	0.07	0.04	0.01	0.17

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	0.10	0.43	1.05	0.68	0.27	0.22	0.12	0.03	0.61
95th-Percentile Queue Length [ft]	2.43	10.64	26.17	17.02	6.81	5.61	3.02	0.67	15.15
Approach Delay [s/veh]	9.27		9.58			9.20		9.02	
Approach LOS	A		A			A		A	
Intersection Delay [s/veh]	9.39								
Intersection LOS	A								

Intersection Level Of Service Report
Intersection 7: Pipeline Avenue at Woodview Road

Control Type:	Two-way stop	Delay (sec / veh):	22.6
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.179

Intersection Setup

Name	Pipeline Avenue		Pipeline Avenue		Woodview Road	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	40.00		30.00		35.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name	Pipeline Avenue		Pipeline Avenue		Woodview Road	
Base Volume Input [veh/h]	102	252	352	68	49	142
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	102	252	352	68	49	142
Peak Hour Factor	0.9620	0.9620	0.9620	0.9620	0.9620	0.9620
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	27	65	91	18	13	37
Total Analysis Volume [veh/h]	106	262	366	71	51	148
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.09	0.00	0.00	0.00	0.18	0.23
d_M, Delay for Movement [s/veh]	8.33	0.00	0.00	0.00	22.64	15.53
Movement LOS	A	A	A	A	C	C
95th-Percentile Queue Length [veh/ln]	0.19	0.19	0.00	0.00	1.96	1.96
95th-Percentile Queue Length [ft/ln]	4.69	4.69	0.00	0.00	48.95	48.95
d_A, Approach Delay [s/veh]	2.40		0.00		17.35	
Approach LOS	A		A		C	
d_I, Intersection Delay [s/veh]	4.32					
Intersection LOS	C					

Intersection Level Of Service Report
Intersection 8: Pipeline Avenue at Soquel Canyon Parkway

Control Type:	All-way stop	Delay (sec / veh):	16.5
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.717

Intersection Setup

Name	Pipeline Avenue		Soquel Canyon Parkway		Soquel Canyon Parkway	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	1	0	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	40.00		45.00		50.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		No	

Volumes

Name	Pipeline Avenue		Soquel Canyon Parkway		Soquel Canyon Parkway	
Base Volume Input [veh/h]	354	38	24	174	178	320
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	354	38	24	174	178	320
Peak Hour Factor	0.9350	0.9350	0.9350	0.9350	0.9350	0.9350
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	95	10	6	47	48	86
Total Analysis Volume [veh/h]	379	41	26	186	190	342
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	586	489	526	526	526	552	552	622
Degree of Utilization, x	0.72	0.05	0.12	0.12	0.12	0.17	0.17	0.55

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	5.91	0.17	0.40	0.40	0.40	0.62	0.62	3.35
95th-Percentile Queue Length [ft]	147.70	4.20	9.96	9.96	9.96	15.44	15.44	83.70
Approach Delay [s/veh]	23.15	10.46				13.64		
Approach LOS	C	B				B		
Intersection Delay [s/veh]	16.49							
Intersection LOS	C							

Intersection Level Of Service Report

Intersection 9: Soquel Canyon Parkway at Los Serranos Country Club Drive/Butterfield Ranch Road

Control Type:	Signalized	Delay (sec / veh):	33.9
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.494

Intersection Setup

Name	Soquel Canyon Parkway			Soquel Canyon Parkway			Lo Se			Butterfield Ranch Road		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	0	1	0	0	1	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Soquel Canyon Parkway			Soquel Canyon Parkway			Lo Se			Butterfield Ranch Road		
Base Volume Input [veh/h]	33	432	126	306	700	219	361	216	37	181	132	267
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	33	432	126	306	700	219	361	216	37	181	132	267
Peak Hour Factor	0.9020	0.9020	0.9020	0.9020	0.9020	0.9020	0.9020	0.9020	0.9020	0.9020	0.9020	0.9020
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	9	120	35	85	194	61	100	60	10	50	37	74
Total Analysis Volume [veh/h]	37	479	140	339	776	243	400	239	41	201	146	296
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Overlap
Signal Group	1	6	0	5	2	0	3	8	0	7	4	4
Auxiliary Signal Groups												4,5
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	6
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	30
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	3.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	1.0
Split [s]	27	39	0	19	31	0	23	39	0	23	39	39
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	3.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	7
Pedestrian Clearance [s]	0	28	0	0	18	0	0	28	0	0	28	28
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	2.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	2.0
Minimum Recall	No	No		No	No		No	No		No	No	No
Maximum Recall	No	No		No	No		No	No		No	No	No
Pedestrian Recall	No	No		No	No		No	No		No	No	No
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	C	L	C	C	L	C	R
C, Cycle Length [s]	120	120	120	120	120	120	120	120	120	120	120	120
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	0.00
g_i, Effective Green Time [s]	4	60	60	15	70	70	17	20	20	10	13	31
g / C, Green / Cycle	0.04	0.50	0.50	0.12	0.58	0.58	0.14	0.17	0.17	0.08	0.10	0.26
(v / s)_i Volume / Saturation Flow Rate	0.02	0.12	0.11	0.11	0.19	0.18	0.13	0.08	0.08	0.06	0.08	0.08
s, saturation flow rate [veh/h]	1700	3600	1800	3200	3600	1800	3200	1800	1800	3200	1800	3600
c, Capacity [veh/h]	62	1789	895	391	2099	1049	455	298	298	261	189	939
d1, Uniform Delay [s]	56.99	17.17	17.10	51.73	12.94	12.72	50.47	45.40	45.22	54.02	52.32	35.75
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	8.97	0.31	0.59	5.87	0.42	0.76	5.61	1.20	1.10	4.73	6.53	0.19
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.60	0.23	0.23	0.87	0.33	0.31	0.88	0.48	0.46	0.77	0.77	0.32
d, Delay for Lane Group [s/veh]	65.96	17.48	17.69	57.59	13.36	13.48	56.08	46.60	46.32	58.75	58.85	35.94
Lane Group LOS	E	B	B	E	B	B	E	D	D	E	E	D
Critical Lane Group	No	Yes	No	Yes	No	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	1.26	3.35	3.30	5.32	4.87	4.55	6.23	3.98	3.78	3.15	4.63	3.54
50th-Percentile Queue Length [ft/ln]	31.52	83.66	82.44	133.04	121.65	113.66	155.84	99.55	94.52	78.67	115.68	88.43
95th-Percentile Queue Length [veh/ln]	2.27	6.02	5.94	9.10	8.48	8.04	10.33	7.17	6.81	5.66	8.15	6.37
95th-Percentile Queue Length [ft/ln]	56.73	150.59	148.39	227.62	212.09	201.09	258.21	179.19	170.13	141.61	203.87	159.17

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	65.96	17.51	17.69	57.59	13.38	13.48	56.08	46.49	46.32	58.75	58.85	35.94
Movement LOS	E	B	B	E	B	B	E	D	D	E	E	D
d_A, Approach Delay [s/veh]	20.28			24.43			52.12			48.27		
Approach LOS	C			C			D			D		
d_I, Intersection Delay [s/veh]	33.85											
Intersection LOS	C											
Intersection V/C	0.494											

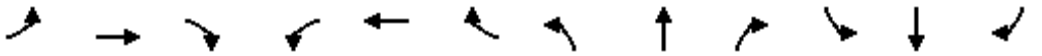
Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	49.52	49.52	49.52	49.52
l_p,int, Pedestrian LOS Score for Intersection	2.841	3.048	2.529	2.905
Crosswalk LOS	C	C	B	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	583	450	583	583
d_b, Bicycle Delay [s]	30.12	36.05	30.12	30.12
l_b,int, Bicycle LOS Score for Intersection	1.920	2.307	2.121	2.621
Bicycle LOS	A	B	B	B

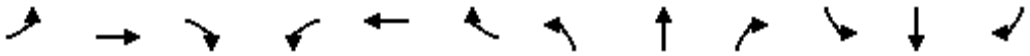
Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-





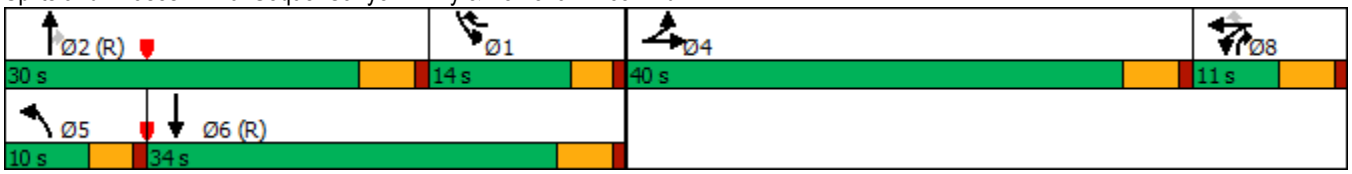
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	62	27	10	121	4	259	29	807	230	559	1057	62
Future Volume (vph)	62	27	10	121	4	259	29	807	230	559	1057	62
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	0.95	0.91	0.95	1.00	0.86	0.86	0.97	0.91	0.91
Frt		0.960			0.867	0.850		0.996	0.850		0.992	
Flt Protected	0.950			0.950	0.996		0.950			0.950		
Satd. Flow (prot)	1770	1788	0	1681	1464	1504	1770	4787	1362	3433	5045	0
Flt Permitted	0.950			0.950	0.996		0.950			0.950		
Satd. Flow (perm)	1770	1788	0	1681	1464	1504	1770	4787	1362	3433	5045	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		11			135	153		4	230		10	
Link Speed (mph)		25			25			50			50	
Link Distance (ft)		560			625			594			526	
Travel Time (s)		15.3			17.0			8.1			7.2	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	69	30	11	134	4	288	32	897	256	621	1174	69
Shared Lane Traffic (%)				10%		47%			10%			
Lane Group Flow (vph)	69	41	0	121	152	153	32	923	230	621	1243	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2	1	1	2	1	1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100		20	100	20	20	100	20	20	100	
Trailing Detector (ft)	0	0		0	0	0	0	0	0	0	0	
Detector 1 Position(ft)	0	0		0	0	0	0	0	0	0	0	
Detector 1 Size(ft)	20	6		20	6	20	20	6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Split	NA		Split	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	
Protected Phases	4	4		8	8	1	5	2	8	1	6	
Permitted Phases						8			2			
Detector Phase	4	4		8	8	1	5	2	8	1	6	
Switch Phase												
Minimum Initial (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	

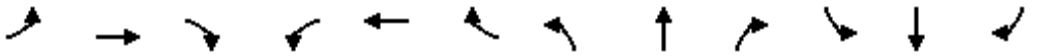


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Split (s)	40.0	40.0		11.0	11.0	10.0	10.0	30.0	11.0	10.0	23.0	
Total Split (s)	40.0	40.0		11.0	11.0	14.0	10.0	30.0	11.0	14.0	34.0	
Total Split (%)	42.1%	42.1%		11.6%	11.6%	14.7%	10.5%	31.6%	11.6%	14.7%	35.8%	
Maximum Green (s)	35.0	35.0		6.0	6.0	10.0	6.0	25.0	6.0	10.0	29.0	
Yellow Time (s)	4.0	4.0		4.0	4.0	3.0	3.0	4.0	4.0	3.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0	4.0	4.0	5.0	5.0	4.0	5.0	
Lead/Lag						Lag	Lead	Lead		Lag	Lag	
Lead-Lag Optimize?						Yes	Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	None		None	None	None	None	C-Max	None	None	C-Max	
Walk Time (s)	7.0	7.0						7.0			7.0	
Flash Dont Walk (s)	28.0	28.0						18.0			11.0	
Pedestrian Calls (#/hr)	5	5						5			5	
Act Effct Green (s)	13.6	13.6		13.9	13.9	25.7	6.7	40.7	59.6	10.0	48.1	
Actuated g/C Ratio	0.14	0.14		0.15	0.15	0.27	0.07	0.43	0.63	0.11	0.51	
v/c Ratio	0.27	0.15		0.49	0.46	0.30	0.26	0.45	0.24	1.72	0.49	
Control Delay	35.2	25.1		48.0	15.2	4.4	47.3	22.2	3.0	364.6	19.2	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	35.2	25.1		48.0	15.2	4.4	47.3	22.2	3.0	364.6	19.2	
LOS	D	C		D	B	A	D	C	A	F	B	
Approach Delay		31.4			20.6			19.1			134.3	
Approach LOS		C			C			B			F	
Queue Length 50th (ft)	40	17		69	9	0	19	146	0	~287	187	
Queue Length 95th (ft)	56	33		#207	#103	28	48	247	54	#394	305	
Internal Link Dist (ft)		480			545			514			446	
Turn Bay Length (ft)												
Base Capacity (vph)	652	665		245	329	518	124	2052	939	361	2557	
Starvation Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.11	0.06		0.49	0.46	0.30	0.26	0.45	0.24	1.72	0.49	

Intersection Summary			
Area Type:	Other		
Cycle Length: 95			
Actuated Cycle Length: 95			
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green			
Natural Cycle: 105			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.72			
Intersection Signal Delay: 79.5		Intersection LOS: E	
Intersection Capacity Utilization 57.7%		ICU Level of Service B	
Analysis Period (min) 15			
~ Volume exceeds capacity, queue is theoretically infinite.			
Queue shown is maximum after two cycles.			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 10: Soquel Canyon Pkwy & Pomona Rincon Rd





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	62	27	10	121	4	259	29	807	230	559	1057	62
Future Volume (veh/h)	62	27	10	121	4	259	29	807	230	559	1057	62
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	69	30	11	91	0	337	32	897	256	621	1174	69
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	106	78	29	113	0	1479	64	1477	517	1394	3162	186
Arrive On Green	0.06	0.06	0.06	0.06	0.00	0.06	0.04	0.26	0.26	0.40	0.64	0.64
Sat Flow, veh/h	1781	1306	479	1781	0	3170	1781	5611	1585	3456	4932	290
Grp Volume(v), veh/h	69	0	41	91	0	337	32	897	256	621	810	433
Grp Sat Flow(s),veh/h/ln	1781	0	1784	1781	0	1585	1781	1870	1585	1728	1702	1818
Q Serve(g_s), s	3.6	0.0	2.1	4.8	0.0	0.0	1.7	13.3	12.3	12.4	10.6	10.7
Cycle Q Clear(g_c), s	3.6	0.0	2.1	4.8	0.0	0.0	1.7	13.3	12.3	12.4	10.6	10.7
Prop In Lane	1.00		0.27	1.00		1.00	1.00		1.00	1.00		0.16
Lane Grp Cap(c), veh/h	106	0	107	113	0	1479	64	1477	517	1394	2182	1166
V/C Ratio(X)	0.65	0.00	0.38	0.81	0.00	0.23	0.50	0.61	0.49	0.45	0.37	0.37
Avail Cap(c_a), veh/h	656	0	657	113	0	1479	113	1477	517	1394	2182	1166
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	43.7	0.0	43.0	43.9	0.0	15.1	44.9	30.7	25.7	20.6	8.0	8.0
Incr Delay (d2), s/veh	6.5	0.0	2.3	34.0	0.0	0.1	5.9	1.9	3.4	0.2	0.5	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.8	0.0	1.0	3.2	0.0	2.2	0.8	5.8	5.3	4.6	3.2	3.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	50.2	0.0	45.3	77.9	0.0	15.2	50.8	32.6	29.1	20.8	8.5	8.9
LnGrp LOS	D	A	D	E	A	B	D	C	C	C	A	A
Approach Vol, veh/h		110			428			1185			1864	
Approach Delay, s/veh		48.3			28.5			32.3			12.7	
Approach LOS		D			C			C			B	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	43.3	30.0		10.7	7.4	65.9		11.0				
Change Period (Y+Rc), s	5.0	* 5		5.0	4.0	5.0		5.0				
Max Green Setting (Gmax), s	10.0	* 25		35.0	6.0	29.0		6.0				
Max Q Clear Time (g_c+I1), s	14.4	15.3		5.6	3.7	12.7		6.8				
Green Ext Time (p_c), s	0.0	4.4		0.4	0.0	6.8		0.0				

Intersection Summary			
HCM 6th Ctrl Delay		22.2	
HCM 6th LOS		C	

Notes

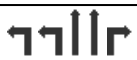
User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection Level Of Service Report
Intersection 11: Peyton Drive at Grand Avenue

Control Type:	Signalized	Delay (sec / veh):	35.9
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.570

Intersection Setup

Name	Peyton Drive			Peyton Drive			Grand Avenue			Grand Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	1	0	0	1	0	1	1	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Peyton Drive			Peyton Drive			Grand Avenue			Grand Avenue		
Base Volume Input [veh/h]	123	600	158	216	602	150	309	781	148	246	394	241
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	123	600	158	216	602	150	309	781	148	246	394	241
Peak Hour Factor	0.9730	0.9730	0.9730	0.9730	0.9730	0.9730	0.9730	0.9730	0.9730	0.9730	0.9730	0.9730
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	32	154	41	55	155	39	79	201	38	63	101	62
Total Analysis Volume [veh/h]	126	617	162	222	619	154	318	803	152	253	405	248
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	1	6	0	5	2	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	14	39	0	13	38	0	19	44	0	14	39	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	28	0	0	24	0	0	31	0	0	28	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	C	L	C	R	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	6	47	47	9	50	50	13	28	28	10	25	25
g / C, Green / Cycle	0.06	0.43	0.43	0.08	0.45	0.45	0.12	0.25	0.25	0.09	0.23	0.23
(v / s)_i Volume / Saturation Flow Rate	0.04	0.11	0.09	0.07	0.15	0.14	0.10	0.22	0.08	0.08	0.11	0.14
s, saturation flow rate [veh/h]	3200	5400	1800	3200	3600	1800	3200	3600	1800	3200	3600	1800
c, Capacity [veh/h]	183	2302	767	264	1625	813	379	916	458	293	820	410
d1, Uniform Delay [s]	50.93	20.46	19.92	49.80	19.38	19.24	47.52	39.39	33.42	49.33	37.00	38.08
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	4.52	0.29	0.63	7.09	0.52	0.98	5.05	2.87	0.42	7.50	0.46	1.44
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.69	0.27	0.21	0.84	0.32	0.31	0.84	0.88	0.33	0.86	0.49	0.61
d, Delay for Lane Group [s/veh]	55.44	20.75	20.54	56.89	19.91	20.22	52.57	42.26	33.85	56.83	37.46	39.53
Lane Group LOS	E	C	C	E	B	C	D	D	C	E	D	D
Critical Lane Group	Yes	No	No	No	Yes	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	1.82	3.46	2.74	3.26	4.36	4.25	4.52	10.66	3.36	3.72	4.78	6.13
50th-Percentile Queue Length [ft/ln]	45.42	86.47	68.46	81.57	108.93	106.22	112.91	266.39	83.99	93.12	119.57	153.17
95th-Percentile Queue Length [veh/ln]	3.27	6.23	4.93	5.87	7.78	7.63	8.00	16.01	6.05	6.70	8.37	10.19
95th-Percentile Queue Length [ft/ln]	81.75	155.64	123.23	146.82	194.51	190.73	200.04	400.23	151.18	167.62	209.23	254.66

Movement, Approach, & Intersection Results

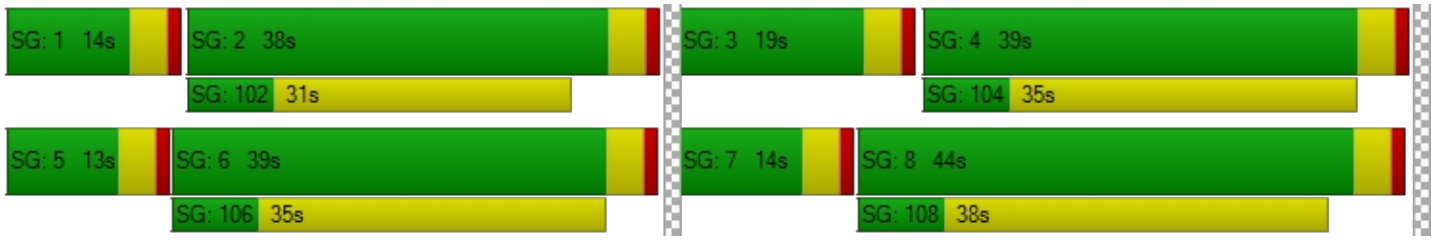
d_M, Delay for Movement [s/veh]	55.44	20.75	20.54	56.89	19.96	20.22	52.57	42.26	33.85	56.83	37.46	39.53
Movement LOS	E	C	C	E	B	C	D	D	C	E	D	D
d_A, Approach Delay [s/veh]	25.54			28.24			43.83			43.44		
Approach LOS	C			C			D			D		
d_I, Intersection Delay [s/veh]	35.88											
Intersection LOS	D											
Intersection V/C	0.570											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	44.58	44.58	44.58	44.58
l_p,int, Pedestrian LOS Score for Intersection	3.068	3.000	2.876	2.990
Crosswalk LOS	C	C	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	636	618	727	636
d_b, Bicycle Delay [s]	25.59	26.28	22.29	25.59
l_b,int, Bicycle LOS Score for Intersection	2.057	2.107	2.610	2.307
Bicycle LOS	B	B	B	B

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 12: Carbon Canyon Road at Fairway Drive/Ginseng Lane

Control Type:	Two-way stop	Delay (sec / veh):	185.3
Analysis Method:	HCM 7th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.695

Intersection Setup

Name	Carbon Canyon Road			Carbon Canyon Road			Fairway Drive			Ginseng Lane		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	0	0	0	1	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	45.00			45.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			No			No		

Volumes

Name	Carbon Canyon Road			Carbon Canyon Road			Fairway Drive			Ginseng Lane		
Base Volume Input [veh/h]	27	1334	4	8	480	36	31	0	25	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	27	1334	4	8	480	36	31	0	25	0	0	0
Peak Hour Factor	0.9750	0.9750	0.9750	0.9750	0.9750	0.9750	0.9750	0.9750	0.9750	0.9750	0.9750	0.9750
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	7	342	1	2	123	9	8	0	6	0	0	0
Total Analysis Volume [veh/h]	28	1368	4	8	492	37	32	0	26	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Free	Free	Stop	Stop
Flared Lane				No
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance			No	No
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.03	0.01	0.00	0.02	0.00	0.00	0.70	0.00	0.05	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	8.56	0.00	0.00	12.31	0.00	0.00	185.34	166.13	11.70	88.74	65.40	25.10
Movement LOS	A	A	A	B	A	A	F	F	B	F	F	D
95th-Percentile Queue Length [veh/ln]	0.08	0.00	0.00	0.05	0.00	0.00	2.70	2.70	0.14	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	2.08	0.00	0.00	1.22	0.00	0.00	67.40	67.40	3.62	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	0.17			0.18			107.50			59.74		
Approach LOS	A			A			F			F		
d_I, Intersection Delay [s/veh]	3.30											
Intersection LOS	F											

Intersection Level Of Service Report
Intersection 13: Carbon Canyon Road at Canyon Hills Road

Control Type:	Two-way stop	Delay (sec / veh):	65.2
Analysis Method:	HCM 7th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.318

Intersection Setup

Name	Carbon Canyon Road		Carbon Canyon Road		Canyon Hills Road	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	1	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	45.00		45.00		25.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name	Carbon Canyon Road		Carbon Canyon Road		Canyon Hills Road	
Base Volume Input [veh/h]	11	1351	415	36	24	20
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	11	1351	415	36	24	20
Peak Hour Factor	0.9650	0.9650	0.9650	0.9650	0.9650	0.9650
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	350	108	9	6	5
Total Analysis Volume [veh/h]	11	1400	430	37	25	21
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.01	0.00	0.00	0.32	0.03
d_M, Delay for Movement [s/veh]	8.32	0.00	0.00	0.00	65.19	25.24
Movement LOS	A	A	A	A	F	D
95th-Percentile Queue Length [veh/ln]	0.03	0.00	0.00	0.00	1.44	1.44
95th-Percentile Queue Length [ft/ln]	0.76	0.00	0.00	0.00	35.97	35.97
d_A, Approach Delay [s/veh]	0.06		0.00		46.95	
Approach LOS	A		A		E	
d_I, Intersection Delay [s/veh]	1.17					
Intersection LOS	F					

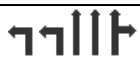
APPENDIX C-III

EXISTING WITH PROJECT WITH MITIGATION TRAFFIC CONDITIONS

Intersection Level Of Service Report
Intersection 2: Gateway Village/Boys Republic Drive at Grand Avenue

Control Type:	Signalized	Delay (sec / veh):	27.7
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.634

Intersection Setup

Name	Boys Republic Drive			Gateway Village			Grand Avenue			Grand Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	1	1	0	0	1	0	0	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			No		

Volumes

Name	Boys Republic Drive			Gateway Village			Grand Avenue			Grand Avenue		
Base Volume Input [veh/h]	54	26	455	79	31	31	49	566	16	491	828	73
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	54	26	455	79	31	31	49	566	16	491	828	73
Peak Hour Factor	0.8330	0.8330	0.8330	0.8330	0.8330	0.8330	0.8330	0.8330	0.8330	0.8330	0.8330	0.8330
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	16	8	137	24	9	9	15	170	5	147	248	22
Total Analysis Volume [veh/h]	65	31	546	95	37	37	59	679	19	589	994	88
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Split	Split	Overlap	Split	Split	Split	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	0	8	8	0	4	0	5	2	0	1	6	0
Auxiliary Signal Groups			1,8									
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	0	6	6	0	6	0	6	6	0	6	6	0
Maximum Green [s]	0	30	30	0	30	0	30	30	0	30	30	0
Amber [s]	0.0	3.0	3.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	1.0	1.0	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	10	10	0	35	0	10	25	0	40	55	0
Vehicle Extension [s]	0.0	3.0	3.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	0	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	24	0	0	14	0	0	11	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	2.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	2.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall		No	No		No		No	No		No	No	
Maximum Recall		No	No		No		No	No		No	No	
Pedestrian Recall		No	No		No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	R	L	C	L	C	C	L	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	15	44	8	8	5	46	46	25	66	66
g / C, Green / Cycle	0.14	0.40	0.07	0.07	0.05	0.42	0.42	0.22	0.60	0.60
(v / s)_i Volume / Saturation Flow Rate	0.06	0.30	0.05	0.05	0.03	0.13	0.13	0.18	0.19	0.20
s, saturation flow rate [veh/h]	1700	1800	1700	1700	1700	3600	1800	3200	3800	1800
c, Capacity [veh/h]	236	719	120	120	79	1515	758	717	2274	1077
d1, Uniform Delay [s]	43.27	28.52	50.04	49.99	51.85	21.16	21.28	40.63	10.95	11.11
k, delay calibration	0.11	0.41	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.12	6.08	7.42	7.00	13.00	0.52	1.09	2.43	0.37	0.85
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.41	0.76	0.71	0.70	0.75	0.30	0.31	0.82	0.32	0.34
d, Delay for Lane Group [s/veh]	44.39	34.60	57.45	56.99	64.85	21.67	22.37	43.05	11.31	11.96
Lane Group LOS	D	C	E	E	E	C	C	D	B	B
Critical Lane Group	No	Yes	Yes	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	2.46	13.35	2.54	2.48	1.89	4.00	4.30	7.77	4.27	4.51
50th-Percentile Queue Length [ft/ln]	61.47	333.81	63.52	62.05	47.29	100.12	107.54	194.13	106.79	112.67
95th-Percentile Queue Length [veh/ln]	4.43	19.34	4.57	4.47	3.40	7.21	7.70	12.34	7.66	7.99
95th-Percentile Queue Length [ft/ln]	110.64	483.62	114.33	111.70	85.12	180.22	192.57	308.38	191.53	199.71

Movement, Approach, & Intersection Results

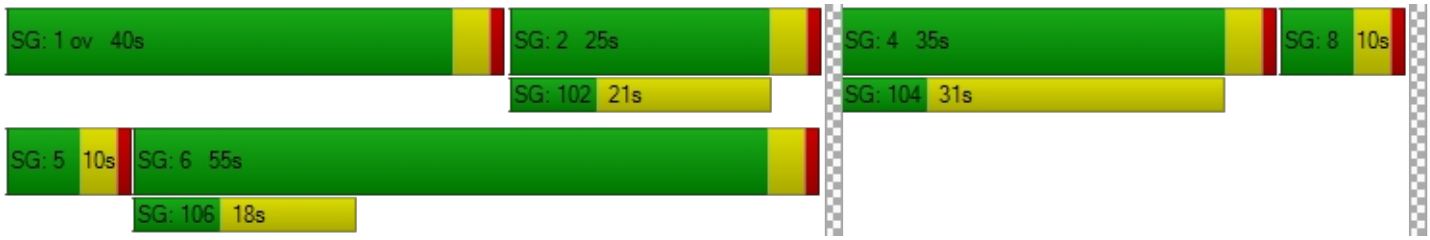
d_M, Delay for Movement [s/veh]	44.39	44.39	34.60	57.40	56.99	56.99	64.85	21.90	22.37	43.05	11.49	11.96
Movement LOS	D	D	C	E	E	E	E	C	C	D	B	B
d_A, Approach Delay [s/veh]	36.07			57.22			25.26			22.64		
Approach LOS	D			E			C			C		
d_I, Intersection Delay [s/veh]	27.72											
Intersection LOS	C											
Intersection V/C	0.634											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	0.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	44.58	44.58	44.58	0.00
l_p,int, Pedestrian LOS Score for Intersection	2.454	2.063	2.862	0.000
Crosswalk LOS	B	B	C	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	109	563	382	927
d_b, Bicycle Delay [s]	49.19	28.39	36.03	15.84
l_b,int, Bicycle LOS Score for Intersection	2.619	1.838	1.976	2.479
Bicycle LOS	B	A	A	B

Sequence

Ring 1	1	2	4	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 7: Pipeline Avenue at Woodview Road

Control Type:	Signalized	Delay (sec / veh):	23.4
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.600

Intersection Setup

Name	Pipeline Avenue		Pipeline Avenue		Woodview Road	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	40.00		30.00		35.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	No		No		No	
Crosswalk	Yes		No		Yes	

Volumes

Name	Pipeline Avenue		Pipeline Avenue		Woodview Road	
Base Volume Input [veh/h]	184	344	213	33	73	147
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00					
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	184	344	213	33	73	147
Peak Hour Factor	0.7200	0.7200	0.7200	0.7200	0.7200	0.7200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	64	119	74	11	25	51
Total Analysis Volume [veh/h]	256	478	296	46	101	204
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0		0		0	
v_di, Inbound Pedestrian Volume crossing m	0		0		0	
v_co, Outbound Pedestrian Volume crossing	0		0		0	
v_ci, Inbound Pedestrian Volume crossing mi	0		0		0	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Protected	Permissive	Permissive	Permissive	Permissive	Permissive
Signal Group	1	6	2	0	3	0
Auxiliary Signal Groups						
Lead / Lag	Lead	-	-	-	Lead	-
Minimum Green [s]	6	6	6	0	6	0
Maximum Green [s]	30	30	30	0	30	0
Amber [s]	3.0	3.0	3.0	0.0	3.0	0.0
All red [s]	1.0	1.0	1.0	0.0	1.0	0.0
Split [s]	25	43	18	0	47	0
Vehicle Extension [s]	3.0	3.0	3.0	0.0	3.0	0.0
Walk [s]	0	0	7	0	7	0
Pedestrian Clearance [s]	0	0	7	0	11	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No	No		No	
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	2.0	0.0	2.0	0.0
Minimum Recall	No	No	No		No	
Maximum Recall	No	No	No		No	
Pedestrian Recall	No	No	No		No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	C
C, Cycle Length [s]	90	90	90	90
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	16	64	44	18
g / C, Green / Cycle	0.17	0.71	0.49	0.20
(v / s)_i Volume / Saturation Flow Rate	0.15	0.27	0.19	0.18
s, saturation flow rate [veh/h]	1700	1800	1800	1700
c, Capacity [veh/h]	293	1271	881	349
d1, Uniform Delay [s]	36.30	5.30	14.50	34.67
k, delay calibration	0.11	0.50	0.50	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	8.00	0.85	1.29	6.94
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.87	0.38	0.39	0.87
d, Delay for Lane Group [s/veh]	44.30	6.15	15.80	41.61
Lane Group LOS	D	A	B	D
Critical Lane Group	Yes	No	Yes	Yes
50th-Percentile Queue Length [veh/ln]	5.88	2.91	4.49	6.91
50th-Percentile Queue Length [ft/ln]	147.11	72.73	112.19	172.65
95th-Percentile Queue Length [veh/ln]	9.86	5.24	7.96	11.22
95th-Percentile Queue Length [ft/ln]	246.56	130.92	199.05	280.40

Movement, Approach, & Intersection Results

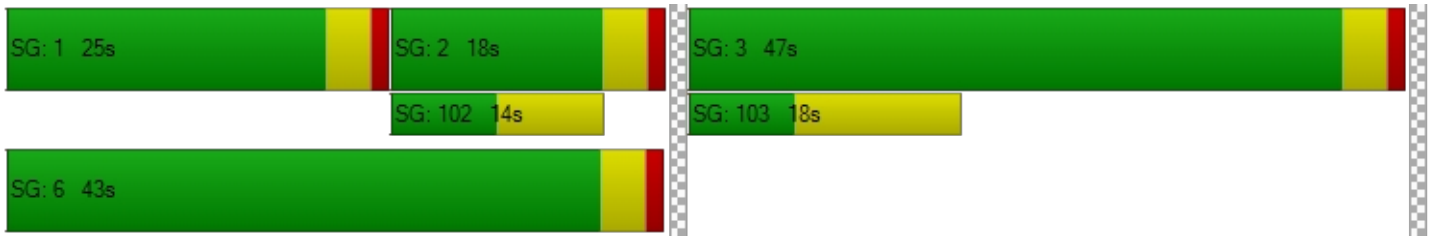
d_M, Delay for Movement [s/veh]	44.30	6.15	15.80	15.80	41.61	41.61
Movement LOS	D	A	B	B	D	D
d_A, Approach Delay [s/veh]	19.45		15.80		41.61	
Approach LOS	B		B		D	
d_I, Intersection Delay [s/veh]	23.44					
Intersection LOS	C					
Intersection V/C	0.600					

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	0.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	34.68	0.00	34.68
l_p,int, Pedestrian LOS Score for Intersection	2.474	0.000	2.060
Crosswalk LOS	B	F	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	866	311	955
d_b, Bicycle Delay [s]	14.46	32.10	12.28
l_b,int, Bicycle LOS Score for Intersection	2.771	2.124	2.063
Bicycle LOS	C	B	B

Sequence

Ring 1	1	2	3	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 2: Gateway Village/Boys Republic Drive at Grand Avenue

Control Type:	Signalized	Delay (sec / veh):	37.7
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.888

Intersection Setup

Name	Boys Republic Drive			Gateway Village			Grand Avenue			Grand Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	1	1	0	0	1	0	0	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			No		

Volumes

Name	Boys Republic Drive			Gateway Village			Grand Avenue			Grand Avenue		
Base Volume Input [veh/h]	35	30	650	246	48	65	103	1042	58	765	1062	119
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	35	30	650	246	48	65	103	1042	58	765	1062	119
Peak Hour Factor	0.9590	0.9590	0.9590	0.9590	0.9590	0.9590	0.9590	0.9590	0.9590	0.9590	0.9590	0.9590
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	9	8	169	64	13	17	27	272	15	199	277	31
Total Analysis Volume [veh/h]	36	31	678	257	50	68	107	1087	60	798	1107	124
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Split	Split	Overlap	Split	Split	Split	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	0	8	8	0	4	0	5	2	0	1	6	0
Auxiliary Signal Groups			1,8									
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	0	6	6	0	6	0	6	6	0	6	6	0
Maximum Green [s]	0	30	30	0	30	0	30	30	0	30	30	0
Amber [s]	0.0	3.0	3.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	1.0	1.0	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	10	10	0	35	0	13	25	0	50	62	0
Vehicle Extension [s]	0.0	3.0	3.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	7	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	10	10	0	24	0	0	14	0	0	10	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	2.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	2.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall		No	No		No		No	No		No	No	
Maximum Recall		No	No		No		No	No		No	No	
Pedestrian Recall		No	No		No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	R	L	C	L	C	C	L	C	C
C, Cycle Length [s]	120	120	120	120	120	120	120	120	120	120
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	19	58	16	16	9	34	34	35	60	60
g / C, Green / Cycle	0.16	0.48	0.13	0.13	0.08	0.28	0.28	0.29	0.50	0.50
(v / s)_i Volume / Saturation Flow Rate	0.04	0.38	0.11	0.11	0.06	0.21	0.22	0.25	0.23	0.23
s, saturation flow rate [veh/h]	1700	1800	1700	1700	1700	3600	1800	3200	3600	1800
c, Capacity [veh/h]	270	871	227	227	130	1017	509	934	1793	896
d1, Uniform Delay [s]	44.22	25.64	50.79	50.60	54.69	39.17	39.42	40.14	19.59	19.62
k, delay calibration	0.11	0.46	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.47	6.20	8.03	6.95	12.24	4.98	10.39	2.37	0.84	1.69
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.25	0.78	0.84	0.81	0.83	0.75	0.76	0.85	0.46	0.46
d, Delay for Lane Group [s/veh]	44.69	31.85	58.82	57.55	66.93	44.15	49.81	42.51	20.44	21.32
Lane Group LOS	D	C	E	E	E	D	D	D	C	C
Critical Lane Group	No	Yes	Yes	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	1.79	17.08	6.08	5.83	3.63	10.81	11.87	11.33	7.54	7.80
50th-Percentile Queue Length [ft/ln]	44.76	427.07	152.06	145.82	90.79	270.32	296.87	283.34	188.58	195.11
95th-Percentile Queue Length [veh/ln]	3.22	23.86	10.13	9.79	6.54	16.21	17.53	16.85	12.05	12.39
95th-Percentile Queue Length [ft/ln]	80.56	596.53	253.17	244.83	163.43	405.14	438.16	421.37	301.19	309.65

Movement, Approach, & Intersection Results

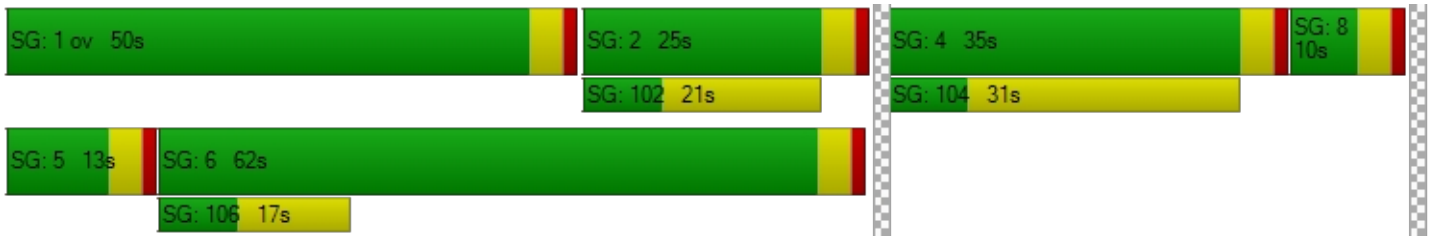
d_M, Delay for Movement [s/veh]	44.69	44.69	31.85	58.48	57.55	57.55	66.93	45.86	49.81	42.51	20.67	21.32
Movement LOS	D	D	C	E	E	E	E	D	D	D	C	C
d_A, Approach Delay [s/veh]	33.00			58.19			47.85			29.30		
Approach LOS	C			E			D			C		
d_I, Intersection Delay [s/veh]	37.67											
Intersection LOS	D											
Intersection V/C	0.888											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	0.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	49.54	49.54	49.54	0.00
l_p,int, Pedestrian LOS Score for Intersection	2.548	2.161	2.951	0.000
Crosswalk LOS	B	B	C	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	100	516	350	966
d_b, Bicycle Delay [s]	54.18	33.03	40.87	16.04
l_b,int, Bicycle LOS Score for Intersection	2.789	2.178	2.249	2.676
Bicycle LOS	C	B	B	B

Sequence

Ring 1	1	2	4	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 7: Pipeline Avenue at Woodview Road

Control Type:	Signalized	Delay (sec / veh):	18.6
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.487

Intersection Setup

Name	Pipeline Avenue		Pipeline Avenue		Woodview Road	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	40.00		30.00		35.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	No		No		No	
Crosswalk	Yes		No		Yes	

Volumes

Name	Pipeline Avenue		Pipeline Avenue		Woodview Road	
Base Volume Input [veh/h]	102	252	352	68	49	142
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00					
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	102	252	352	68	49	142
Peak Hour Factor	0.9620	0.9620	0.9620	0.9620	0.9620	0.9620
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	27	65	91	18	13	37
Total Analysis Volume [veh/h]	106	262	366	71	51	148
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0		0		0	
v_di, Inbound Pedestrian Volume crossing m	0		0		0	
v_co, Outbound Pedestrian Volume crossing	0		0		0	
v_ci, Inbound Pedestrian Volume crossing mi	0		0		0	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Protected	Permissive	Permissive	Permissive	Permissive	Permissive
Signal Group	1	6	2	0	3	0
Auxiliary Signal Groups						
Lead / Lag	Lead	-	-	-	Lead	-
Minimum Green [s]	6	6	6	0	6	0
Maximum Green [s]	30	30	30	0	30	0
Amber [s]	3.0	3.0	3.0	0.0	3.0	0.0
All red [s]	1.0	1.0	1.0	0.0	1.0	0.0
Split [s]	21	39	18	0	51	0
Vehicle Extension [s]	3.0	3.0	3.0	0.0	3.0	0.0
Walk [s]	0	0	7	0	7	0
Pedestrian Clearance [s]	0	0	7	0	11	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No	No		No	
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	2.0	0.0	2.0	0.0
Minimum Recall	No	No	No		No	
Maximum Recall	No	No	No		No	
Pedestrian Recall	No	No	No		No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	C
C, Cycle Length [s]	90	90	90	90
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	7	69	58	13
g / C, Green / Cycle	0.08	0.77	0.65	0.14
(v / s)_i Volume / Saturation Flow Rate	0.06	0.15	0.24	0.12
s, saturation flow rate [veh/h]	1700	1800	1800	1700
c, Capacity [veh/h]	135	1386	1163	240
d1, Uniform Delay [s]	40.67	2.79	7.46	37.60
k, delay calibration	0.11	0.50	0.50	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	9.45	0.30	0.93	7.17
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.78	0.19	0.38	0.83
d, Delay for Lane Group [s/veh]	50.13	3.09	8.39	44.77
Lane Group LOS	D	A	A	D
Critical Lane Group	Yes	No	Yes	Yes
50th-Percentile Queue Length [veh/ln]	2.58	0.86	3.74	4.62
50th-Percentile Queue Length [ft/ln]	64.53	21.39	93.44	115.45
95th-Percentile Queue Length [veh/ln]	4.65	1.54	6.73	8.14
95th-Percentile Queue Length [ft/ln]	116.15	38.51	168.20	203.56

Movement, Approach, & Intersection Results

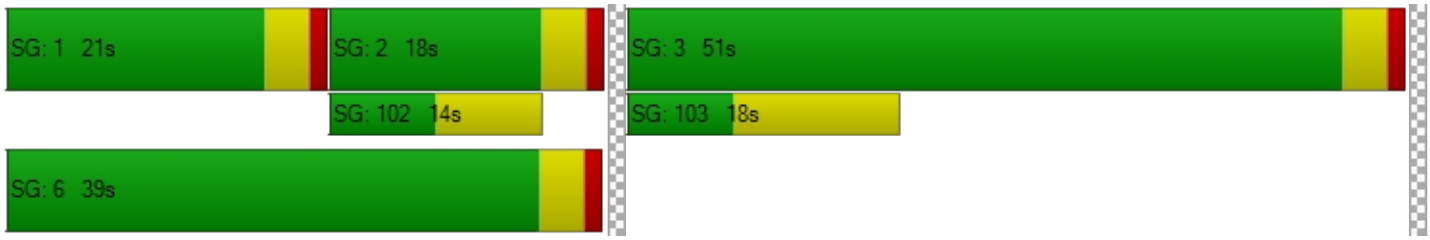
d_M, Delay for Movement [s/veh]	50.13	3.09	8.39	8.39	44.77	44.77
Movement LOS	D	A	A	A	D	D
d_A, Approach Delay [s/veh]	16.64		8.39		44.77	
Approach LOS	B		A		D	
d_I, Intersection Delay [s/veh]	18.62					
Intersection LOS	B					
Intersection V/C	0.487					

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	0.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	34.68	0.00	34.68
l_p,int, Pedestrian LOS Score for Intersection	2.322	0.000	1.928
Crosswalk LOS	B	F	A
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	778	311	1044
d_b, Bicycle Delay [s]	16.82	32.10	10.28
l_b,int, Bicycle LOS Score for Intersection	2.167	2.281	1.888
Bicycle LOS	B	B	A

Sequence

Ring 1	1	2	3	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



APPENDIX D

YEAR 2040 MODELING WORKSHEETS

1. Peyton Drive at Chino Avenue

AM PEAK HOUR

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** INPUT DATA *** Modified by: COMSIS Corp. (M. Roskin) 4/9/86
Modified by: FHWA 12/21/87

APPROACH	TURN MOVEMENT	BY COUNT	APPROACH	FY TOTAL
NORTH BOUND	LEFT	160	NORTHBOUND	
	THRU	478	IN ...	755
	RIGHT	121	OUT ...	657
SOUTH BOUND	LEFT	147	SOUTHBOUND	
	THRU	399	IN ...	803
	RIGHT	201	OUT ...	808
EAST BOUND	LEFT	225	EASTBOUND	
	THRU	324	IN ...	689
	RIGHT	122	OUT ...	731
WEST BOUND	LEFT	109	WESTBOUND	
	THRU	316	IN ...	604
	RIGHT	117	OUT ...	656

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** RESULTS *** Modified by: COMSIS Corp. (M. Roskin) 2/13/86

APPROACH	TURN MOVEMENT	BY COUNT	FY FORECAST
NORTH BOUND	LEFT	160	192
	THRU	478	588
	RIGHT	121	143
SOUTH BOUND	LEFT	147	171
	THRU	399	487
	RIGHT	201	239
EAST BOUND	LEFT	225	268
	THRU	324	383
	RIGHT	122	150
WEST BOUND	LEFT	109	128
	THRU	316	356
	RIGHT	117	142

2. Gateway Village/Boys Republic Drive at Grand Avenue

AM PEAK HOUR

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** INPUT DATA *** Modified by: COMSIS Corp. (M. Roskin) 4/9/86
Modified by: FHWA 12/21/87

APPROACH	TURN MOVEMENT	BY COUNT	APPROACH	FY TOTAL
NORTH BOUND	LEFT	11	NORTHBOUND	
	THRU	26	IN ...	244
	RIGHT	254	OUT ...	303
SOUTH BOUND	LEFT	79	SOUTHBOUND	
	THRU	31	IN ...	141
	RIGHT	31	OUT ...	148
EAST BOUND	LEFT	49	EASTBOUND	
	THRU	553	IN ...	843
	RIGHT	4	OUT ...	1335
WEST BOUND	LEFT	431	WESTBOUND	
	THRU	825	IN ...	1648
	RIGHT	73	OUT ...	1089

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** RESULTS *** Modified by: COMSIS Corp. (M. Roskin) 2/13/86

APPROACH	TURN MOVEMENT	BY COUNT	FY FORECAST
NORTH BOUND	LEFT	11	13
	THRU	26	30
	RIGHT	254	298
SOUTH BOUND	LEFT	79	92
	THRU	31	37
	RIGHT	31	39
EAST BOUND	LEFT	49	55
	THRU	553	788
	RIGHT	4	4
WEST BOUND	LEFT	431	507
	THRU	825	1,285
	RIGHT	73	86

3. Peyton Drive at Eucalyptus Avenue

AM PEAK HOUR

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** INPUT DATA *** Modified by: COMSIS Corp. (M. Roskin) 4/9/86
Modified by: FHWA 12/21/87

APPROACH	TURN MOVEMENT	BY COUNT	APPROACH	FY TOTAL
NORTH BOUND	LEFT	10	NORTHBOUND	
	THRU	552	IN ...	742
	RIGHT	105	OUT ...	717
SOUTH BOUND	LEFT	175	SOUTHBOUND	
	THRU	460	IN ...	914
	RIGHT	224	OUT ...	1,111
EAST BOUND	LEFT	247	EASTBOUND	
	THRU	114	IN ...	370
	RIGHT	10	OUT ...	435
WEST BOUND	LEFT	124	WESTBOUND	
	THRU	107	IN ...	636
	RIGHT	255	OUT ...	398

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** RESULTS *** Modified by: COMSIS Corp. (M. Roskin) 2/13/86

APPROACH	TURN MOVEMENT	BY COUNT	FY FORECAST
NORTH BOUND	LEFT	10	20
	THRU	552	680
	RIGHT	105	126
SOUTH BOUND	LEFT	175	206
	THRU	460	567
	RIGHT	224	269
EAST BOUND	LEFT	247	296
	THRU	114	134
	RIGHT	10	14
WEST BOUND	LEFT	124	192
	THRU	107	167
	RIGHT	255	300

4. Rustic Drive/Carbon Canyon Road at Chino Hills Parkway

AM PEAK HOUR

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** INPUT DATA *** Modified by: COMSIS Corp. (M. Roskin) 4/9/86
Modified by: FHWA 12/21/87

APPROACH	TURN MOVEMENT	BY COUNT	APPROACH	FY TOTAL
NORTH BOUND	LEFT	186	NORTHBOUND	
	THRU	0	IN ...	743
	RIGHT	278	OUT ...	2,006
SOUTH BOUND	LEFT	3	SOUTHBOUND	
	THRU	0	IN ...	31
	RIGHT	0	OUT ...	26
EAST BOUND	LEFT	14	EASTBOUND	
	THRU	278	IN ...	493
	RIGHT	270	OUT ...	591
WEST BOUND	LEFT	1007	WESTBOUND	
	THRU	612	IN ...	2,273
	RIGHT	3	OUT ...	916

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** RESULTS *** Modified by: COMSIS Corp. (M. Roskin) 2/13/86

APPROACH	TURN MOVEMENT	BY COUNT	FY FORECAST
NORTH BOUND	LEFT	186	233
	THRU	0	1
	RIGHT	278	613
SOUTH BOUND	LEFT	3	31
	THRU	0	1
	RIGHT	0	1
EAST BOUND	LEFT	14	17
	THRU	278	380
	RIGHT	270	322
WEST BOUND	LEFT	1,007	1,800
	THRU	612	771
	RIGHT	3	9

5. Peyton Drive at Chino Hills Parkway

AM PEAK HOUR

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** INPUT DATA *** Modified by: COMSIS Corp. (M. Roskin) 4/9/86
Modified by: FHWA 12/21/87

APPROACH	TURN MOVEMENT	BY COUNT	APPROACH	FY TOTAL
NORTH BOUND	LEFT	423	NORTHBOUND	
	THRU	347	IN ...	1,078
	RIGHT	261	OUT ...	468
SOUTH BOUND	LEFT	144	SOUTHBOUND	
	THRU	188	IN ...	707
	RIGHT	246	OUT ...	753
EAST BOUND	LEFT	129	EASTBOUND	
	THRU	359	IN ...	944
	RIGHT	95	OUT ...	2,184
WEST BOUND	LEFT	179	WESTBOUND	
	THRU	874	IN ...	1,754
	RIGHT	215	OUT ...	1,078

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** RESULTS *** Modified by: COMSIS Corp. (M. Roskin) 2/13/86

APPROACH	TURN MOVEMENT	BY COUNT	FY FORECAST
NORTH BOUND	LEFT	423	499
	THRU	347	413
	RIGHT	261	307
SOUTH BOUND	LEFT	144	196
	THRU	188	225
	RIGHT	246	353
EAST BOUND	LEFT	129	195
	THRU	359	628
	RIGHT	95	121
WEST BOUND	LEFT	179	210
	THRU	874	1,332
	RIGHT	215	286

6. Peyton Drive at Woodview Road

AM PEAK HOUR

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** INPUT DATA *** Modified by: COMSIS Corp. (M. Roskin) 4/9/86
Modified by: FHWA 12/21/87

APPROACH	TURN MOVEMENT	BY COUNT	APPROACH	FY TOTAL
NORTH BOUND	LEFT	0	NORTHBOUND	
	THRU	0	IN ...	0
	RIGHT	0	OUT ...	0
SOUTH BOUND	LEFT	182	SOUTHBOUND	
	THRU	0	IN ...	250
	RIGHT	42	OUT ...	370
EAST BOUND	LEFT	57	EASTBOUND	
	THRU	24	IN ...	78
	RIGHT	0	OUT ...	144
WEST BOUND	LEFT	0	WESTBOUND	
	THRU	21	IN ...	389
	RIGHT	268	OUT ...	203

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** RESULTS *** Modified by: COMSIS Corp. (M. Roskin) 2/13/86

APPROACH	TURN MOVEMENT	BY COUNT	FY FORECAST
NORTH BOUND	LEFT	0	0
	THRU	0	0
	RIGHT	0	0
SOUTH BOUND	LEFT	182	236
	THRU	0	0
	RIGHT	42	77
EAST BOUND	LEFT	57	69
	THRU	24	69
	RIGHT	0	0
WEST BOUND	LEFT	0	0
	THRU	21	67
	RIGHT	268	348

7. Pipeline Avenue at Woodview Road

AM PEAK HOUR

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** INPUT DATA *** Modified by: COMSIS Corp. (M. Roskin) 4/9/86
Modified by: FHWA 12/21/87

APPROACH	TURN MOVEMENT	BY COUNT	APPROACH	FY TOTAL
NORTH BOUND	LEFT	275	NORTHBOUND	
	THRU	251	IN ...	571
	RIGHT	0	OUT ...	379
SOUTH BOUND	LEFT	0	SOUTHBOUND	
	THRU	184	IN ...	242
	RIGHT	15	OUT ...	257
EAST BOUND	LEFT	15	EASTBOUND	
	THRU	0	IN ...	213
	RIGHT	201	OUT ...	388
WEST BOUND	LEFT	0	WESTBOUND	
	THRU	0	IN ...	0
	RIGHT	0	OUT ...	0

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** RESULTS *** Modified by: COMSIS Corp. (M. Roskin) 2/13/86

APPROACH	TURN MOVEMENT	BY COUNT	FY FORECAST
NORTH BOUND	LEFT	275	349
	THRU	251	326
	RIGHT	0	0
SOUTH BOUND	LEFT	0	0
	THRU	184	264
	RIGHT	15	39
EAST BOUND	LEFT	15	61
	THRU	0	0
	RIGHT	201	316
WEST BOUND	LEFT	0	0
	THRU	0	0
	RIGHT	0	0

8. Pipeline Avenue at Soquel Canyon Parkway

AM PEAK HOUR

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** INPUT DATA *** Modified by: COMSIS Corp. (M. Roskin) 4/9/86
Modified by: FHWA 12/21/87

APPROACH	TURN MOVEMENT	BY COUNT	APPROACH	FY TOTAL
NORTH BOUND	LEFT	0	NORTHBOUND	
	THRU	0	IN ...	0
	RIGHT	0	OUT ...	0
SOUTH BOUND	LEFT	367	SOUTHBOUND	
	THRU	0	IN ...	376
	RIGHT	18	OUT ...	518
EAST BOUND	LEFT	26	EASTBOUND	
	THRU	38	IN ...	64
	RIGHT	0	OUT ...	42
WEST BOUND	LEFT	0	WESTBOUND	
	THRU	24	IN ...	516
	RIGHT	465	OUT ...	396

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** RESULTS *** Modified by: COMSIS Corp. (M. Roskin) 2/13/86

APPROACH	TURN MOVEMENT	BY COUNT	FY FORECAST
NORTH BOUND	LEFT	0	0
	THRU	0	0
	RIGHT	0	0
SOUTH BOUND	LEFT	367	562
	THRU	0	0
	RIGHT	18	22
EAST BOUND	LEFT	26	32
	THRU	38	54
	RIGHT	0	0
WEST BOUND	LEFT	0	0
	THRU	24	33
	RIGHT	465	605

9. Soquel Canyon Parkway at Los Serranos Country Club Drive/Butterfield Ranch Road

AM PEAK HOUR

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** INPUT DATA *** Modified by: COMSIS Corp. (M. Roskin) 4/9/86
Modified by: FHWA 12/21/87

APPROACH	TURN MOVEMENT	BY COUNT	APPROACH	FY TOTAL
NORTH BOUND	LEFT	12	NORTHBOUND	
	THRU	542	IN ...	637
	RIGHT	92	OUT ...	541
SOUTH BOUND	LEFT	88	SOUTHBOUND	
	THRU	262	IN ...	596
	RIGHT	223	OUT ...	1478
EAST BOUND	LEFT	295	EASTBOUND	
	THRU	111	IN ...	466
	RIGHT	17	OUT ...	478
WEST BOUND	LEFT	235	WESTBOUND	
	THRU	208	IN ...	1148
	RIGHT	428	OUT ...	351

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** RESULTS *** Modified by: COMSIS Corp. (M. Roskin) 2/13/86

APPROACH	TURN MOVEMENT	BY COUNT	FY FORECAST
NORTH BOUND	LEFT	12	14
	THRU	542	734
	RIGHT	92	130
SOUTH BOUND	LEFT	88	120
	THRU	262	341
	RIGHT	223	266
EAST BOUND	LEFT	295	351
	THRU	111	158
	RIGHT	17	21
WEST BOUND	LEFT	235	291
	THRU	208	267
	RIGHT	428	630

10. Soquel Canyon Parkway at Pomona Rincon Road

AM PEAK HOUR

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** INPUT DATA *** Modified by: COMSIS Corp. (M. Roskin) 4/9/86
Modified by: FHWA 12/21/87

APPROACH	TURN MOVEMENT	BY COUNT	APPROACH	FY TOTAL
NORTH BOUND	LEFT	29	NORTHBOUND	
	THRU	998	IN ...	1553
	RIGHT	313	OUT ...	594
SOUTH BOUND	LEFT	420	SOUTHBOUND	
	THRU	443	IN ...	940
	RIGHT	53	OUT ...	1626
EAST BOUND	LEFT	29	EASTBOUND	
	THRU	79	IN ...	114
	RIGHT	6	OUT ...	85
WEST BOUND	LEFT	122	WESTBOUND	
	THRU	3	IN ...	511
	RIGHT	386	OUT ...	812

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** RESULTS *** Modified by: COMSIS Corp. (M. Roskin) 2/13/86

APPROACH	TURN MOVEMENT	BY COUNT	FY FORECAST
NORTH BOUND	LEFT	29	34
	THRU	998	1,292
	RIGHT	313	400
SOUTH BOUND	LEFT	420	677
	THRU	443	573
	RIGHT	53	62
EAST BOUND	LEFT	29	32
	THRU	79	92
	RIGHT	6	7
WEST BOUND	LEFT	122	160
	THRU	3	3
	RIGHT	386	518

11. Peyton Drive at Grand Avenue

AM PEAK HOUR

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** INPUT DATA *** Modified by: COMSIS Corp. (M. Roskin) 4/9/86
Modified by: FHWA 12/21/87

APPROACH	TURN MOVEMENT	BY COUNT	APPROACH	FY TOTAL
NORTH BOUND	LEFT	204	NORTHBOUND	
	THRU	553	IN ...	927
	RIGHT	116	OUT ...	1,135
SOUTH BOUND	LEFT	117	SOUTHBOUND	
	THRU	655	IN ...	1,038
	RIGHT	230	OUT ...	843
EAST BOUND	LEFT	199	EASTBOUND	
	THRU	441	IN ...	1,098
	RIGHT	241	OUT ...	1,555
WEST BOUND	LEFT	188	WESTBOUND	
	THRU	651	IN ...	1,380
	RIGHT	73	OUT ...	911

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** RESULTS *** Modified by: COMSIS Corp. (M. Roskin) 2/13/86

APPROACH	TURN MOVEMENT	BY COUNT	FY FORECAST
NORTH BOUND	LEFT	204	245
	THRU	553	674
	RIGHT	116	147
SOUTH BOUND	LEFT	117	144
	THRU	655	788
	RIGHT	230	269
EAST BOUND	LEFT	199	235
	THRU	441	620
	RIGHT	241	285
WEST BOUND	LEFT	188	246
	THRU	651	1,041
	RIGHT	73	94

12. Carbon Canyon Road at Fairway Drive/Ginseng Lane

AM PEAK HOUR

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** INPUT DATA *** Modified by: COMSIS Corp. (M. Roskin) 4/9/86
Modified by: FHWA 12/21/87

APPROACH	TURN MOVEMENT	BY COUNT	APPROACH	FY TOTAL
NORTH BOUND	LEFT	14	NORTHBOUND	
	THRU	347	IN ...	640
	RIGHT	0	OUT ...	1,947
SOUTH BOUND	LEFT	1	SOUTHBOUND	
	THRU	1214	IN ...	1,959
	RIGHT	15	OUT ...	630
EAST BOUND	LEFT	4	EASTBOUND	
	THRU	0	IN ...	8
	RIGHT	4	OUT ...	29
WEST BOUND	LEFT	0	WESTBOUND	
	THRU	0	IN ...	0
	RIGHT	0	OUT ...	1

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** RESULTS *** Modified by: COMSIS Corp. (M. Roskin) 2/13/86

APPROACH	TURN MOVEMENT	BY COUNT	FY FORECAST
NORTH BOUND	LEFT	14	17
	THRU	347	626
	RIGHT	0	0
SOUTH BOUND	LEFT	1	1
	THRU	1,214	1,943
	RIGHT	15	18
EAST BOUND	LEFT	4	4
	THRU	0	0
	RIGHT	4	4
WEST BOUND	LEFT	0	0
	THRU	0	0
	RIGHT	0	0

13. Carbon Canyon Road at Canyon Hills Road

AM PEAK HOUR

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** INPUT DATA *** Modified by: COMSIS Corp. (M. Roskin) 4/9/86
Modified by: FHWA 12/21/87

APPROACH	TURN MOVEMENT	BY COUNT	APPROACH	FY TOTAL
NORTH BOUND	LEFT	11	NORTHBOUND	
	THRU	254	IN ...	544
	RIGHT	0	OUT ...	1,947
SOUTH BOUND	LEFT	0	SOUTHBOUND	
	THRU	1187	IN ...	1,938
	RIGHT	22	OUT ...	567
EAST BOUND	LEFT	34	EASTBOUND	
	THRU	0	IN ...	65
	RIGHT	31	OUT ...	33
WEST BOUND	LEFT	0	WESTBOUND	
	THRU	0	IN ...	0
	RIGHT	0	OUT ...	0

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** RESULTS *** Modified by: COMSIS Corp. (M. Roskin) 2/13/86

APPROACH	TURN MOVEMENT	BY COUNT	FY FORECAST
NORTH BOUND	LEFT	11	17
	THRU	254	532
	RIGHT	0	5
SOUTH BOUND	LEFT	0	6
	THRU	1,187	1,917
	RIGHT	22	32
EAST BOUND	LEFT	34	55
	THRU	0	0
	RIGHT	31	49
WEST BOUND	LEFT	0	13
	THRU	0	0
	RIGHT	0	16

1. Peyton Drive at Chino Avenue

PM PEAK HOUR

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** INPUT DATA *** Modified by: COMSIS Corp. (M. Roskin) 4/9/86
Modified by: FHWA 12/21/87

APPROACH	TURN MOVEMENT	BY COUNT	APPROACH	FY TOTAL
NORTH BOUND	LEFT	114	NORTHBOUND	
	THRU	622	IN ...	909
	RIGHT	180	OUT ...	1095
SOUTH BOUND	LEFT	324	SOUTHBOUND	
	THRU	801	IN ...	1334
	RIGHT	148	OUT ...	916
EAST BOUND	LEFT	91	EASTBOUND	
	THRU	177	IN ...	617
	RIGHT	120	OUT ...	441
WEST BOUND	LEFT	136	WESTBOUND	
	THRU	139	IN ...	587
	RIGHT	268	OUT ...	993

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** RESULTS *** Modified by: COMSIS Corp. (M. Roskin) 2/13/86

APPROACH	TURN MOVEMENT	BY COUNT	FY FORECAST
NORTH BOUND	LEFT	114	140
	THRU	622	763
	RIGHT	180	244
SOUTH BOUND	LEFT	324	414
	THRU	801	979
	RIGHT	148	176
EAST BOUND	LEFT	91	111
	THRU	177	335
	RIGHT	120	171
WEST BOUND	LEFT	136	156
	THRU	139	168
	RIGHT	268	327

2. Gateway Village/Boys Republic Drive at Grand Avenue

PM PEAK HOUR

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** INPUT DATA *** Modified by: COMSIS Corp. (M. Roskin) 4/9/86
Modified by: FHWA 12/21/87

APPROACH	TURN MOVEMENT	BY COUNT	APPROACH	FY TOTAL
NORTH BOUND	LEFT	12	NORTHBOUND	
	THRU	30	IN ...	427
	RIGHT	542	OUT ...	554
SOUTH BOUND	LEFT	246	SOUTHBOUND	
	THRU	48	IN ...	359
	RIGHT	65	OUT ...	252
EAST BOUND	LEFT	103	EASTBOUND	
	THRU	1036	IN ...	1590
	RIGHT	22	OUT ...	1423
WEST BOUND	LEFT	597	WESTBOUND	
	THRU	1051	IN ...	1981
	RIGHT	119	OUT ...	2128

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** RESULTS *** Modified by: COMSIS Corp. (M. Roskin) 2/13/86

APPROACH	TURN MOVEMENT	BY COUNT	FY FORECAST
NORTH BOUND	LEFT	12	14
	THRU	30	36
	RIGHT	542	637
SOUTH BOUND	LEFT	246	290
	THRU	48	57
	RIGHT	65	77
EAST BOUND	LEFT	103	121
	THRU	1,036	1,465
	RIGHT	22	26
WEST BOUND	LEFT	597	702
	THRU	1,051	1,347
	RIGHT	119	140

3. Peyton Drive at Eucalyptus Avenue

PM PEAK HOUR

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** INPUT DATA *** Modified by: COMSIS Corp. (M. Roskin) 4/9/86
Modified by: FHWA 12/21/87

APPROACH	TURN MOVEMENT	BY COUNT	APPROACH	FY TOTAL
NORTH BOUND	LEFT	20	NORTHBOUND	
	THRU	413	IN ...	640
	RIGHT	168	OUT ...	802
SOUTH BOUND	LEFT	204	SOUTHBOUND	
	THRU	556	IN ...	1,101
	RIGHT	290	OUT ...	848
EAST BOUND	LEFT	190	EASTBOUND	
	THRU	250	IN ...	674
	RIGHT	17	OUT ...	682
WEST BOUND	LEFT	160	WESTBOUND	
	THRU	239	IN ...	731
	RIGHT	196	OUT ...	814

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** RESULTS *** Modified by: COMSIS Corp. (M. Roskin) 2/13/86

APPROACH	TURN MOVEMENT	BY COUNT	FY FORECAST
NORTH BOUND	LEFT	20	39
	THRU	413	520
	RIGHT	168	206
SOUTH BOUND	LEFT	204	239
	THRU	556	693
	RIGHT	290	344
EAST BOUND	LEFT	190	245
	THRU	250	401
	RIGHT	17	28
WEST BOUND	LEFT	160	203
	THRU	239	331
	RIGHT	196	231

4. Rustic Drive/Carbon Canyon Road at Chino Hills Parkway

PM PEAK HOUR

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** INPUT DATA *** Modified by: COMSIS Corp. (M. Roskin) 4/9/86
Modified by: FHWA 12/21/87

APPROACH	TURN MOVEMENT	BY COUNT	APPROACH	FY TOTAL
NORTH BOUND	LEFT	234	NORTHBOUND	
	THRU	0	IN ...	2,151
	RIGHT	1168	OUT ...	974
SOUTH BOUND	LEFT	12	SOUTHBOUND	
	THRU	0	IN ...	24
	RIGHT	0	OUT ...	44
EAST BOUND	LEFT	9	EASTBOUND	
	THRU	647	IN ...	535
	RIGHT	164	OUT ...	824
WEST BOUND	LEFT	380	WESTBOUND	
	THRU	628	IN ...	1,511
	RIGHT	11	OUT ...	2,377

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** RESULTS *** Modified by: COMSIS Corp. (M. Roskin) 2/13/86

APPROACH	TURN MOVEMENT	BY COUNT	FY FORECAST
NORTH BOUND	LEFT	234	285
	THRU	0	1
	RIGHT	1,168	1,950
SOUTH BOUND	LEFT	12	24
	THRU	0	1
	RIGHT	0	1
EAST BOUND	LEFT	9	12
	THRU	647	821
	RIGHT	164	210
WEST BOUND	LEFT	380	851
	THRU	628	791
	RIGHT	11	35

5. Peyton Drive at Chino Hills Parkway

PM PEAK HOUR

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** INPUT DATA *** Modified by: COMSIS Corp. (M. Roskin) 4/9/86
Modified by: FHWA 12/21/87

APPROACH	TURN MOVEMENT	BY COUNT	APPROACH	FY TOTAL
NORTH BOUND	LEFT	138	NORTHBOUND	
	THRU	253	IN ...	585
	RIGHT	181	OUT ...	1,010
SOUTH BOUND	LEFT	309	SOUTHBOUND	
	THRU	379	IN ...	877
	RIGHT	134	OUT ...	871
EAST BOUND	LEFT	301	EASTBOUND	
	THRU	1078	IN ...	2,278
	RIGHT	363	OUT ...	1,492
WEST BOUND	LEFT	233	WESTBOUND	
	THRU	722	IN ...	1,660
	RIGHT	270	OUT ...	2,027

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** RESULTS *** Modified by: COMSIS Corp. (M. Roskin) 2/13/86

APPROACH	TURN MOVEMENT	BY COUNT	FY FORECAST
NORTH BOUND	LEFT	138	177
	THRU	253	300
	RIGHT	181	213
SOUTH BOUND	LEFT	309	399
	THRU	379	448
	RIGHT	134	186
EAST BOUND	LEFT	301	359
	THRU	1,078	1,499
	RIGHT	363	454
WEST BOUND	LEFT	233	274
	THRU	722	1,129
	RIGHT	270	349

6. Peyton Drive at Woodview Road

PM PEAK HOUR

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** INPUT DATA *** Modified by: COMSIS Corp. (M. Roskin) 4/9/86
Modified by: FHWA 12/21/87

APPROACH	TURN MOVEMENT	BY COUNT	APPROACH	FY TOTAL
NORTH BOUND	LEFT	0	NORTHBOUND	
	THRU	0	IN ...	0
	RIGHT	0	OUT ...	0
SOUTH BOUND	LEFT	170	SOUTHBOUND	
	THRU	0	IN ...	281
	RIGHT	59	OUT ...	170
EAST BOUND	LEFT	36	EASTBOUND	
	THRU	23	IN ...	148
	RIGHT	0	OUT ...	163
WEST BOUND	LEFT	0	WESTBOUND	
	THRU	33	IN ...	200
	RIGHT	100	OUT ...	296

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** RESULTS *** Modified by: COMSIS Corp. (M. Roskin) 2/13/86

APPROACH	TURN MOVEMENT	BY COUNT	FY FORECAST
NORTH BOUND	LEFT	0	0
	THRU	0	0
	RIGHT	0	0
SOUTH BOUND	LEFT	170	236
	THRU	0	0
	RIGHT	59	74
EAST BOUND	LEFT	36	59
	THRU	23	89
	RIGHT	0	0
WEST BOUND	LEFT	0	0
	THRU	33	89
	RIGHT	100	143

7. Pipeline Avenue at Woodview Road

PM PEAK HOUR

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** INPUT DATA *** Modified by: COMSIS Corp. (M. Roskin) 4/9/86
Modified by: FHWA 12/21/87

APPROACH	TURN MOVEMENT	BY COUNT	APPROACH	FY TOTAL
NORTH BOUND	LEFT	114	NORTHBOUND	
	THRU	200	IN ...	391
	RIGHT	0	OUT ...	522
SOUTH BOUND	LEFT	0	SOUTHBOUND	
	THRU	268	IN ...	291
	RIGHT	18	OUT ...	263
EAST BOUND	LEFT	18	EASTBOUND	
	THRU	0	IN ...	303
	RIGHT	182	OUT ...	199
WEST BOUND	LEFT	0	WESTBOUND	
	THRU	0	IN ...	0
	RIGHT	0	OUT ...	0

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** RESULTS *** Modified by: COMSIS Corp. (M. Roskin) 2/13/86

APPROACH	TURN MOVEMENT	BY COUNT	FY FORECAST
NORTH BOUND	LEFT	114	208
	THRU	200	278
	RIGHT	0	0
SOUTH BOUND	LEFT	0	0
	THRU	268	342
	RIGHT	18	71
EAST BOUND	LEFT	18	55
	THRU	0	0
	RIGHT	182	264
WEST BOUND	LEFT	0	0
	THRU	0	0
	RIGHT	0	0

8. Pipeline Avenue at Soquel Canyon Parkway

PM PEAK HOUR

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** INPUT DATA *** Modified by: COMSIS Corp. (M. Roskin) 4/9/86
Modified by: FHWA 12/21/87

APPROACH	TURN MOVEMENT	BY COUNT	APPROACH	FY TOTAL
NORTH BOUND	LEFT	0	NORTHBOUND	
	THRU	0	IN ...	0
	RIGHT	0	OUT ...	0
SOUTH BOUND	LEFT	404	SOUTHBOUND	
	THRU	0	IN ...	483
	RIGHT	22	OUT ...	396
EAST BOUND	LEFT	14	EASTBOUND	
	THRU	27	IN ...	41
	RIGHT	0	OUT ...	51
WEST BOUND	LEFT	0	WESTBOUND	
	THRU	29	IN ...	411
	RIGHT	310	OUT ...	488

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** RESULTS *** Modified by: COMSIS Corp. (M. Roskin) 2/13/86

APPROACH	TURN MOVEMENT	BY COUNT	FY FORECAST
NORTH BOUND	LEFT	0	0
	THRU	0	0
	RIGHT	0	0
SOUTH BOUND	LEFT	404	547
	THRU	0	0
	RIGHT	22	27
EAST BOUND	LEFT	14	18
	THRU	27	38
	RIGHT	0	0
WEST BOUND	LEFT	0	0
	THRU	29	42
	RIGHT	310	485

9. Soquel Canyon Parkway at Los Serranos Country Club Drive/Butterfield Ranch Road

PM PEAK HOUR

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** INPUT DATA *** Modified by: COMSIS Corp. (M. Roskin) 4/9/86
Modified by: FHWA 12/21/87

APPROACH	TURN MOVEMENT	BY COUNT	APPROACH	FY TOTAL
NORTH BOUND	LEFT	33	NORTHBOUND	
	THRU	346	IN ...	550
	RIGHT	114	OUT ...	833
SOUTH BOUND	LEFT	306	SOUTHBOUND	
	THRU	562	IN ...	1215
	RIGHT	219	OUT ...	1068
EAST BOUND	LEFT	361	EASTBOUND	
	THRU	216	IN ...	631
	RIGHT	37	OUT ...	447
WEST BOUND	LEFT	162	WESTBOUND	
	THRU	132	IN ...	681
	RIGHT	267	OUT ...	731

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** RESULTS *** Modified by: COMSIS Corp. (M. Roskin) 2/13/86

APPROACH	TURN MOVEMENT	BY COUNT	FY FORECAST
NORTH BOUND	LEFT	33	40
	THRU	346	450
	RIGHT	114	152
SOUTH BOUND	LEFT	306	385
	THRU	562	749
	RIGHT	219	263
EAST BOUND	LEFT	361	427
	THRU	216	285
	RIGHT	37	43
WEST BOUND	LEFT	162	213
	THRU	132	185
	RIGHT	267	326

10. Soquel Canyon Parkway at Pomona Rincon Road

PM PEAK HOUR

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** INPUT DATA *** Modified by: COMSIS Corp. (M. Roskin) 4/9/86
Modified by: FHWA 12/21/87

APPROACH	TURN MOVEMENT	BY COUNT	APPROACH	FY TOTAL
NORTH BOUND	LEFT	29	NORTHBOUND	
	THRU	721	IN ...	1074
	RIGHT	230	OUT ...	1178
SOUTH BOUND	LEFT	559	SOUTHBOUND	
	THRU	919	IN ...	1669
	RIGHT	62	OUT ...	1136
EAST BOUND	LEFT	62	EASTBOUND	
	THRU	27	IN ...	99
	RIGHT	10	OUT ...	95
WEST BOUND	LEFT	121	WESTBOUND	
	THRU	4	IN ...	384
	RIGHT	259	OUT ...	816

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** RESULTS *** Modified by: COMSIS Corp. (M. Roskin) 2/13/86

APPROACH	TURN MOVEMENT	BY COUNT	FY FORECAST
NORTH BOUND	LEFT	29	34
	THRU	721	914
	RIGHT	230	293
SOUTH BOUND	LEFT	559	750
	THRU	919	1,188
	RIGHT	62	72
EAST BOUND	LEFT	62	72
	THRU	27	32
	RIGHT	10	12
WEST BOUND	LEFT	121	176
	THRU	4	4
	RIGHT	259	490

11. Peyton Drive at Grand Avenue

PM PEAK HOUR

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** INPUT DATA *** Modified by: COMSIS Corp. (M. Roskin) 4/9/86
Modified by: FHWA 12/21/87

APPROACH	TURN MOVEMENT	BY COUNT	APPROACH	FY TOTAL
NORTH BOUND	LEFT	123	NORTHBOUND	
	THRU	599	IN ...	929
	RIGHT	152	OUT ...	1,046
SOUTH BOUND	LEFT	204	SOUTHBOUND	
	THRU	599	IN ...	1,030
	RIGHT	150	OUT ...	1,159
EAST BOUND	LEFT	309	EASTBOUND	
	THRU	757	IN ...	1,648
	RIGHT	148	OUT ...	1,001
WEST BOUND	LEFT	235	WESTBOUND	
	THRU	379	IN ...	1,142
	RIGHT	233	OUT ...	1,542

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** RESULTS *** Modified by: COMSIS Corp. (M. Roskin) 2/13/86

APPROACH	TURN MOVEMENT	BY COUNT	FY FORECAST
NORTH BOUND	LEFT	123	178
	THRU	599	730
	RIGHT	152	188
SOUTH BOUND	LEFT	204	238
	THRU	599	735
	RIGHT	150	205
EAST BOUND	LEFT	309	366
	THRU	757	1,117
	RIGHT	148	183
WEST BOUND	LEFT	235	275
	THRU	379	619
	RIGHT	233	282

12. Carbon Canyon Road at Fairway Drive/Ginseng Lane

PM PEAK HOUR

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** INPUT DATA *** Modified by: COMSIS Corp. (M. Roskin) 4/9/86
Modified by: FHWA 12/21/87

APPROACH	TURN MOVEMENT	BY COUNT	APPROACH	FY TOTAL
NORTH BOUND	LEFT	7	NORTHBOUND	
	THRU	1226	IN ...	1,986
	RIGHT	4	OUT ...	855
SOUTH BOUND	LEFT	8	SOUTHBOUND	
	THRU	413	IN ...	862
	RIGHT	11	OUT ...	1,991
EAST BOUND	LEFT	16	EASTBOUND	
	THRU	0	IN ...	28
	RIGHT	12	OUT ...	18
WEST BOUND	LEFT	0	WESTBOUND	
	THRU	0	IN ...	0
	RIGHT	0	OUT ...	12

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** RESULTS *** Modified by: COMSIS Corp. (M. Roskin) 2/13/86

APPROACH	TURN MOVEMENT	BY COUNT	FY FORECAST
NORTH BOUND	LEFT	7	8
	THRU	1,226	1,975
	RIGHT	4	4
SOUTH BOUND	LEFT	8	9
	THRU	413	843
	RIGHT	11	12
EAST BOUND	LEFT	16	19
	THRU	0	0
	RIGHT	12	14
WEST BOUND	LEFT	0	0
	THRU	0	0
	RIGHT	0	0

13. Carbon Canyon Road at Canyon Hills Road

PM PEAK HOUR

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** INPUT DATA *** Modified by: COMSIS Corp. (M. Roskin) 4/9/86
Modified by: FHWA 12/21/87

APPROACH	TURN MOVEMENT	BY COUNT	APPROACH	FY TOTAL
NORTH BOUND	LEFT	11	NORTHBOUND	
	THRU	1223	IN ...	1,983
	RIGHT	0	OUT ...	785
SOUTH BOUND	LEFT	0	SOUTHBOUND	
	THRU	335	IN ...	801
	RIGHT	36	OUT ...	1,996
EAST BOUND	LEFT	24	EASTBOUND	
	THRU	0	IN ...	44
	RIGHT	20	OUT ...	47
WEST BOUND	LEFT	0	WESTBOUND	
	THRU	0	IN ...	0
	RIGHT	0	OUT ...	0

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** RESULTS *** Modified by: COMSIS Corp. (M. Roskin) 2/13/86

APPROACH	TURN MOVEMENT	BY COUNT	FY FORECAST
NORTH BOUND	LEFT	11	27
	THRU	1,223	1,973
	RIGHT	0	15
SOUTH BOUND	LEFT	0	19
	THRU	335	764
	RIGHT	36	60
EAST BOUND	LEFT	24	38
	THRU	0	0
	RIGHT	20	32
WEST BOUND	LEFT	0	8
	THRU	0	0
	RIGHT	0	11

1. Grand Avenue, east of Peyton Drive

DAILY PEAK HOUR

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** INPUT DATA *** Modified by: COMSIS Corp. (M. Roskin) 4/9/86
Modified by: FHWA 12/21/87

APPROACH	TURN MOVEMENT	BY COUNT	APPROACH	FY TOTAL
NORTH BOUND	LEFT	0	NORTHBOUND	
	THRU	27963	IN ...	35946
	RIGHT	0	OUT ...	0
SOUTH BOUND	LEFT	0	SOUTHBOUND	
	THRU	0	IN ...	0
	RIGHT	0	OUT ...	35946
EAST BOUND	LEFT	0	EASTBOUND	
	THRU	0	IN ...	0
	RIGHT	0	OUT ...	0
WEST BOUND	LEFT	0	WESTBOUND	
	THRU	0	IN ...	0
	RIGHT	0	OUT ...	0

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** RESULTS *** Modified by: COMSIS Corp. (M. Roskin) 2/13/86

APPROACH	TURN MOVEMENT	BY COUNT	FY FORECAST
NORTH BOUND	LEFT	0	0
	THRU	27,963	35,946
	RIGHT	0	0
SOUTH BOUND	LEFT	0	0
	THRU	0	0
	RIGHT	0	0
EAST BOUND	LEFT	0	0
	THRU	0	0
	RIGHT	0	0
WEST BOUND	LEFT	0	0
	THRU	0	0
	RIGHT	0	0

2. Boys Republic Drive, south of Shoppes Drive

DAILY PEAK HOUR

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** INPUT DATA *** Modified by: COMSIS Corp. (M. Roskin) 4/9/86
Modified by: FHWA 12/21/87

APPROACH	TURN MOVEMENT	BY COUNT	APPROACH	FY TOTAL
NORTH BOUND	LEFT	0	NORTHBOUND	
	THRU	13829	IN ...	10330
	RIGHT	0	OUT ...	0
SOUTH BOUND	LEFT	0	SOUTHBOUND	
	THRU	0	IN ...	0
	RIGHT	0	OUT ...	10330
EAST BOUND	LEFT	0	EASTBOUND	
	THRU	0	IN ...	0
	RIGHT	0	OUT ...	0
WEST BOUND	LEFT	0	WESTBOUND	
	THRU	0	IN ...	0
	RIGHT	0	OUT ...	0

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** RESULTS *** Modified by: COMSIS Corp. (M. Roskin) 2/13/86

APPROACH	TURN MOVEMENT	BY COUNT	FY FORECAST
NORTH BOUND	LEFT	0	0
	THRU	13,829	16,262
	RIGHT	0	0
SOUTH BOUND	LEFT	0	0
	THRU	0	0
	RIGHT	0	0
EAST BOUND	LEFT	0	0
	THRU	0	0
	RIGHT	0	0
WEST BOUND	LEFT	0	0
	THRU	0	0
	RIGHT	0	0

3. Peyton Drive, south of Eucalyptus Avenue

DAILY PEAK HOUR

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** INPUT DATA *** Modified by: COMSIS Corp. (M. Roskin) 4/9/86
Modified by: FHWA 12/21/87

APPROACH	TURN MOVEMENT	BY COUNT	APPROACH	FY TOTAL
NORTH BOUND	LEFT	0	NORTHBOUND	
	THRU	21416	IN ...	22,666
	RIGHT	0	OUT ...	0
SOUTH BOUND	LEFT	0	SOUTHBOUND	
	THRU	0	IN ...	0
	RIGHT	0	OUT ...	22,666
EAST BOUND	LEFT	0	EASTBOUND	
	THRU	0	IN ...	0
	RIGHT	0	OUT ...	0
WEST BOUND	LEFT	0	WESTBOUND	
	THRU	0	IN ...	0
	RIGHT	0	OUT ...	0

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** RESULTS *** Modified by: COMSIS Corp. (M. Roskin) 2/13/86

APPROACH	TURN MOVEMENT	BY COUNT	FY FORECAST
NORTH BOUND	LEFT	0	0
	THRU	21,416	26,929
	RIGHT	0	0
SOUTH BOUND	LEFT	0	0
	THRU	0	0
	RIGHT	0	0
EAST BOUND	LEFT	0	0
	THRU	0	0
	RIGHT	0	0
WEST BOUND	LEFT	0	0
	THRU	0	0
	RIGHT	0	0

4. Carbon Canyon Road, south of Chino Hills Parkway

DAILY PEAK HOUR

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** INPUT DATA *** Modified by: COMSIS Corp. (M. Roskin) 4/9/86
Modified by: FHWA 12/21/87

APPROACH	TURN MOVEMENT	BY COUNT	APPROACH	FY TOTAL
NORTH BOUND	LEFT	0	NORTHBOUND	
	THRU	21046	IN ...	32,965
	RIGHT	0	OUT ...	0
SOUTH BOUND	LEFT	0	SOUTHBOUND	
	THRU	0	IN ...	0
	RIGHT	0	OUT ...	32,965
EAST BOUND	LEFT	0	EASTBOUND	
	THRU	0	IN ...	0
	RIGHT	0	OUT ...	0
WEST BOUND	LEFT	0	WESTBOUND	
	THRU	0	IN ...	0
	RIGHT	0	OUT ...	0

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** RESULTS *** Modified by: COMSIS Corp. (M. Roskin) 2/13/86

APPROACH	TURN MOVEMENT	BY COUNT	FY FORECAST
NORTH BOUND	LEFT	0	0
	THRU	21,046	32,965
	RIGHT	0	0
SOUTH BOUND	LEFT	0	0
	THRU	0	0
	RIGHT	0	0
EAST BOUND	LEFT	0	0
	THRU	0	0
	RIGHT	0	0
WEST BOUND	LEFT	0	0
	THRU	0	0
	RIGHT	0	0

5. Chino Hills Parkway, east of Carbon Canyon Road

DAILY PEAK HOUR

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** INPUT DATA *** Modified by: COMSIS Corp. (M. Roskin) 4/9/86
Modified by: FHWA 12/21/87

APPROACH	TURN MOVEMENT	BY COUNT	APPROACH	FY TOTAL
NORTH BOUND	LEFT	0	NORTHBOUND	
	THRU	29618	IN ...	40,677
	RIGHT	0	OUT ...	0
SOUTH BOUND	LEFT	0	SOUTHBOUND	
	THRU	0	IN ...	0
	RIGHT	0	OUT ...	40,677
EAST BOUND	LEFT	0	EASTBOUND	
	THRU	0	IN ...	0
	RIGHT	0	OUT ...	0
WEST BOUND	LEFT	0	WESTBOUND	
	THRU	0	IN ...	0
	RIGHT	0	OUT ...	0

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** RESULTS *** Modified by: COMSIS Corp. (M. Roskin) 2/13/86

APPROACH	TURN MOVEMENT	BY COUNT	FY FORECAST
NORTH BOUND	LEFT	0	0
	THRU	29,618	40,677
	RIGHT	0	0
SOUTH BOUND	LEFT	0	0
	THRU	0	0
	RIGHT	0	0
EAST BOUND	LEFT	0	0
	THRU	0	0
	RIGHT	0	0
WEST BOUND	LEFT	0	0
	THRU	0	0
	RIGHT	0	0

6. Chino Hills Parkway, east of Peyton Drive

DAILY PEAK HOUR

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** INPUT DATA *** Modified by: COMSIS Corp. (M. Roskin) 4/9/86
Modified by: FHWA 12/21/87

APPROACH	TURN MOVEMENT	BY COUNT	APPROACH	FY TOTAL
NORTH BOUND	LEFT	0	NORTHBOUND	
	THRU	28124	IN ...	37,568
	RIGHT	0	OUT ...	0
SOUTH BOUND	LEFT	0	SOUTHBOUND	
	THRU	0	IN ...	0
	RIGHT	0	OUT ...	37,568
EAST BOUND	LEFT	0	EASTBOUND	
	THRU	0	IN ...	0
	RIGHT	0	OUT ...	0
WEST BOUND	LEFT	0	WESTBOUND	
	THRU	0	IN ...	0
	RIGHT	0	OUT ...	0

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** RESULTS *** Modified by: COMSIS Corp. (M. Roskin) 2/13/86

APPROACH	TURN MOVEMENT	BY COUNT	FY FORECAST
NORTH BOUND	LEFT	0	0
	THRU	28,124	37,568
	RIGHT	0	0
SOUTH BOUND	LEFT	0	0
	THRU	0	0
	RIGHT	0	0
EAST BOUND	LEFT	0	0
	THRU	0	0
	RIGHT	0	0
WEST BOUND	LEFT	0	0
	THRU	0	0
	RIGHT	0	0

7. Peyton Drive, north of Woodview Road

DAILY PEAK HOUR

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** INPUT DATA *** Modified by: COMSIS Corp. (M. Roskin) 4/9/86
Modified by: FHWA 12/21/87

APPROACH	TURN MOVEMENT	BY COUNT	APPROACH	FY TOTAL
NORTH BOUND	LEFT	0	NORTHBOUND	
	THRU	4740	IN ...	5,273
	RIGHT	0	OUT ...	0
SOUTH BOUND	LEFT	0	SOUTHBOUND	
	THRU	0	IN ...	0
	RIGHT	0	OUT ...	5,273
EAST BOUND	LEFT	0	EASTBOUND	
	THRU	0	IN ...	0
	RIGHT	0	OUT ...	0
WEST BOUND	LEFT	0	WESTBOUND	
	THRU	0	IN ...	0
	RIGHT	0	OUT ...	0

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** RESULTS *** Modified by: COMSIS Corp. (M. Roskin) 2/13/86

APPROACH	TURN MOVEMENT	BY COUNT	FY FORECAST
NORTH BOUND	LEFT	0	0
	THRU	4,740	6,372
	RIGHT	0	0
SOUTH BOUND	LEFT	0	0
	THRU	0	0
	RIGHT	0	0
EAST BOUND	LEFT	0	0
	THRU	0	0
	RIGHT	0	0
WEST BOUND	LEFT	0	0
	THRU	0	0
	RIGHT	0	0

8. Woodview Road, east of Peyton Drive

DAILY PEAK HOUR

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** INPUT DATA *** Modified by: COMSIS Corp. (M. Roskin) 4/9/86
Modified by: FHWA 12/21/87

APPROACH	TURN MOVEMENT	BY COUNT	APPROACH	FY TOTAL
NORTH	LEFT	0	NORTHBOUND	
BOUND	THRU	4092	IN ...	4,936
	RIGHT	0	OUT ...	0
SOUTH	LEFT	0	SOUTHBOUND	
BOUND	THRU	0	IN ...	0
	RIGHT	0	OUT ...	4,936
EAST	LEFT	0	EASTBOUND	
BOUND	THRU	0	IN ...	0
	RIGHT	0	OUT ...	0
WEST	LEFT	0	WESTBOUND	
BOUND	THRU	0	IN ...	0
	RIGHT	0	OUT ...	0

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** RESULTS *** Modified by: COMSIS Corp. (M. Roskin) 2/13/86

APPROACH	TURN MOVEMENT	BY COUNT	FY FORECAST
NORTH	LEFT	0	0
BOUND	THRU	4,092	7,345
	RIGHT	0	0
SOUTH	LEFT	0	0
BOUND	THRU	0	0
	RIGHT	0	0
EAST	LEFT	0	0
BOUND	THRU	0	0
	RIGHT	0	0
WEST	LEFT	0	0
BOUND	THRU	0	0
	RIGHT	0	0

9. Pipeline Avenue, south of Woodview Road

DAILY PEAK HOUR

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** INPUT DATA *** Modified by: COMSIS Corp. (M. Roskin) 4/9/86
Modified by: FHWA 12/21/87

APPROACH	TURN MOVEMENT	BY COUNT	APPROACH	FY TOTAL
NORTH BOUND	LEFT	0	NORTHBOUND	
	THRU	8901	IN ...	9783
	RIGHT	0	OUT ...	0
SOUTH BOUND	LEFT	0	SOUTHBOUND	
	THRU	0	IN ...	0
	RIGHT	0	OUT ...	9783
EAST BOUND	LEFT	0	EASTBOUND	
	THRU	0	IN ...	0
	RIGHT	0	OUT ...	0
WEST BOUND	LEFT	0	WESTBOUND	
	THRU	0	IN ...	0
	RIGHT	0	OUT ...	0

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** RESULTS *** Modified by: COMSIS Corp. (M. Roskin) 2/13/86

APPROACH	TURN MOVEMENT	BY COUNT	FY FORECAST
NORTH BOUND	LEFT	0	0
	THRU	8,901	12,647
	RIGHT	0	0
SOUTH BOUND	LEFT	0	0
	THRU	0	0
	RIGHT	0	0
EAST BOUND	LEFT	0	0
	THRU	0	0
	RIGHT	0	0
WEST BOUND	LEFT	0	0
	THRU	0	0
	RIGHT	0	0

10. Pipeline Avenue, north of Soquel Canyon Parkway

DAILY PEAK HOUR

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** INPUT DATA *** Modified by: COMSIS Corp. (M. Roskin) 4/9/86
Modified by: FHWA 12/21/87

APPROACH	TURN MOVEMENT	BY COUNT	APPROACH	FY TOTAL
NORTH BOUND	LEFT	0	NORTHBOUND	
	THRU	8646	IN ...	9360
	RIGHT	0	OUT ...	0
SOUTH BOUND	LEFT	0	SOUTHBOUND	
	THRU	0	IN ...	0
	RIGHT	0	OUT ...	9360
EAST BOUND	LEFT	0	EASTBOUND	
	THRU	0	IN ...	0
	RIGHT	0	OUT ...	0
WEST BOUND	LEFT	0	WESTBOUND	
	THRU	0	IN ...	0
	RIGHT	0	OUT ...	0

FUTURE DIRECTIONAL TURN VOLUMES FROM FUTURE DIRECTIONAL LINK VOLUMES
NCHRP 255, PAGE 105 Written by: FHWA (C. Fleet)
*** RESULTS *** Modified by: COMSIS Corp. (M. Roskin) 2/13/86

APPROACH	TURN MOVEMENT	BY COUNT	FY FORECAST
NORTH BOUND	LEFT	0	0
	THRU	8,646	12,467
	RIGHT	0	0
SOUTH BOUND	LEFT	0	0
	THRU	0	0
	RIGHT	0	0
EAST BOUND	LEFT	0	0
	THRU	0	0
	RIGHT	0	0
WEST BOUND	LEFT	0	0
	THRU	0	0
	RIGHT	0	0

APPENDIX E

YEAR 2029 TRAFFIC CONDITIONS INTERSECTION LEVEL OF SERVICE CALCULATION WORKSHEETS

APPENDIX E-I

YEAR 2029 WITHOUT PROJECT TRAFFIC CONDITIONS

Intersection Level Of Service Report
Intersection 1: Peyton Drive at Chino Avenue

Control Type:	Signalized	Delay (sec / veh):	38.5
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.528

Intersection Setup

Name	Peyton Drive			Peyton Drive			Chino Avenue			Chino Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	0	1	0	0	1	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Peyton Drive			Peyton Drive			Chino Avenue			Chino Avenue		
Base Volume Input [veh/h]	183	557	136	167	463	228	255	365	143	122	356	135
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	183	557	136	167	463	228	255	365	143	122	356	135
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	48	147	36	44	122	60	67	96	38	32	94	36
Total Analysis Volume [veh/h]	193	586	143	176	487	240	268	384	151	128	375	142
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	1	6	0	5	2	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	12	35	0	12	35	0	34	39	0	34	39	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	24	0	0	24	0	0	28	0	0	28	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	C	L	C	C	L	C	R
C, Cycle Length [s]	120	120	120	120	120	120	120	120	120	120	120	120
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	8	60	60	8	60	60	21	25	25	11	15	15
g / C, Green / Cycle	0.07	0.50	0.50	0.07	0.50	0.50	0.17	0.21	0.21	0.09	0.13	0.13
(v / s)_i Volume / Saturation Flow Rate	0.06	0.14	0.13	0.06	0.14	0.13	0.16	0.10	0.09	0.08	0.10	0.08
s, saturation flow rate [veh/h]	3200	3600	1800	3200	3600	1800	1700	3600	1800	1700	3600	1800
c, Capacity [veh/h]	216	1786	893	216	1786	893	298	762	381	156	462	231
d1, Uniform Delay [s]	55.57	17.67	17.56	55.26	17.64	17.60	48.49	41.52	41.21	53.55	50.92	49.52
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.18	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	12.27	0.38	0.73	7.38	0.38	0.74	14.77	0.47	0.82	10.10	3.49	2.65
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.90	0.28	0.27	0.82	0.27	0.27	0.90	0.48	0.45	0.82	0.81	0.61
d, Delay for Lane Group [s/veh]	67.84	18.05	18.29	62.63	18.01	18.34	63.27	41.99	42.04	63.64	54.41	52.17
Lane Group LOS	E	B	B	E	B	B	E	D	D	E	D	D
Critical Lane Group	Yes	No	No	No	Yes	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	3.27	4.06	3.97	2.85	4.01	4.03	9.06	4.80	4.49	4.23	5.70	4.21
50th-Percentile Queue Length [ft/ln]	81.64	101.44	99.21	71.23	100.18	100.80	226.40	119.98	112.24	105.78	142.62	105.17
95th-Percentile Queue Length [veh/ln]	5.88	7.30	7.14	5.13	7.21	7.26	13.99	8.39	7.96	7.60	9.62	7.57
95th-Percentile Queue Length [ft/ln]	146.95	182.60	178.58	128.21	180.33	181.45	349.79	209.79	199.11	190.12	240.55	189.26

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	67.84	18.09	18.29	62.63	18.01	18.34	63.27	41.99	42.04	63.64	54.41	52.17
Movement LOS	E	B	B	E	B	B	E	D	D	E	D	D
d_A, Approach Delay [s/veh]	28.53			26.80			49.10			55.75		
Approach LOS	C			C			D			E		
d_I, Intersection Delay [s/veh]	38.46											
Intersection LOS	D											
Intersection V/C	0.528											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	49.52	49.52	49.52	49.52
l_p,int, Pedestrian LOS Score for Intersection	2.945	2.971	2.832	2.795
Crosswalk LOS	C	C	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	517	517	583	583
d_b, Bicycle Delay [s]	33.02	33.02	30.12	30.12
l_b,int, Bicycle LOS Score for Intersection	2.067	2.056	2.001	2.092
Bicycle LOS	B	B	B	B

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 2: Gateway Village/Boys Republic Drive at Grand Avenue

Control Type:	Signalized	Delay (sec / veh):	37.2
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.745

Intersection Setup

Name	Boys Republic Drive			Gateway Village			Grand Avenue			Grand Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	1	1	0	0	1	0	0	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			No		

Volumes

Name	Boys Republic Drive			Gateway Village			Grand Avenue			Grand Avenue		
Base Volume Input [veh/h]	12	29	284	88	35	35	55	649	4	483	949	82
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	12	29	284	88	35	35	55	649	4	483	949	82
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	8	75	23	9	9	14	171	1	127	250	22
Total Analysis Volume [veh/h]	13	31	299	93	37	37	58	683	4	508	999	86
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Split	Split	Split	Split	Split	Split	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	0	8	0	0	4	0	5	2	0	1	6	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	0	6	0	0	6	0	6	6	0	6	6	0
Maximum Green [s]	0	30	0	0	30	0	30	30	0	30	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	10	0	0	35	0	53	25	0	50	22	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	0	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	24	0	0	14	0	0	11	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall		No			No		No	No		No	No	
Maximum Recall		No			No		No	No		No	No	
Pedestrian Recall		No			No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	R	L	C	L	C	C	L	C	C
C, Cycle Length [s]	120	120	120	120	120	120	120	120	120	120
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	22	22	8	8	5	36	36	38	68	68
g / C, Green / Cycle	0.18	0.18	0.07	0.07	0.04	0.30	0.30	0.32	0.57	0.57
(v / s)_i Volume / Saturation Flow Rate	0.03	0.17	0.05	0.05	0.03	0.13	0.13	0.30	0.20	0.20
s, saturation flow rate [veh/h]	1700	1800	1700	1700	1700	3600	1800	1700	3600	1800
c, Capacity [veh/h]	312	330	117	117	77	1072	536	538	2047	1024
d1, Uniform Delay [s]	41.10	48.02	54.76	54.71	56.65	33.87	34.10	40.02	13.97	14.00
k, delay calibration	0.11	0.20	0.11	0.11	0.11	0.50	0.50	0.30	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.20	15.61	7.91	7.46	13.46	1.21	2.62	19.32	0.48	0.97
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.14	0.91	0.72	0.70	0.75	0.42	0.44	0.94	0.35	0.36
d, Delay for Lane Group [s/veh]	41.31	63.62	62.67	62.17	70.11	35.08	36.72	59.34	14.45	14.97
Lane Group LOS	D	E	E	E	E	D	D	E	B	B
Critical Lane Group	No	Yes	Yes	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	1.12	10.16	2.76	2.69	2.03	5.47	5.97	17.31	5.31	5.50
50th-Percentile Queue Length [ft/ln]	27.92	253.93	68.93	67.34	50.73	136.77	149.32	432.84	132.70	137.59
95th-Percentile Queue Length [veh/ln]	2.01	15.38	4.96	4.85	3.65	9.31	9.98	24.14	9.09	9.35
95th-Percentile Queue Length [ft/ln]	50.26	384.60	124.08	121.22	91.31	232.67	249.53	603.44	227.16	233.77

Movement, Approach, & Intersection Results

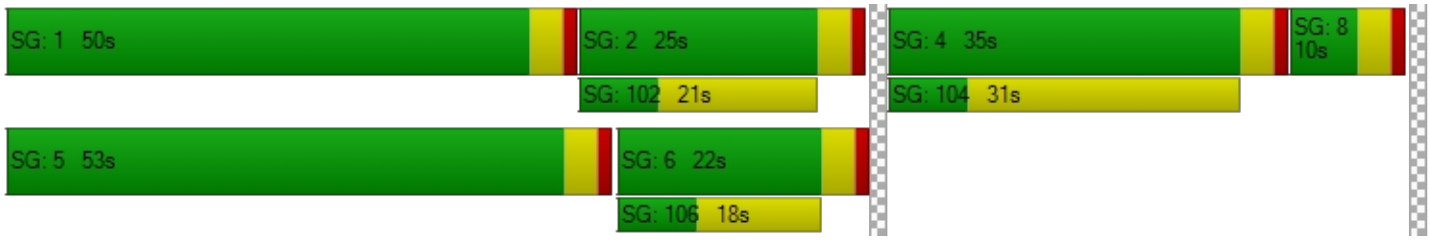
d_M, Delay for Movement [s/veh]	41.31	41.31	63.62	62.62	62.17	62.17	70.11	35.64	36.72	59.34	14.60	14.97
Movement LOS	D	D	E	E	E	E	E	D	D	E	B	B
d_A, Approach Delay [s/veh]	60.76			62.42			38.33			28.88		
Approach LOS	E			E			D			C		
d_I, Intersection Delay [s/veh]	37.16											
Intersection LOS	D											
Intersection V/C	0.745											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	0.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	49.54	49.54	49.54	0.00
l_p,int, Pedestrian LOS Score for Intersection	2.362	2.065	2.858	0.000
Crosswalk LOS	B	B	C	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	100	516	350	300
d_b, Bicycle Delay [s]	54.18	33.03	40.87	43.38
l_b,int, Bicycle LOS Score for Intersection	2.126	1.835	1.969	2.436
Bicycle LOS	B	A	A	B

Sequence

Ring 1	1	2	4	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 3: Peyton Drive at Eucalyptus Avenue

Control Type:	Signalized	Delay (sec / veh):	19.1
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.486

Intersection Setup

Name	Peyton Drive			Peyton Drive			Eucalyptus Avenue			Eucalyptus Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	1	1	0	0	1	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Peyton Drive			Peyton Drive			Eucalyptus Avenue			Eucalyptus Avenue		
Base Volume Input [veh/h]	19	645	121	196	539	256	282	128	11	142	120	286
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	19	645	121	196	539	256	282	128	11	142	120	286
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	5	170	32	52	142	67	74	34	3	37	32	75
Total Analysis Volume [veh/h]	20	679	127	206	567	269	297	135	12	149	126	301
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal Group	1	6	0	5	2	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	6	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	10	29	0	10	29	0	10	41	0	10	41	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	18	0	0	14	0	0	21	0	0	24	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		Yes	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	R	L	C	C	L	C	R
C, Cycle Length [s]	90	90	90	90	90	90	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	0.00	0.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	58	48	48	58	52	52	24	24	14	24	14	14
g / C, Green / Cycle	0.64	0.53	0.53	0.64	0.57	0.57	0.27	0.27	0.16	0.27	0.16	0.16
(v / s)_i Volume / Saturation Flow Rate	0.01	0.15	0.15	0.12	0.16	0.15	0.09	0.09	0.08	0.09	0.12	0.11
s, saturation flow rate [veh/h]	1700	3600	1800	1700	3600	1800	1700	1700	1800	1700	1800	1800
c, Capacity [veh/h]	1060	1911	956	1058	2055	1027	382	464	282	345	284	284
d1, Uniform Delay [s]	5.82	11.68	11.64	6.55	9.86	9.77	26.44	26.44	34.93	26.44	36.51	36.09
k, delay calibration	0.11	0.50	0.50	0.50	0.50	0.50	0.49	0.49	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.01	0.37	0.72	0.41	0.33	0.62	2.89	1.77	1.49	0.86	4.76	3.43
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.02	0.28	0.28	0.19	0.28	0.26	0.39	0.32	0.52	0.43	0.78	0.72
d, Delay for Lane Group [s/veh]	5.83	12.05	12.37	6.96	10.19	10.39	29.33	28.20	36.42	27.30	41.28	39.53
Lane Group LOS	A	B	B	A	B	B	C	C	D	C	D	D
Critical Lane Group	No	Yes	No	Yes	No	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.12	2.91	2.94	1.54	2.73	2.65	2.82	2.74	3.03	2.60	5.00	4.47
50th-Percentile Queue Length [ft/ln]	3.11	72.66	73.61	38.42	68.23	66.31	70.47	68.50	75.87	65.08	125.11	111.72
95th-Percentile Queue Length [veh/ln]	0.22	5.23	5.30	2.77	4.91	4.77	5.07	4.93	5.46	4.69	8.67	7.94
95th-Percentile Queue Length [ft/ln]	5.60	130.78	132.49	69.16	122.81	119.36	126.84	123.30	136.57	117.14	216.82	198.40

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	5.83	12.11	12.37	6.96	10.19	10.39	28.76	36.42	36.42	27.30	41.28	40.07
Movement LOS	A	B	B	A	B	B	C	D	D	C	D	D
d_A, Approach Delay [s/veh]	12.00			9.60			31.30			37.04		
Approach LOS	B			A			C			D		
d_I, Intersection Delay [s/veh]	19.10											
Intersection LOS	B											
Intersection V/C	0.486											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	34.72	34.72	34.72	34.72
l_p,int, Pedestrian LOS Score for Intersection	2.917	3.166	2.357	2.665
Crosswalk LOS	C	C	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	555	555	821	821
d_b, Bicycle Delay [s]	23.51	23.51	15.64	15.64
l_b,int, Bicycle LOS Score for Intersection	2.014	2.419	1.926	2.510
Bicycle LOS	B	B	A	B

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 4: Rustic Drive/Carbon Canyon Road at Chino Hills Parkway

Control Type:	Signalized	Delay (sec / veh):	32.8
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.787

Intersection Setup

Name	Carbon Canyon Road			Rustic Drive			Chino Hills Parkway			Chino Hills Parkway		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	1	0	0	1	0	1	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			No		

Volumes

Name	Carbon Canyon Road			Rustic Drive			Chino Hills Parkway			Chino Hills Parkway		
Base Volume Input [veh/h]	215	1	402	6	1	1	17	362	304	1207	734	8
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	215	1	402	6	1	1	17	362	304	1207	734	8
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	57	0	106	2	0	0	4	95	80	318	193	2
Total Analysis Volume [veh/h]	226	1	423	6	1	1	18	381	320	1271	773	8
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	0	8	0	0	4	0	5	2	0	1	6	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	0	6	0	0	6	0	6	6	0	6	6	0
Maximum Green [s]	0	30	0	0	30	0	30	30	0	30	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	32	0	0	32	0	10	29	0	59	78	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	0	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	21	0	0	18	0	0	11	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall		No			No		No	No		No	No	
Maximum Recall		No			No		No	No		No	No	
Pedestrian Recall		No			No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	L	C	R	L	C	C
C, Cycle Length [s]	120	120	120	120	120	120	120	120	120	120	120
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	19	19	19	19	19	3	39	39	51	86	86
g / C, Green / Cycle	0.16	0.16	0.16	0.16	0.16	0.02	0.32	0.32	0.42	0.72	0.72
(v / s)_i Volume / Saturation Flow Rate	0.13	0.12	0.12	0.00	0.00	0.01	0.11	0.18	0.40	0.22	0.22
s, saturation flow rate [veh/h]	1700	1800	1800	1700	1800	1700	3600	1800	3200	1800	1800
c, Capacity [veh/h]	297	281	281	107	281	40	1160	580	1348	1296	1296
d1, Uniform Delay [s]	49.22	48.38	48.37	42.83	42.73	57.80	30.80	33.50	33.32	6.00	6.00
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	4.05	4.07	4.06	0.21	0.01	7.84	0.76	3.75	4.10	0.60	0.60
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.76	0.75	0.75	0.06	0.01	0.45	0.33	0.55	0.94	0.30	0.30
d, Delay for Lane Group [s/veh]	53.27	52.45	52.44	43.04	42.74	65.64	31.56	37.24	37.42	6.59	6.59
Lane Group LOS	D	D	D	D	D	E	C	D	D	A	A
Critical Lane Group	Yes	No	No	No	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	6.91	6.38	6.38	0.16	0.05	0.63	4.32	8.27	18.05	3.42	3.42
50th-Percentile Queue Length [ft/ln]	172.72	159.57	159.44	3.96	1.28	15.66	108.02	206.85	451.26	85.51	85.51
95th-Percentile Queue Length [veh/ln]	11.22	10.53	10.52	0.28	0.09	1.13	7.73	12.99	25.02	6.16	6.16
95th-Percentile Queue Length [ft/ln]	280.48	263.15	262.98	7.12	2.31	28.19	193.24	324.79	625.45	153.93	153.93

Movement, Approach, & Intersection Results

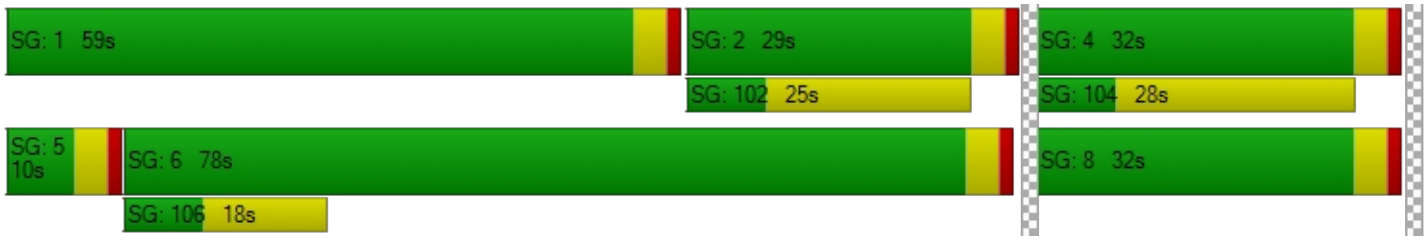
d_M, Delay for Movement [s/veh]	53.27	52.45	52.44	43.04	42.74	42.74	65.64	31.56	37.24	37.42	6.59	6.59
Movement LOS	D	D	D	D	D	D	E	C	D	D	A	A
d_A, Approach Delay [s/veh]	52.73			42.97			34.94			25.69		
Approach LOS	D			D			C			C		
d_I, Intersection Delay [s/veh]	32.79											
Intersection LOS	C											
Intersection V/C	0.787											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	0.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	49.49	49.49	49.49	0.00
l_p,int, Pedestrian LOS Score for Intersection	2.751	1.965	3.067	0.000
Crosswalk LOS	C	A	C	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	467	467	417	1234
d_b, Bicycle Delay [s]	35.25	35.25	37.59	8.81
l_b,int, Bicycle LOS Score for Intersection	2.632	1.573	2.153	3.253
Bicycle LOS	B	A	B	C

Sequence

Ring 1	1	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 5: Peyton Drive at Chino Hills Parkway

Control Type:	Signalized	Delay (sec / veh):	38.5
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.818

Intersection Setup

Name	Peyton Drive			Peyton Drive			Chino Hills Parkway			Chino Hills Parkway		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	1	1	0	0	1	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Peyton Drive			Peyton Drive			Chino Hills Parkway			Chino Hills Parkway		
Base Volume Input [veh/h]	496	393	292	187	214	288	163	520	114	200	1078	272
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	496	393	292	187	214	288	163	520	114	200	1078	272
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	131	103	77	49	56	76	43	137	30	53	284	72
Total Analysis Volume [veh/h]	522	414	307	197	225	303	172	547	120	211	1135	286
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Overlap	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	3	8	0	7	4	4	5	2	0	1	6	0
Auxiliary Signal Groups						4,5						
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	6	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	30	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	1.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	28	41	0	19	32	32	11	32	0	18	39	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	7	0	7	0	0	7	0
Pedestrian Clearance [s]	0	24	0	0	21	21	0	21	0	0	21	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No	No	No	No		No	No	
Maximum Recall	No	No		No	No	No	No	No		No	No	
Pedestrian Recall	No	No		No	No	No	No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	R	L	C	C	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	20	26	26	15	21	32	7	44	44	9	46	46
g / C, Green / Cycle	0.18	0.24	0.24	0.13	0.19	0.29	0.06	0.40	0.40	0.09	0.42	0.42
(v / s)_i Volume / Saturation Flow Rate	0.16	0.21	0.19	0.12	0.06	0.17	0.05	0.19	0.18	0.07	0.32	0.16
s, saturation flow rate [veh/h]	3200	1800	1800	1700	3600	1800	3200	1800	1800	3200	3600	1800
c, Capacity [veh/h]	591	433	433	225	679	521	206	713	713	274	1502	751
d1, Uniform Delay [s]	43.73	40.40	39.02	46.86	38.67	33.44	50.93	24.83	24.48	49.28	27.31	22.23
k, delay calibration	0.11	0.19	0.13	0.11	0.11	0.15	0.11	0.50	0.50	0.11	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	4.59	10.36	3.46	10.19	0.28	1.42	8.55	2.33	2.08	4.57	3.59	1.47
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.88	0.89	0.77	0.87	0.33	0.58	0.83	0.48	0.45	0.77	0.76	0.38
d, Delay for Lane Group [s/veh]	48.32	50.75	42.48	57.05	38.96	34.86	59.48	27.16	26.56	53.85	30.90	23.70
Lane Group LOS	D	D	D	E	D	C	E	C	C	D	C	C
Critical Lane Group	No	Yes	No	Yes	No	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	7.25	11.22	8.80	5.91	2.66	7.08	2.58	7.07	6.54	3.01	13.10	5.37
50th-Percentile Queue Length [ft/ln]	181.33	280.56	220.04	147.65	66.46	176.95	64.57	176.85	163.42	75.16	327.61	134.37
95th-Percentile Queue Length [veh/ln]	11.67	16.72	13.67	9.89	4.79	11.44	4.65	11.44	10.73	5.41	19.04	9.18
95th-Percentile Queue Length [ft/ln]	291.75	417.91	341.68	247.30	119.63	286.02	116.23	285.90	268.25	135.29	476.02	229.42

Movement, Approach, & Intersection Results

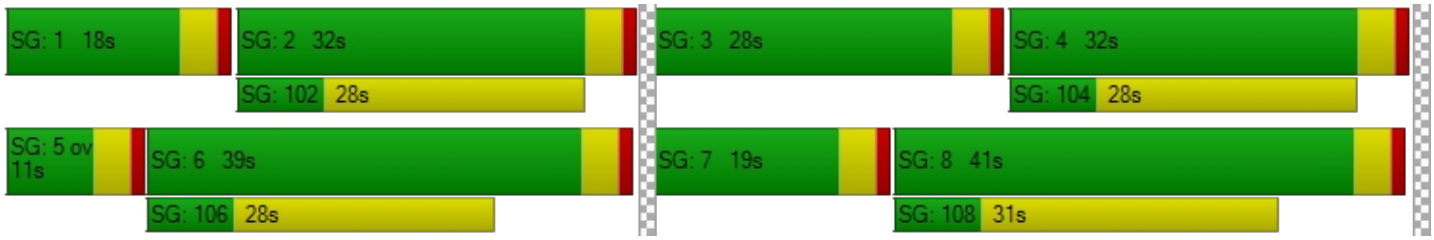
d_M, Delay for Movement [s/veh]	48.32	50.18	42.48	57.05	38.96	34.86	59.48	26.93	26.56	53.85	30.90	23.70
Movement LOS	D	D	D	E	D	C	E	C	C	D	C	C
d_A, Approach Delay [s/veh]	47.50			42.16			33.55			32.61		
Approach LOS	D			D			C			C		
d_I, Intersection Delay [s/veh]	38.52											
Intersection LOS	D											
Intersection V/C	0.818											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	44.58	44.58	44.58	44.58
l_p,int, Pedestrian LOS Score for Intersection	2.755	2.722	2.917	2.977
Crosswalk LOS	C	B	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	672	509	509	636
d_b, Bicycle Delay [s]	24.25	30.59	30.59	25.59
l_b,int, Bicycle LOS Score for Intersection	2.585	2.158	2.252	2.906
Bicycle LOS	B	B	B	C

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 6: Peyton Drive at Woodview Road

Control Type:	All-way stop	Delay (sec / veh):	13.8
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.583

Intersection Setup

Name	Peyton Drive		Woodview Road		Woodview Road	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	1	1	0	1	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	45.00		40.00		35.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

Volumes

Name	Peyton Drive		Woodview Road		Woodview Road	
Base Volume Input [veh/h]	225	48	66	66	39	331
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	225	48	66	66	39	331
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	59	13	17	17	10	87
Total Analysis Volume [veh/h]	237	51	69	69	41	348
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	554	681	517	558	667
Degree of Utilization, x	0.43	0.07	0.13	0.12	0.58

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	2.13	0.24	0.46	0.42	3.79
95th-Percentile Queue Length [ft]	53.22	6.06	11.46	10.53	94.69
Approach Delay [s/veh]	12.99		10.40		15.68
Approach LOS	B		B		C
Intersection Delay [s/veh]	13.83				
Intersection LOS	B				

Intersection Level Of Service Report
Intersection 7: Pipeline Avenue at Woodview Road

Control Type:	Two-way stop	Delay (sec / veh):	89.1
Analysis Method:	HCM 7th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.533

Intersection Setup

Name	Pipeline Avenue		Pipeline Avenue		Woodview Road	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	40.00		30.00		35.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name	Pipeline Avenue		Pipeline Avenue		Woodview Road	
Base Volume Input [veh/h]	335	310	251	37	58	301
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	335	310	251	37	58	301
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	88	82	66	10	15	79
Total Analysis Volume [veh/h]	353	326	264	39	61	317
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.28	0.00	0.00	0.00	0.53	0.42
d_M, Delay for Movement [s/veh]	8.35	0.00	0.00	0.00	89.07	62.38
Movement LOS	A	A	A	A	F	F
95th-Percentile Queue Length [veh/ln]	0.73	0.73	0.00	0.00	10.79	10.79
95th-Percentile Queue Length [ft/ln]	18.22	18.22	0.00	0.00	269.73	269.73
d_A, Approach Delay [s/veh]	4.34		0.00		66.69	
Approach LOS	A		A		F	
d_I, Intersection Delay [s/veh]	20.70					
Intersection LOS	F					

Intersection Level Of Service Report
Intersection 8: Pipeline Avenue at Soquel Canyon Parkway

Control Type:	All-way stop	Delay (sec / veh):	70.3
Analysis Method:	HCM 7th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.102

Intersection Setup

Name	Pipeline Avenue		Soquel Canyon Parkway		Soquel Canyon Parkway	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	1	0	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	40.00		45.00		50.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		No	

Volumes

Name	Pipeline Avenue		Soquel Canyon Parkway		Soquel Canyon Parkway	
Base Volume Input [veh/h]	535	21	30	51	31	576
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	535	21	30	51	31	576
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	141	6	8	13	8	152
Total Analysis Volume [veh/h]	563	22	32	54	33	606
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	585	446	474	474	474	547	547	611
Degree of Utilization, x	1.10	0.07	0.04	0.04	0.04	0.03	0.03	0.99

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	18.57	0.23	0.12	0.12	0.12	0.09	0.09	14.77
95th-Percentile Queue Length [ft]	464.23	5.78	2.95	2.95	2.95	2.33	2.33	369.27
Approach Delay [s/veh]	95.02	10.89				55.59		
Approach LOS	F	B				F		
Intersection Delay [s/veh]	70.27							
Intersection LOS	F							

Intersection Level Of Service Report

Intersection 9: Soquel Canyon Parkway at Los Serranos Country Club Drive/Butterfield Ranch Road

Control Type:	Signalized	Delay (sec / veh):	34.4
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.526

Intersection Setup

Name	Soquel Canyon Parkway			Soquel Canyon Parkway			Lo Se			Butterfield Ranch Road		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	0	1	0	0	1	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Soquel Canyon Parkway			Soquel Canyon Parkway			Lo Se			Butterfield Ranch Road		
Base Volume Input [veh/h]	13	699	124	110	325	253	334	150	20	277	254	501
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	13	699	124	110	325	253	334	150	20	277	254	501
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	184	33	29	86	67	88	39	5	73	67	132
Total Analysis Volume [veh/h]	14	736	131	116	342	266	352	158	21	292	267	527
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Overlap
Signal Group	1	6	0	5	2	0	3	8	0	7	4	4
Auxiliary Signal Groups												4,5
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	6
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	30
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	3.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	1.0
Split [s]	12	39	0	10	37	0	32	39	0	32	39	39
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	3.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	7
Pedestrian Clearance [s]	0	28	0	0	18	0	0	28	0	0	28	28
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	2.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	2.0
Minimum Recall	No	No		No	No		No	No		No	No	No
Maximum Recall	No	No		No	No		No	No		No	No	No
Pedestrian Recall	No	No		No	No		No	No		No	No	No
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	C	L	C	C	L	C	R
C, Cycle Length [s]	120	120	120	120	120	120	120	120	120	120	120	120
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	0.00
g_i, Effective Green Time [s]	2	61	61	6	65	65	16	24	24	13	21	31
g / C, Green / Cycle	0.02	0.51	0.51	0.05	0.54	0.54	0.13	0.20	0.20	0.11	0.18	0.26
(v / s)_i Volume / Saturation Flow Rate	0.01	0.16	0.16	0.04	0.10	0.15	0.11	0.05	0.05	0.09	0.15	0.15
s, saturation flow rate [veh/h]	1700	3600	1800	3200	3600	1800	3200	1800	1800	3200	1800	3600
c, Capacity [veh/h]	33	1822	911	162	1934	967	421	356	356	359	321	945
d1, Uniform Delay [s]	58.18	17.46	17.41	56.13	14.20	15.08	50.88	40.71	40.64	52.06	47.59	38.26
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	8.21	0.46	0.90	5.73	0.20	0.70	4.45	0.38	0.36	4.46	5.58	0.52
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.42	0.32	0.31	0.71	0.18	0.28	0.84	0.26	0.25	0.81	0.83	0.56
d, Delay for Lane Group [s/veh]	66.39	17.92	18.31	61.86	14.40	15.79	55.33	41.08	41.00	56.52	53.17	38.78
Lane Group LOS	E	B	B	E	B	B	E	D	D	E	D	D
Critical Lane Group	No	Yes	No	Yes	No	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.50	4.82	4.83	1.86	2.42	4.10	5.42	2.32	2.25	4.52	8.18	6.77
50th-Percentile Queue Length [ft/ln]	12.42	120.40	120.85	46.53	60.47	102.40	135.44	58.11	56.13	112.90	204.59	169.37
95th-Percentile Queue Length [veh/ln]	0.89	8.42	8.44	3.35	4.35	7.37	9.23	4.18	4.04	8.00	12.88	11.04
95th-Percentile Queue Length [ft/ln]	22.36	210.38	211.00	83.75	108.84	184.33	230.87	104.61	101.03	200.03	321.88	276.08

Movement, Approach, & Intersection Results

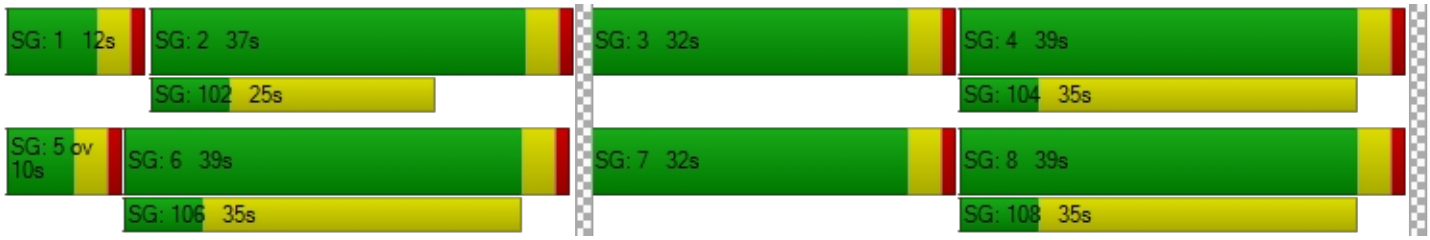
d_M, Delay for Movement [s/veh]	66.39	18.00	18.31	61.86	14.40	15.79	55.33	41.05	41.00	56.52	53.17	38.78
Movement LOS	E	B	B	E	B	B	E	D	D	E	D	D
d_A, Approach Delay [s/veh]	18.82			22.51			50.51			47.09		
Approach LOS	B			C			D			D		
d_I, Intersection Delay [s/veh]	34.40											
Intersection LOS	C											
Intersection V/C	0.526											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	49.52	49.52	49.52	49.52
l_p,int, Pedestrian LOS Score for Intersection	2.822	3.024	2.524	2.921
Crosswalk LOS	C	C	B	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	583	550	583	583
d_b, Bicycle Delay [s]	30.12	31.55	30.12	30.12
l_b,int, Bicycle LOS Score for Intersection	2.044	1.958	1.998	3.352
Bicycle LOS	B	A	A	C

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	

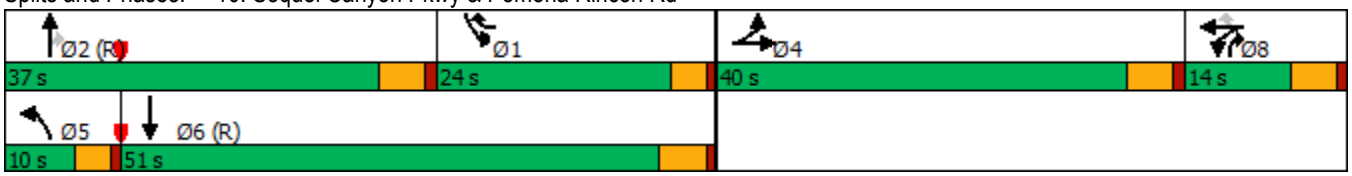


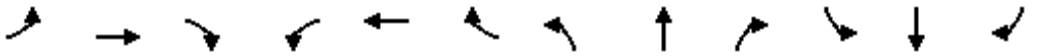
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	32	88	7	152	3	493	32	1230	381	645	546	59
Future Volume (vph)	32	88	7	152	3	493	32	1230	381	645	546	59
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	0.95	0.91	0.95	1.00	0.86	0.86	0.97	0.91	0.91
Frt		0.989			0.861	0.850		0.995	0.850		0.985	
Flt Protected	0.950			0.950	0.997		0.950			0.950		
Satd. Flow (prot)	1770	1842	0	1681	1455	1504	1770	4782	1362	3433	5009	0
Flt Permitted	0.950			0.950	0.997		0.950			0.950		
Satd. Flow (perm)	1770	1842	0	1681	1455	1504	1770	4782	1362	3433	5009	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		4			364	394		4	401		19	
Link Speed (mph)		25			25			50			50	
Link Distance (ft)		560			625			594			526	
Travel Time (s)		15.3			17.0			8.1			7.2	
Peak Hour Factor	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65
Adj. Flow (vph)	49	135	11	234	5	758	49	1892	586	992	840	91
Shared Lane Traffic (%)				10%		48%			10%			
Lane Group Flow (vph)	49	146	0	211	392	394	49	1951	527	992	931	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2	1	1	2	1	1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100		20	100	20	20	100	20	20	100	
Trailing Detector (ft)	0	0		0	0	0	0	0	0	0	0	
Detector 1 Position(ft)	0	0		0	0	0	0	0	0	0	0	
Detector 1 Size(ft)	20	6		20	6	20	20	6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Split	NA		Split	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	
Protected Phases	4	4		8	8	1	5	2	8	1	6	
Permitted Phases						8			2			
Detector Phase	4	4		8	8	1	5	2	8	1	6	
Switch Phase												
Minimum Initial (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Split (s)	40.0	40.0		11.0	11.0	10.0	10.0	30.0	11.0	10.0	23.0	
Total Split (s)	40.0	40.0		14.0	14.0	24.0	10.0	37.0	14.0	24.0	51.0	
Total Split (%)	34.8%	34.8%		12.2%	12.2%	20.9%	8.7%	32.2%	12.2%	20.9%	44.3%	
Maximum Green (s)	35.0	35.0		9.0	9.0	20.0	6.0	32.0	9.0	20.0	46.0	
Yellow Time (s)	4.0	4.0		4.0	4.0	3.0	3.0	4.0	4.0	3.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0	4.0	4.0	5.0	5.0	4.0	5.0	
Lead/Lag						Lag	Lead	Lead		Lag	Lag	
Lead-Lag Optimize?						Yes	Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	None		None	None	None	None	C-Max	None	None	C-Max	
Walk Time (s)	7.0	7.0						7.0			7.0	
Flash Dont Walk (s)	28.0	28.0						18.0			11.0	
Pedestrian Calls (#/hr)	5	5						5			5	
Act Effct Green (s)	17.3	17.3		26.7	26.7	47.7	6.0	32.0	63.7	20.0	48.0	
Actuated g/C Ratio	0.15	0.15		0.23	0.23	0.41	0.05	0.28	0.55	0.17	0.42	
v/c Ratio	0.18	0.52		0.54	0.64	0.46	0.53	1.46	0.56	1.66	0.44	
Control Delay	40.2	48.3		47.3	11.9	3.4	74.2	245.1	7.5	336.7	24.7	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	40.2	48.3		47.3	11.9	3.4	74.2	245.1	7.5	336.7	24.7	
LOS	D	D		D	B	A	E	F	A	F	C	
Approach Delay		46.3			16.0			192.2			185.6	
Approach LOS		D			B			F			F	
Queue Length 50th (ft)	33	101		140	17	0	36	~773	47	~551	179	
Queue Length 95th (ft)	39	92		#256	6	0	55	#518	43	#424	145	
Internal Link Dist (ft)		480			545			514			446	
Turn Bay Length (ft)												
Base Capacity (vph)	538	563		389	616	854	92	1333	933	597	2102	
Starvation Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.09	0.26		0.54	0.64	0.46	0.53	1.46	0.56	1.66	0.44	

Intersection Summary			
Area Type:	Other		
Cycle Length: 115			
Actuated Cycle Length: 115			
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green			
Natural Cycle: 115			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.66			
Intersection Signal Delay: 153.8		Intersection LOS: F	
Intersection Capacity Utilization 75.2%		ICU Level of Service D	
Analysis Period (min) 15			
~ Volume exceeds capacity, queue is theoretically infinite.			
Queue shown is maximum after two cycles.			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 10: Soquel Canyon Pkwy & Pomona Rincon Rd





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	32	88	7	152	3	493	32	1230	381	645	546	59
Future Volume (veh/h)	32	88	7	152	3	493	32	1230	381	645	546	59
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	49	135	11	158	0	843	49	1892	586	992	840	91
Peak Hour Factor	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	183	175	14	139	0	1411	74	1561	565	1268	2867	309
Arrive On Green	0.10	0.10	0.10	0.08	0.00	0.08	0.04	0.28	0.28	0.37	0.61	0.61
Sat Flow, veh/h	1781	1706	139	1781	0	3170	1781	5611	1585	3456	4679	505
Grp Volume(v), veh/h	49	0	146	158	0	843	49	1892	586	992	610	321
Grp Sat Flow(s),veh/h/ln	1781	0	1845	1781	0	1585	1781	1870	1585	1728	1702	1780
Q Serve(g_s), s	2.9	0.0	8.9	9.0	0.0	0.0	3.1	32.0	32.0	29.3	9.7	9.8
Cycle Q Clear(g_c), s	2.9	0.0	8.9	9.0	0.0	0.0	3.1	32.0	32.0	29.3	9.7	9.8
Prop In Lane	1.00		0.08	1.00		1.00	1.00		1.00	1.00		0.28
Lane Grp Cap(c), veh/h	183	0	189	139	0	1411	74	1561	565	1268	2086	1090
V/C Ratio(X)	0.27	0.00	0.77	1.13	0.00	0.60	0.67	1.21	1.04	0.78	0.29	0.29
Avail Cap(c_a), veh/h	542	0	562	139	0	1411	93	1561	565	1268	2086	1090
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	47.6	0.0	50.3	53.0	0.0	24.1	54.3	41.5	34.1	32.3	10.5	10.5
Incr Delay (d2), s/veh	0.8	0.0	6.5	116.5	0.0	0.7	11.7	101.5	47.8	3.2	0.4	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	0.0	4.5	8.6	0.0	8.8	1.6	28.6	23.4	12.0	3.3	3.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	48.4	0.0	56.8	169.5	0.0	24.8	66.1	143.0	81.9	35.6	10.9	11.2
LnGrp LOS	D	A	E	F	A	C	E	F	F	D	B	B
Approach Vol, veh/h		195			1001			2527			1923	
Approach Delay, s/veh		54.7			47.6			127.3			23.7	
Approach LOS		D			D			F			C	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	47.2	37.0		16.8	8.7	75.5		14.0				
Change Period (Y+Rc), s	5.0	* 5		5.0	4.0	5.0		5.0				
Max Green Setting (Gmax), s	20.0	* 32		35.0	6.0	46.0		9.0				
Max Q Clear Time (g_c+I1), s	31.3	34.0		10.9	5.1	11.8		11.0				
Green Ext Time (p_c), s	0.0	0.0		1.0	0.0	6.1		0.0				

Intersection Summary			
HCM 6th Ctrl Delay		75.4	
HCM 6th LOS		E	

Notes

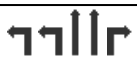
User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection Level Of Service Report
Intersection 11: Peyton Drive at Grand Avenue

Control Type:	Signalized	Delay (sec / veh):	33.8
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.668

Intersection Setup

Name	Peyton Drive			Peyton Drive			Grand Avenue			Grand Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	1	0	0	1	0	1	1	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Peyton Drive			Peyton Drive			Grand Avenue			Grand Avenue		
Base Volume Input [veh/h]	229	639	141	138	749	259	224	505	271	223	738	87
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	229	639	141	138	749	259	224	505	271	223	738	87
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	60	168	37	36	197	68	59	133	71	59	194	23
Total Analysis Volume [veh/h]	241	673	148	145	788	273	236	532	285	235	777	92
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	105
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	1	6	0	5	2	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	14	39	0	10	35	0	13	42	0	14	43	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	28	0	0	24	0	0	31	0	0	28	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	C	L	C	R	L	C	R
C, Cycle Length [s]	105	105	105	105	105	105	105	105	105	105	105	105
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	10	48	48	6	44	44	9	25	25	10	26	26
g / C, Green / Cycle	0.09	0.46	0.46	0.06	0.42	0.42	0.09	0.24	0.24	0.09	0.25	0.25
(v / s)_i Volume / Saturation Flow Rate	0.08	0.12	0.08	0.05	0.20	0.19	0.07	0.15	0.16	0.07	0.22	0.05
s, saturation flow rate [veh/h]	3200	5400	1800	3200	3600	1800	3200	3600	1800	3200	3600	1800
c, Capacity [veh/h]	300	2463	821	186	1513	756	276	870	435	295	891	445
d1, Uniform Delay [s]	46.68	17.77	16.94	48.86	22.13	21.71	47.36	35.47	35.91	46.76	37.97	31.38
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	4.99	0.27	0.48	7.01	1.09	1.88	7.38	0.70	1.68	4.93	2.85	0.23
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.80	0.27	0.18	0.78	0.48	0.44	0.85	0.61	0.66	0.80	0.87	0.21
d, Delay for Lane Group [s/veh]	51.67	18.04	17.43	55.86	23.23	23.58	54.74	36.17	37.59	51.69	40.81	31.60
Lane Group LOS	D	B	B	E	C	C	D	D	D	D	D	C
Critical Lane Group	Yes	No	No	No	Yes	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	3.28	3.38	2.20	2.05	6.60	6.15	3.31	6.09	6.72	3.20	9.81	1.88
50th-Percentile Queue Length [ft/ln]	82.00	84.62	55.01	51.25	165.08	153.87	82.84	152.34	168.05	79.94	245.22	46.97
95th-Percentile Queue Length [veh/ln]	5.90	6.09	3.96	3.69	10.82	10.22	5.96	10.14	10.97	5.76	14.94	3.38
95th-Percentile Queue Length [ft/ln]	147.60	152.31	99.01	92.26	270.43	255.58	149.12	253.55	274.35	143.88	373.62	84.54

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	51.67	18.04	17.43	55.86	23.26	23.58	54.74	36.17	37.59	51.69	40.81	31.60
Movement LOS	D	B	B	E	C	C	D	D	D	D	D	C
d_A, Approach Delay [s/veh]	25.59			27.25			40.72			42.36		
Approach LOS	C			C			D			D		
d_I, Intersection Delay [s/veh]	33.82											
Intersection LOS	C											
Intersection V/C	0.668											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	42.11	42.11	42.11	42.11
l_p,int, Pedestrian LOS Score for Intersection	3.113	3.002	2.928	2.968
Crosswalk LOS	C	C	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	666	590	723	742
d_b, Bicycle Delay [s]	23.36	26.10	21.40	20.77
l_b,int, Bicycle LOS Score for Intersection	2.144	2.223	2.428	2.470
Bicycle LOS	B	B	B	B

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 12: Carbon Canyon Road at Fairway Drive/Ginseng Lane

Control Type:	Two-way stop	Delay (sec / veh):	111.2
Analysis Method:	HCM 7th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.106

Intersection Setup

Name	Carbon Canyon Road			Carbon Canyon Road			Fairway Drive			Ginseng Lane		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	0	0	0	1	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	45.00			45.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			No			No		

Volumes

Name	Carbon Canyon Road			Carbon Canyon Road			Fairway Drive			Ginseng Lane		
Base Volume Input [veh/h]	16	487	0	1	1442	17	4	0	4	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	16	487	0	1	1442	17	4	0	4	0	0	0
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	4	128	0	0	379	4	1	0	1	0	0	0
Total Analysis Volume [veh/h]	17	513	0	1	1518	18	4	0	4	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Free	Free	Stop	Stop
Flared Lane				No
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance			No	No
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.04	0.01	0.00	0.00	0.02	0.00	0.11	0.00	0.03	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	13.66	0.00	0.00	8.42	0.00	0.00	111.24	85.93	30.62	103.29	75.87	11.41
Movement LOS	B	A	A	A	A	A	F	F	D	F	F	B
95th-Percentile Queue Length [veh/ln]	0.12	0.00	0.00	0.00	0.00	0.00	0.33	0.33	0.08	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	3.06	0.00	0.00	0.07	0.00	0.00	8.24	8.24	2.12	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	0.44			0.01			70.93			63.53		
Approach LOS	A			A			F			F		
d_I, Intersection Delay [s/veh]	0.39											
Intersection LOS	F											

Intersection Level Of Service Report
Intersection 13: Carbon Canyon Road at Canyon Hills Road

Control Type:	Two-way stop	Delay (sec / veh):	215.5
Analysis Method:	HCM 7th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.771

Intersection Setup

Name	Carbon Canyon Road		Carbon Canyon Road		Canyon Hills Road	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	45.00		45.00		25.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name	Carbon Canyon Road		Carbon Canyon Road		Canyon Hills Road	
Base Volume Input [veh/h]	16	368	1406	30	52	47
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	16	368	1406	30	52	47
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	4	97	370	8	14	12
Total Analysis Volume [veh/h]	17	387	1480	32	55	49
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.04	0.00	0.01	0.00	0.77	0.32
d_M, Delay for Movement [s/veh]	13.47	0.00	0.00	0.00	215.51	188.92
Movement LOS	B	A	A	A	F	F
95th-Percentile Queue Length [veh/ln]	0.12	0.00	0.00	0.00	6.84	6.84
95th-Percentile Queue Length [ft/ln]	2.99	0.00	0.00	0.00	170.99	170.99
d_A, Approach Delay [s/veh]	0.57		0.00		202.98	
Approach LOS	A		A		F	
d_I, Intersection Delay [s/veh]	10.56					
Intersection LOS	F					

Intersection Level Of Service Report
Intersection 1: Peyton Drive at Chino Avenue

Control Type:	Signalized	Delay (sec / veh):	32.8
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.648

Intersection Setup

Name	Peyton Drive			Peyton Drive			Chino Avenue			Chino Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	0	1	0	0	1	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Peyton Drive			Peyton Drive			Chino Avenue			Chino Avenue		
Base Volume Input [veh/h]	133	725	202	375	929	168	104	199	139	152	157	311
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	133	725	202	375	929	168	104	199	139	152	157	311
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	35	191	53	99	244	44	27	52	37	40	41	82
Total Analysis Volume [veh/h]	140	763	213	395	978	177	109	209	146	160	165	327
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	1	6	0	5	2	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	10	35	0	20	45	0	12	39	0	16	43	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	24	0	0	24	0	0	28	0	0	28	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	C	L	C	C	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	6	48	48	15	57	57	8	19	19	12	23	23
g / C, Green / Cycle	0.05	0.44	0.44	0.14	0.52	0.52	0.07	0.17	0.17	0.11	0.21	0.21
(v / s)_i Volume / Saturation Flow Rate	0.04	0.18	0.17	0.12	0.22	0.21	0.06	0.06	0.08	0.09	0.05	0.18
s, saturation flow rate [veh/h]	3200	3600	1800	3200	3600	1800	1700	3600	1800	1700	3600	1800
c, Capacity [veh/h]	177	1565	782	451	1872	936	125	611	305	186	741	370
d1, Uniform Delay [s]	51.37	21.57	21.30	46.36	16.17	16.04	50.50	40.30	41.31	48.18	36.39	42.43
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	7.66	0.84	1.52	5.57	0.68	1.29	16.60	0.33	1.16	10.82	0.15	6.97
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.79	0.42	0.40	0.88	0.42	0.40	0.87	0.34	0.48	0.86	0.22	0.88
d, Delay for Lane Group [s/veh]	59.03	22.42	22.82	51.94	16.86	17.34	67.10	40.63	42.47	59.00	36.54	49.40
Lane Group LOS	E	C	C	D	B	B	E	D	D	E	D	D
Critical Lane Group	No	Yes	No	Yes	No	No	Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	2.09	6.03	5.77	5.62	6.01	5.95	3.54	2.53	3.68	4.86	1.87	9.27
50th-Percentile Queue Length [ft/ln]	52.30	150.65	144.33	140.47	150.23	148.74	88.50	63.13	91.88	121.49	46.65	231.73
95th-Percentile Queue Length [veh/ln]	3.77	10.05	9.71	9.51	10.03	9.95	6.37	4.55	6.62	8.48	3.36	14.26
95th-Percentile Queue Length [ft/ln]	94.15	251.30	242.85	237.66	250.73	248.75	159.30	113.64	165.38	211.88	83.96	356.56

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	59.03	22.47	22.82	51.94	16.95	17.34	67.10	40.63	42.47	59.00	36.54	49.40
Movement LOS	E	C	C	D	B	B	E	D	D	E	D	D
d_A, Approach Delay [s/veh]	27.12			25.91			47.43			48.50		
Approach LOS	C			C			D			D		
d_I, Intersection Delay [s/veh]	32.80											
Intersection LOS	C											
Intersection V/C	0.648											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	44.58	44.58	44.58	44.58
l_p,int, Pedestrian LOS Score for Intersection	3.028	3.070	2.735	2.808
Crosswalk LOS	C	C	B	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	563	745	636	709
d_b, Bicycle Delay [s]	28.39	21.66	25.59	22.94
l_b,int, Bicycle LOS Score for Intersection	2.173	2.412	1.815	2.098
Bicycle LOS	B	B	A	B

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 2: Gateway Village/Boys Republic Drive at Grand Avenue

Control Type:	Signalized	Delay (sec / veh):	148.3
Analysis Method:	HCM 7th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.313

Intersection Setup

Name	Boys Republic Drive			Gateway Village			Grand Avenue			Grand Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	1	1	0	0	1	0	0	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			No		

Volumes

Name	Boys Republic Drive			Gateway Village			Grand Avenue			Grand Avenue		
Base Volume Input [veh/h]	13	34	607	276	54	73	115	1186	25	669	1201	133
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	13	34	607	276	54	73	115	1186	25	669	1201	133
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	9	160	73	14	19	30	312	7	176	316	35
Total Analysis Volume [veh/h]	14	36	639	291	57	77	121	1248	26	704	1264	140
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Split	Split	Split	Split	Split	Split	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	0	8	0	0	4	0	5	2	0	1	6	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	0	6	0	0	6	0	6	6	0	6	6	0
Maximum Green [s]	0	30	0	0	30	0	30	30	0	30	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	21	0	0	35	0	14	25	0	39	50	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	0	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	24	0	0	14	0	0	11	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall		No			No		No	No		No	No	
Maximum Recall		No			No		No	No		No	No	
Pedestrian Recall		No			No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	R	L	C	L	C	C	L	C	C
C, Cycle Length [s]	120	120	120	120	120	120	120	120	120	120
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	30	30	18	18	10	21	21	35	46	46
g / C, Green / Cycle	0.25	0.25	0.15	0.15	0.08	0.18	0.18	0.29	0.38	0.38
(v / s)_i Volume / Saturation Flow Rate	0.03	0.36	0.13	0.12	0.07	0.23	0.24	0.41	0.26	0.26
s, saturation flow rate [veh/h]	1700	1800	1700	1700	1700	3600	1800	1700	3600	1800
c, Capacity [veh/h]	426	452	252	252	142	634	317	496	1383	692
d1, Uniform Delay [s]	34.70	44.96	49.88	49.67	54.27	49.43	49.43	42.51	30.71	30.80
k, delay calibration	0.11	0.50	0.11	0.11	0.11	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.12	199.59	8.21	6.98	13.21	155.57	186.98	200.67	2.65	5.34
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.12	1.42	0.86	0.83	0.85	1.32	1.37	1.42	0.67	0.68
d, Delay for Lane Group [s/veh]	34.82	244.55	58.10	56.64	67.48	205.01	236.41	243.18	33.36	36.13
Lane Group LOS	C	F	E	E	E	F	F	F	C	D
Critical Lane Group	No	Yes	Yes	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	1.15	38.33	6.88	6.58	4.13	23.17	25.94	42.14	11.64	12.27
50th-Percentile Queue Length [ft/ln]	28.78	958.36	171.98	164.43	103.14	579.36	648.53	1053.40	290.88	306.76
95th-Percentile Queue Length [veh/ln]	2.07	57.75	11.18	10.78	7.43	35.25	39.49	63.56	17.23	18.02
95th-Percentile Queue Length [ft/ln]	51.81	1443.82	279.51	269.58	185.66	881.34	987.30	1588.96	430.73	450.38

Movement, Approach, & Intersection Results

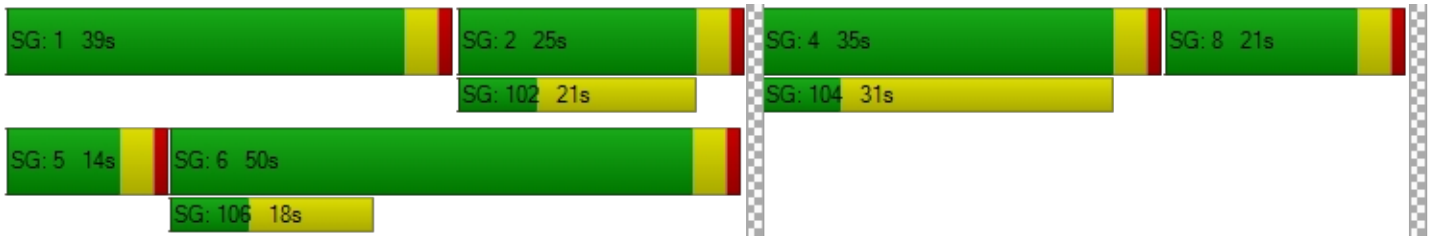
d_M, Delay for Movement [s/veh]	34.82	34.82	244.55	57.71	56.64	56.64	67.48	215.32	236.41	243.18	34.09	36.13
Movement LOS	C	C	F	E	E	E	E	F	F	F	C	D
d_A, Approach Delay [s/veh]	229.33			57.38			202.89			104.06		
Approach LOS	F			E			F			F		
d_I, Intersection Delay [s/veh]	148.31											
Intersection LOS	F											
Intersection V/C	1.313											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	0.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	49.51	49.51	49.51	0.00
l_p,int, Pedestrian LOS Score for Intersection	2.505	2.189	2.991	0.000
Crosswalk LOS	B	B	C	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	283	517	350	767
d_b, Bicycle Delay [s]	44.21	33.01	40.84	22.82
l_b,int, Bicycle LOS Score for Intersection	2.696	2.261	2.327	2.719
Bicycle LOS	B	B	B	B

Sequence

Ring 1	1	2	4	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 3: Peyton Drive at Eucalyptus Avenue

Control Type:	Signalized	Delay (sec / veh):	21.2
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.520

Intersection Setup

Name	Peyton Drive			Peyton Drive			Eucalyptus Avenue			Eucalyptus Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	1	1	0	0	1	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Peyton Drive			Peyton Drive			Eucalyptus Avenue			Eucalyptus Avenue		
Base Volume Input [veh/h]	37	493	190	228	657	328	216	280	19	181	268	220
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	37	493	190	228	657	328	216	280	19	181	268	220
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	10	130	50	60	173	86	57	74	5	48	71	58
Total Analysis Volume [veh/h]	39	519	200	240	692	345	227	295	20	191	282	232
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal Group	1	6	0	5	2	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	6	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	10	29	0	10	29	0	16	41	0	10	35	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	18	0	0	14	0	0	21	0	0	24	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		Yes	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	R	L	C	C	L	C	R
C, Cycle Length [s]	90	90	90	90	90	90	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	0.00	0.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	53	43	43	53	46	46	29	29	19	29	18	18
g / C, Green / Cycle	0.59	0.48	0.48	0.59	0.51	0.51	0.32	0.32	0.21	0.32	0.20	0.20
(v / s)_i Volume / Saturation Flow Rate	0.02	0.14	0.13	0.14	0.19	0.19	0.07	0.07	0.18	0.11	0.16	0.13
s, saturation flow rate [veh/h]	1700	3600	1800	1700	3600	1800	1700	1700	1800	1700	1800	1800
c, Capacity [veh/h]	909	1731	866	975	1820	910	418	549	372	261	362	362
d1, Uniform Delay [s]	7.65	14.06	13.93	8.71	13.65	13.64	22.44	22.44	34.41	23.59	34.12	33.03
k, delay calibration	0.11	0.50	0.50	0.50	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.02	0.41	0.75	0.60	0.61	1.20	0.35	0.18	5.38	3.96	3.65	1.89
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.04	0.28	0.27	0.25	0.38	0.38	0.27	0.21	0.85	0.73	0.78	0.64
d, Delay for Lane Group [s/veh]	7.67	14.47	14.68	9.31	14.25	14.84	22.79	22.63	39.79	27.56	37.77	34.93
Lane Group LOS	A	B	B	A	B	B	C	C	D	C	D	C
Critical Lane Group	No	Yes	No	Yes	No	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	0.30	2.95	2.83	2.20	4.20	4.34	1.77	1.75	7.04	3.34	6.10	4.75
50th-Percentile Queue Length [ft/ln]	7.39	73.75	70.85	54.96	105.04	108.45	44.17	43.86	176.03	83.54	152.43	118.85
95th-Percentile Queue Length [veh/ln]	0.53	5.31	5.10	3.96	7.56	7.75	3.18	3.16	11.39	6.01	10.15	8.33
95th-Percentile Queue Length [ft/ln]	13.30	132.75	127.54	98.93	189.07	193.84	79.50	78.96	284.83	150.36	253.67	208.25

Movement, Approach, & Intersection Results

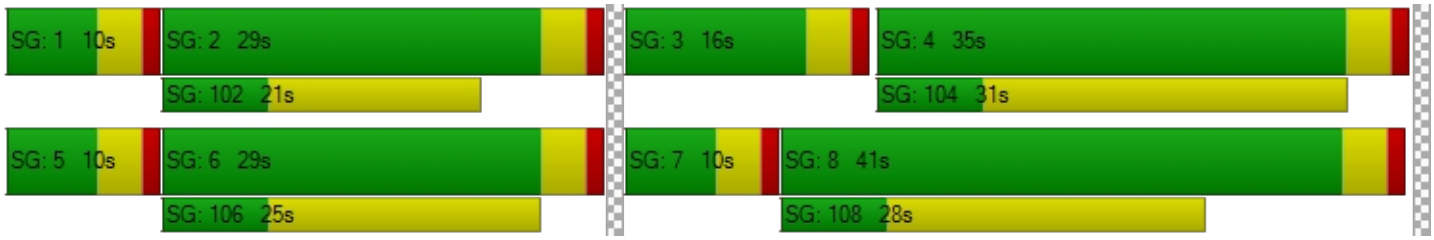
d_M, Delay for Movement [s/veh]	7.67	14.48	14.68	9.31	14.25	14.84	22.75	39.79	39.79	27.56	37.77	34.93
Movement LOS	A	B	B	A	B	B	C	D	D	C	D	C
d_A, Approach Delay [s/veh]	14.18			13.48			32.63			34.07		
Approach LOS	B			B			C			C		
d_I, Intersection Delay [s/veh]	21.23											
Intersection LOS	C											
Intersection V/C	0.520											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	34.72	34.72	34.72	34.72
l_p,int, Pedestrian LOS Score for Intersection	2.994	3.105	2.454	2.752
Crosswalk LOS	C	C	B	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	555	555	821	688
d_b, Bicycle Delay [s]	23.51	23.51	15.64	19.38
l_b,int, Bicycle LOS Score for Intersection	1.977	2.613	2.007	2.723
Bicycle LOS	A	B	B	B

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 4: Rustic Drive/Carbon Canyon Road at Chino Hills Parkway

Control Type:	Signalized	Delay (sec / veh):	40.9
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.912

Intersection Setup

Name	Carbon Canyon Road			Rustic Drive			Chino Hills Parkway			Chino Hills Parkway		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	1	0	0	1	0	1	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			No		

Volumes

Name	Carbon Canyon Road			Rustic Drive			Chino Hills Parkway			Chino Hills Parkway		
Base Volume Input [veh/h]	266	1	1405	17	1	1	11	782	192	526	753	16
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	266	1	1405	17	1	1	11	782	192	526	753	16
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	70	0	370	4	0	0	3	206	51	138	198	4
Total Analysis Volume [veh/h]	280	1	1479	18	1	1	12	823	202	554	793	17
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	0	8	0	0	4	0	5	2	0	1	6	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	0	6	0	0	6	0	6	6	0	6	6	0
Maximum Green [s]	0	30	0	0	30	0	30	30	0	30	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	55	0	0	55	0	10	30	0	25	45	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	0	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	21	0	0	18	0	0	11	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall		No			No		No	No		No	No	
Maximum Recall		No			No		No	No		No	No	
Pedestrian Recall		No			No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	L	C	R	L	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	48	48	48	48	48	2	29	29	21	48	48
g / C, Green / Cycle	0.44	0.44	0.44	0.44	0.44	0.02	0.26	0.26	0.19	0.44	0.44
(v / s)_i Volume / Saturation Flow Rate	0.16	0.41	0.41	0.01	0.00	0.01	0.23	0.11	0.17	0.23	0.22
s, saturation flow rate [veh/h]	1700	1800	1800	1700	1800	1700	3600	1800	3200	1800	1800
c, Capacity [veh/h]	775	789	789	109	789	30	949	475	604	782	782
d1, Uniform Delay [s]	20.75	29.44	29.44	17.52	17.36	53.43	38.64	33.58	43.77	22.70	22.65
k, delay calibration	0.11	0.38	0.38	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.28	16.57	16.57	0.70	0.00	8.29	10.50	2.78	6.15	2.46	2.43
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.36	0.94	0.94	0.16	0.00	0.40	0.87	0.43	0.92	0.52	0.52
d, Delay for Lane Group [s/veh]	21.04	46.01	46.01	18.22	17.36	61.72	49.15	36.35	49.93	25.15	25.08
Lane Group LOS	C	D	D	B	B	E	D	D	D	C	C
Critical Lane Group	No	Yes	No	No	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	4.84	21.56	21.56	0.28	0.03	0.40	11.85	4.83	7.85	8.08	8.01
50th-Percentile Queue Length [ft/ln]	121.09	539.05	539.05	7.02	0.72	9.94	296.20	120.73	196.33	201.91	200.24
95th-Percentile Queue Length [veh/ln]	8.45	29.18	29.18	0.51	0.05	0.72	17.49	8.43	12.45	12.74	12.65
95th-Percentile Queue Length [ft/ln]	211.32	729.43	729.43	12.64	1.30	17.88	437.32	210.83	311.23	318.43	316.27

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	21.04	46.01	46.01	18.22	17.36	17.36	61.72	49.15	36.35	49.93	25.12	25.08
Movement LOS	C	D	D	B	B	B	E	D	D	D	C	C
d_A, Approach Delay [s/veh]	42.04			18.14			46.80			35.19		
Approach LOS	D			B			D			D		
d_I, Intersection Delay [s/veh]	40.87											
Intersection LOS	D											
Intersection V/C	0.912											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	0.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	44.54	44.54	44.54	0.00
l_p,int, Pedestrian LOS Score for Intersection	2.800	1.966	3.204	0.000
Crosswalk LOS	C	A	C	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	927	927	473	746
d_b, Bicycle Delay [s]	15.82	15.82	32.07	21.63
l_b,int, Bicycle LOS Score for Intersection	4.464	1.593	2.415	2.685
Bicycle LOS	E	A	B	B

Sequence

Ring 1	1	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 5: Peyton Drive at Chino Hills Parkway

Control Type:	Signalized	Delay (sec / veh):	84.9
Analysis Method:	HCM 7th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.139

Intersection Setup

Name	Peyton Drive			Peyton Drive			Chino Hills Parkway			Chino Hills Parkway		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	1	1	0	0	1	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Peyton Drive			Peyton Drive			Chino Hills Parkway			Chino Hills Parkway		
Base Volume Input [veh/h]	169	286	203	380	427	165	355	1322	432	261	932	332
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	169	286	203	380	427	165	355	1322	432	261	932	332
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	44	75	53	100	112	43	93	348	114	69	245	87
Total Analysis Volume [veh/h]	178	301	214	400	449	174	374	1392	455	275	981	349
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Overlap	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	3	8	0	7	4	4	5	2	0	1	6	0
Auxiliary Signal Groups						4,5						
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	6	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	30	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	1.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	28	35	0	25	32	32	19	48	0	12	41	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	7	0	7	0	0	7	0
Pedestrian Clearance [s]	0	24	0	0	21	21	0	21	0	0	21	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No	No	No	No		No	No	
Maximum Recall	No	No		No	No	No	No	No		No	No	
Pedestrian Recall	No	No		No	No	No	No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	R	L	C	C	L	C	R
C, Cycle Length [s]	120	120	120	120	120	120	120	120	120	120	120	120
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	9	21	21	21	33	52	15	54	54	8	47	47
g / C, Green / Cycle	0.07	0.17	0.17	0.18	0.27	0.43	0.13	0.45	0.45	0.07	0.39	0.39
(v / s)_i Volume / Saturation Flow Rate	0.06	0.15	0.13	0.24	0.12	0.10	0.12	0.51	0.51	0.09	0.27	0.19
s, saturation flow rate [veh/h]	3200	1800	1800	1700	3600	1800	3200	1800	1800	3200	3600	1800
c, Capacity [veh/h]	240	314	314	298	989	780	401	809	809	216	1410	705
d1, Uniform Delay [s]	54.41	48.28	47.21	49.51	36.07	21.32	51.99	33.04	33.04	55.99	30.54	27.56
k, delay calibration	0.11	0.15	0.11	0.41	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	4.52	10.33	3.88	171.71	0.33	0.14	9.99	78.03	78.03	132.06	2.86	2.48
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.74	0.87	0.76	1.34	0.45	0.22	0.93	1.14	1.14	1.28	0.70	0.50
d, Delay for Lane Group [s/veh]	58.93	58.61	51.09	221.22	36.39	21.46	61.99	111.07	111.07	188.05	33.40	30.04
Lane Group LOS	E	E	D	F	D	C	E	F	F	F	C	C
Critical Lane Group	No	Yes	No	Yes	No	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	2.79	8.89	7.17	23.10	5.51	3.11	6.12	40.26	40.26	7.21	12.28	8.01
50th-Percentile Queue Length [ft/ln]	69.66	222.37	179.23	577.41	137.65	77.85	153.06	1006.62	1006.62	180.34	307.06	200.31
95th-Percentile Queue Length [veh/ln]	5.02	13.79	11.56	35.34	9.35	5.61	10.18	55.81	55.81	12.47	18.03	12.65
95th-Percentile Queue Length [ft/ln]	125.39	344.65	289.01	883.43	233.86	140.14	254.51	1395.13	1395.13	311.65	450.75	316.36

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	58.93	57.96	51.09	221.22	36.39	21.46	61.99	111.07	111.07	188.05	33.40	30.04
Movement LOS	E	E	D	F	D	C	E	F	F	F	C	C
d_A, Approach Delay [s/veh]	56.09			106.12			102.80			59.17		
Approach LOS	E			F			F			E		
d_I, Intersection Delay [s/veh]	84.94											
Intersection LOS	F											
Intersection V/C	1.139											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	49.52	49.52	49.52	49.52
l_p,int, Pedestrian LOS Score for Intersection	2.771	2.799	3.044	3.111
Crosswalk LOS	C	C	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	517	467	733	617
d_b, Bicycle Delay [s]	33.02	35.28	24.08	28.72
l_b,int, Bicycle LOS Score for Intersection	2.131	2.404	3.392	2.884
Bicycle LOS	B	B	C	C

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 6: Peyton Drive at Woodview Road

Control Type:	All-way stop	Delay (sec / veh):	10.8
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.387

Intersection Setup

Name	Peyton Drive		Woodview Road		Woodview Road	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	1	1	0	1	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	45.00		40.00		35.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

Volumes

Name	Peyton Drive		Woodview Road		Woodview Road	
Base Volume Input [veh/h]	225	68	42	42	72	136
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	225	68	42	42	72	136
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	59	18	11	11	19	36
Total Analysis Volume [veh/h]	237	72	44	44	76	143
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	612	770	554	601	675
Degree of Utilization, x	0.39	0.09	0.08	0.07	0.32

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	1.82	0.31	0.26	0.24	1.41
95th-Percentile Queue Length [ft]	45.60	7.71	6.44	5.90	35.15
Approach Delay [s/veh]	11.22		9.46		10.87
Approach LOS	B		A		B
Intersection Delay [s/veh]	10.85				
Intersection LOS	B				

Intersection Level Of Service Report
Intersection 7: Pipeline Avenue at Woodview Road

Control Type:	Two-way stop	Delay (sec / veh):	38.2
Analysis Method:	HCM 7th Edition	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.288

Intersection Setup

Name	Pipeline Avenue		Pipeline Avenue		Woodview Road	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	40.00		30.00		35.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name	Pipeline Avenue		Pipeline Avenue		Woodview Road	
Base Volume Input [veh/h]	198	265	326	68	52	241
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	198	265	326	68	52	241
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	52	70	86	18	14	63
Total Analysis Volume [veh/h]	208	279	343	72	55	254
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.18	0.00	0.00	0.00	0.29	0.38
d_M, Delay for Movement [s/veh]	8.41	0.00	0.00	0.00	38.15	24.70
Movement LOS	A	A	A	A	E	C
95th-Percentile Queue Length [veh/ln]	0.39	0.39	0.00	0.00	4.83	4.83
95th-Percentile Queue Length [ft/ln]	9.78	9.78	0.00	0.00	120.68	120.68
d_A, Approach Delay [s/veh]	3.59		0.00		27.09	
Approach LOS	A		A		D	
d_I, Intersection Delay [s/veh]	8.36					
Intersection LOS	E					

Intersection Level Of Service Report
Intersection 8: Pipeline Avenue at Soquel Canyon Parkway

Control Type:	All-way stop	Delay (sec / veh):	42.1
Analysis Method:	HCM 7th Edition	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.994

Intersection Setup

Name	Pipeline Avenue		Soquel Canyon Parkway		Soquel Canyon Parkway	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	1	0	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	40.00		45.00		50.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		No	

Volumes

Name	Pipeline Avenue		Soquel Canyon Parkway		Soquel Canyon Parkway	
Base Volume Input [veh/h]	521	26	17	36	40	462
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	521	26	17	36	40	462
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	137	7	4	9	11	122
Total Analysis Volume [veh/h]	548	27	18	38	42	486
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	579	460	491	491	491	552	552	617
Degree of Utilization, x	0.99	0.04	0.03	0.03	0.03	0.04	0.04	0.79

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	14.47	0.12	0.08	0.08	0.08	0.12	0.12	7.58
95th-Percentile Queue Length [ft]	361.65	3.05	1.98	1.98	1.98	2.96	2.96	189.43
Approach Delay [s/veh]	60.63	10.43				25.25		
Approach LOS	F	B				D		
Intersection Delay [s/veh]	42.08							
Intersection LOS	E							

Intersection Level Of Service Report

Intersection 9: Soquel Canyon Parkway at Los Serranos Country Club Drive/Butterfield Ranch Road

Control Type:	Signalized	Delay (sec / veh):	35.7
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.543

Intersection Setup

Name	Soquel Canyon Parkway			Soquel Canyon Parkway			Lo Se			Butterfield Ranch Road		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	0	1	0	0	1	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Soquel Canyon Parkway			Soquel Canyon Parkway			Lo Se			Butterfield Ranch Road		
Base Volume Input [veh/h]	38	429	145	367	713	250	407	271	41	203	176	317
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	38	429	145	367	713	250	407	271	41	203	176	317
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	10	113	38	97	188	66	107	71	11	53	46	83
Total Analysis Volume [veh/h]	40	452	153	386	751	263	428	285	43	214	185	334
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Overlap
Signal Group	1	6	0	5	2	0	3	8	0	7	4	4
Auxiliary Signal Groups												4,5
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	6
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	30
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	3.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	1.0
Split [s]	29	39	0	20	30	0	22	39	0	22	39	39
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	3.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	7
Pedestrian Clearance [s]	0	28	0	0	18	0	0	28	0	0	28	28
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	2.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	2.0
Minimum Recall	No	No		No	No		No	No		No	No	No
Maximum Recall	No	No		No	No		No	No		No	No	No
Pedestrian Recall	No	No		No	No		No	No		No	No	No
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	C	L	C	C	L	C	R
C, Cycle Length [s]	120	120	120	120	120	120	120	120	120	120	120	120
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	0.00
g_i, Effective Green Time [s]	4	55	55	16	66	66	18	23	23	10	15	35
g / C, Green / Cycle	0.04	0.46	0.46	0.13	0.55	0.55	0.15	0.19	0.19	0.09	0.13	0.29
(v / s)_i Volume / Saturation Flow Rate	0.02	0.11	0.11	0.12	0.19	0.18	0.13	0.09	0.09	0.07	0.10	0.09
s, saturation flow rate [veh/h]	1700	3600	1800	3200	3600	1800	3200	1800	1800	3200	1800	3600
c, Capacity [veh/h]	64	1644	822	428	1990	995	476	343	343	274	230	1060
d1, Uniform Delay [s]	56.93	19.99	19.89	51.23	14.89	14.60	50.20	43.35	43.16	53.79	50.93	32.93
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	9.54	0.36	0.69	7.20	0.49	0.85	6.35	1.08	0.99	4.82	6.55	0.17
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.62	0.25	0.24	0.90	0.35	0.32	0.90	0.49	0.47	0.78	0.81	0.31
d, Delay for Lane Group [s/veh]	66.47	20.36	20.58	58.43	15.37	15.45	56.55	44.43	44.15	58.60	57.48	33.10
Lane Group LOS	E	C	C	E	B	B	E	D	D	E	E	C
Critical Lane Group	No	Yes	No	Yes	No	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	1.37	3.59	3.51	6.14	5.31	4.89	6.72	4.56	4.34	3.35	5.82	3.83
50th-Percentile Queue Length [ft/ln]	34.17	89.79	87.64	153.38	132.64	122.15	167.99	113.92	108.46	83.74	145.55	95.65
95th-Percentile Queue Length [veh/ln]	2.46	6.46	6.31	10.20	9.08	8.51	10.97	8.06	7.75	6.03	9.78	6.89
95th-Percentile Queue Length [ft/ln]	61.50	161.62	157.75	254.94	227.08	212.78	274.28	201.45	193.86	150.73	244.48	172.16

Movement, Approach, & Intersection Results

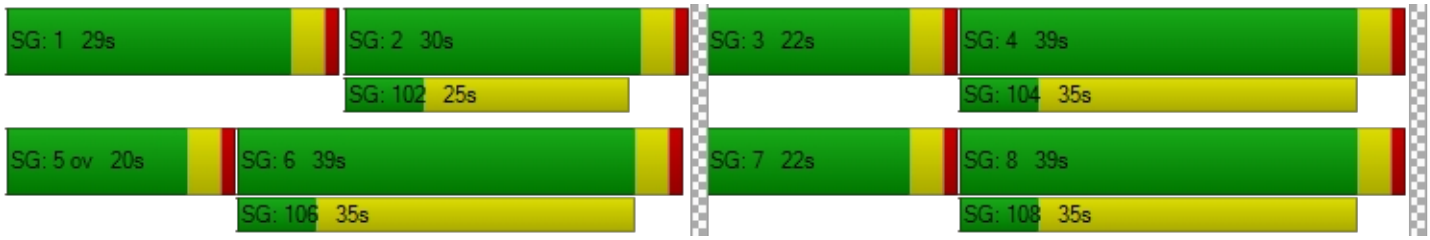
d_M, Delay for Movement [s/veh]	66.47	20.38	20.58	58.43	15.38	15.45	56.55	44.31	44.15	58.60	57.48	33.10
Movement LOS	E	C	C	E	B	B	E	D	D	E	E	C
d_A, Approach Delay [s/veh]	23.28			27.26			51.23			46.70		
Approach LOS	C			C			D			D		
d_I, Intersection Delay [s/veh]	35.69											
Intersection LOS	D											
Intersection V/C	0.543											

Other Modes

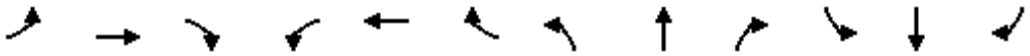
g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	49.52	49.52	49.52	49.52
l_p,int, Pedestrian LOS Score for Intersection	2.838	3.058	2.556	2.929
Crosswalk LOS	C	C	B	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	583	433	583	583
d_b, Bicycle Delay [s]	30.12	36.83	30.12	30.12
l_b,int, Bicycle LOS Score for Intersection	1.914	2.330	2.183	2.769
Bicycle LOS	A	B	B	C

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



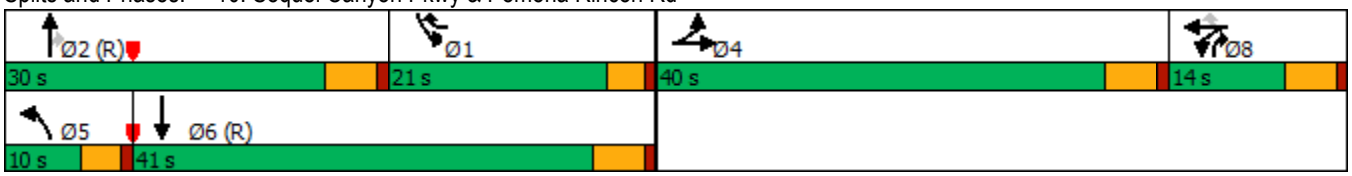
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	69	30	11	168	4	467	32	870	279	714	1131	69
Future Volume (vph)	69	30	11	168	4	467	32	870	279	714	1131	69
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	0.95	0.91	0.95	1.00	0.86	0.86	0.97	0.91	0.91
Frt		0.960			0.863	0.850		0.995	0.850		0.991	
Flt Protected	0.950			0.950	0.997		0.950			0.950		
Satd. Flow (prot)	1770	1788	0	1681	1458	1504	1770	4782	1362	3433	5040	0
Flt Permitted	0.950			0.950	0.997		0.950			0.950		
Satd. Flow (perm)	1770	1788	0	1681	1458	1504	1770	4782	1362	3433	5040	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		12			249	270		4	279		10	
Link Speed (mph)		25			25			50			50	
Link Distance (ft)		560			625			594			526	
Travel Time (s)		15.3			17.0			8.1			7.2	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	77	33	12	187	4	519	36	967	310	793	1257	77
Shared Lane Traffic (%)				10%		48%			10%			
Lane Group Flow (vph)	77	45	0	168	272	270	36	998	279	793	1334	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2	1	1	2	1	1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100		20	100	20	20	100	20	20	100	
Trailing Detector (ft)	0	0		0	0	0	0	0	0	0	0	
Detector 1 Position(ft)	0	0		0	0	0	0	0	0	0	0	
Detector 1 Size(ft)	20	6		20	6	20	20	6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Split	NA		Split	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	
Protected Phases	4	4		8	8	1	5	2	8	1	6	
Permitted Phases						8			2			
Detector Phase	4	4		8	8	1	5	2	8	1	6	
Switch Phase												
Minimum Initial (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	

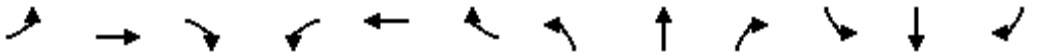


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Split (s)	40.0	40.0		11.0	11.0	10.0	10.0	30.0	11.0	10.0	23.0	
Total Split (s)	40.0	40.0		14.0	14.0	21.0	10.0	30.0	14.0	21.0	41.0	
Total Split (%)	38.1%	38.1%		13.3%	13.3%	20.0%	9.5%	28.6%	13.3%	20.0%	39.0%	
Maximum Green (s)	35.0	35.0		9.0	9.0	17.0	6.0	25.0	9.0	17.0	36.0	
Yellow Time (s)	4.0	4.0		4.0	4.0	3.0	3.0	4.0	4.0	3.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0	4.0	4.0	5.0	5.0	4.0	5.0	
Lead/Lag						Lag	Lead	Lead		Lag	Lag	
Lead-Lag Optimize?						Yes	Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	None		None	None	None	None	C-Max	None	None	C-Max	
Walk Time (s)	7.0	7.0						7.0			7.0	
Flash Dont Walk (s)	28.0	28.0						18.0			11.0	
Pedestrian Calls (#/hr)	5	5						5			5	
Act Effct Green (s)	14.2	14.2		19.3	19.3	38.1	6.9	37.7	62.0	17.0	51.9	
Actuated g/C Ratio	0.14	0.14		0.18	0.18	0.36	0.07	0.36	0.59	0.16	0.49	
v/c Ratio	0.32	0.18		0.54	0.58	0.38	0.31	0.58	0.30	1.43	0.53	
Control Delay	41.2	29.1		48.4	13.1	3.4	54.0	30.8	3.3	237.4	21.9	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	41.2	29.1		48.4	13.1	3.4	54.0	30.8	3.3	237.4	21.9	
LOS	D	C		D	B	A	D	C	A	F	C	
Approach Delay		36.7			17.8			25.6			102.2	
Approach LOS		D			B			C			F	
Queue Length 50th (ft)	50	21		105	14	0	23	209	0	~372	239	
Queue Length 95th (ft)	71	41		#283	#145	34	58	#326	61	#492	345	
Internal Link Dist (ft)		480			545			514			446	
Turn Bay Length (ft)												
Base Capacity (vph)	590	604		309	471	718	116	1720	918	555	2496	
Starvation Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.13	0.07		0.54	0.58	0.38	0.31	0.58	0.30	1.43	0.53	

Intersection Summary			
Area Type:	Other		
Cycle Length: 105			
Actuated Cycle Length: 105			
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green			
Natural Cycle: 115			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.43			
Intersection Signal Delay: 62.8		Intersection LOS: E	
Intersection Capacity Utilization 69.6%		ICU Level of Service C	
Analysis Period (min) 15			
~ Volume exceeds capacity, queue is theoretically infinite.			
Queue shown is maximum after two cycles.			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 10: Soquel Canyon Pkwy & Pomona Rincon Rd





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	69	30	11	168	4	467	32	870	279	714	1131	69
Future Volume (veh/h)	69	30	11	168	4	467	32	870	279	714	1131	69
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	77	33	12	126	0	587	36	967	310	793	1257	77
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	113	83	30	153	0	1610	66	1336	513	1458	3111	191
Arrive On Green	0.06	0.06	0.06	0.09	0.00	0.09	0.04	0.24	0.24	0.42	0.63	0.63
Sat Flow, veh/h	1781	1309	476	1781	0	3170	1781	5611	1585	3456	4919	301
Grp Volume(v), veh/h	77	0	45	126	0	587	36	967	310	793	870	464
Grp Sat Flow(s),veh/h/ln	1781	0	1785	1781	0	1585	1781	1870	1585	1728	1702	1816
Q Serve(g_s), s	4.4	0.0	2.5	7.3	0.0	0.0	2.1	16.7	17.3	18.1	13.2	13.2
Cycle Q Clear(g_c), s	4.4	0.0	2.5	7.3	0.0	0.0	2.1	16.7	17.3	18.1	13.2	13.2
Prop In Lane	1.00		0.27	1.00		1.00	1.00		1.00	1.00		0.17
Lane Grp Cap(c), veh/h	113	0	114	153	0	1610	66	1336	513	1458	2153	1149
V/C Ratio(X)	0.68	0.00	0.40	0.83	0.00	0.36	0.54	0.72	0.60	0.54	0.40	0.40
Avail Cap(c_a), veh/h	594	0	595	153	0	1610	102	1336	513	1458	2153	1149
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	48.1	0.0	47.2	47.2	0.0	15.6	49.7	36.8	29.8	22.8	9.5	9.5
Incr Delay (d2), s/veh	6.9	0.0	2.2	29.4	0.0	0.1	6.8	3.4	5.2	0.4	0.6	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.2	0.0	1.2	4.5	0.0	4.2	1.0	7.6	7.8	6.8	4.2	4.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	55.0	0.0	49.4	76.6	0.0	15.8	56.5	40.3	35.0	23.2	10.1	10.6
LnGrp LOS	E	A	D	E	A	B	E	D	D	C	B	B
Approach Vol, veh/h		122			713			1313			2127	
Approach Delay, s/veh		53.0			26.5			39.5			15.1	
Approach LOS		D			C			D			B	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	49.3	30.0		11.7	7.9	71.4		14.0				
Change Period (Y+Rc), s	5.0	* 5		5.0	4.0	5.0		5.0				
Max Green Setting (Gmax), s	17.0	* 25		35.0	6.0	36.0		9.0				
Max Q Clear Time (g_c+I1), s	20.1	19.3		6.4	4.1	15.2		9.3				
Green Ext Time (p_c), s	0.0	3.3		0.4	0.0	8.3		0.0				

Intersection Summary			
HCM 6th Ctrl Delay		25.6	
HCM 6th LOS		C	

Notes

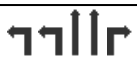
User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection Level Of Service Report
Intersection 11: Peyton Drive at Grand Avenue

Control Type:	Signalized	Delay (sec / veh):	37.9
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.647

Intersection Setup

Name	Peyton Drive			Peyton Drive			Grand Avenue			Grand Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	1	0	0	1	0	1	1	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Peyton Drive			Peyton Drive			Grand Avenue			Grand Avenue		
Base Volume Input [veh/h]	139	693	179	236	697	171	349	856	167	272	432	269
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	139	693	179	236	697	171	349	856	167	272	432	269
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	37	182	47	62	183	45	92	225	44	72	114	71
Total Analysis Volume [veh/h]	146	729	188	248	734	180	367	901	176	286	455	283
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	115
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	1	6	0	5	2	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	14	39	0	14	39	0	23	46	0	16	39	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	28	0	0	24	0	0	31	0	0	28	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	C	L	C	R	L	C	R
C, Cycle Length [s]	115	115	115	115	115	115	115	115	115	115	115	115
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	7	45	45	10	47	47	15	32	32	12	29	29
g / C, Green / Cycle	0.06	0.39	0.39	0.09	0.41	0.41	0.13	0.28	0.28	0.10	0.25	0.25
(v / s)_i Volume / Saturation Flow Rate	0.05	0.14	0.10	0.08	0.17	0.16	0.11	0.25	0.10	0.09	0.13	0.16
s, saturation flow rate [veh/h]	3200	5400	1800	3200	3600	1800	3200	3600	1800	3200	3600	1800
c, Capacity [veh/h]	202	2091	697	280	1482	741	429	1012	506	336	907	454
d1, Uniform Delay [s]	52.92	24.97	24.12	51.93	24.05	23.81	48.74	39.65	32.95	50.63	36.85	38.19
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	4.83	0.46	0.95	9.08	0.87	1.59	4.99	2.93	0.41	6.12	0.43	1.41
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.72	0.35	0.27	0.88	0.42	0.40	0.86	0.89	0.35	0.85	0.50	0.62
d, Delay for Lane Group [s/veh]	57.75	25.43	25.07	61.01	24.92	25.41	53.73	42.58	33.36	56.74	37.28	39.60
Lane Group LOS	E	C	C	E	C	C	D	D	C	E	D	D
Critical Lane Group	Yes	No	No	No	Yes	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	2.21	4.77	3.68	3.89	6.12	5.93	5.44	12.48	3.98	4.33	5.53	7.24
50th-Percentile Queue Length [ft/ln]	55.15	119.35	92.12	97.16	153.05	148.27	135.92	312.06	99.40	108.13	138.20	180.89
95th-Percentile Queue Length [veh/ln]	3.97	8.36	6.63	7.00	10.18	9.92	9.26	18.28	7.16	7.74	9.38	11.65
95th-Percentile Queue Length [ft/ln]	99.26	208.93	165.82	174.89	254.49	248.12	231.52	456.91	178.92	193.40	234.59	291.18

Movement, Approach, & Intersection Results

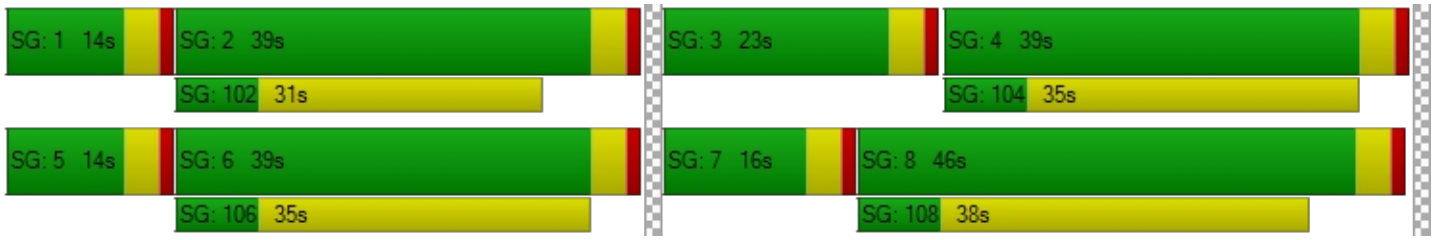
d_M, Delay for Movement [s/veh]	57.75	25.43	25.07	61.01	24.99	25.41	53.73	42.58	33.36	56.74	37.28	39.60
Movement LOS	E	C	C	E	C	C	D	D	C	E	D	D
d_A, Approach Delay [s/veh]	29.81			32.75			44.29			43.36		
Approach LOS	C			C			D			D		
d_I, Intersection Delay [s/veh]	37.95											
Intersection LOS	D											
Intersection V/C	0.647											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	47.05	47.05	47.05	47.05
l_p,int, Pedestrian LOS Score for Intersection	3.106	3.047	2.916	3.025
Crosswalk LOS	C	C	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	608	608	730	608
d_b, Bicycle Delay [s]	27.84	27.84	23.19	27.84
l_b,int, Bicycle LOS Score for Intersection	2.144	2.199	2.751	2.404
Bicycle LOS	B	B	C	B

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 12: Carbon Canyon Road at Fairway Drive/Ginseng Lane

Control Type:	Two-way stop	Delay (sec / veh):	230.5
Analysis Method:	HCM 7th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.609

Intersection Setup

Name	Carbon Canyon Road			Carbon Canyon Road			Fairway Drive			Ginseng Lane		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	0	0	0	1	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	45.00			45.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			No			No		

Volumes

Name	Carbon Canyon Road			Carbon Canyon Road			Fairway Drive			Ginseng Lane		
Base Volume Input [veh/h]	8	1475	4	9	572	12	18	0	13	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	8	1475	4	9	572	12	18	0	13	0	0	0
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	388	1	2	151	3	5	0	3	0	0	0
Total Analysis Volume [veh/h]	8	1553	4	9	602	13	19	0	14	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Free	Free	Stop	Stop
Flared Lane				No
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance			No	No
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.02	0.00	0.02	0.01	0.00	0.61	0.00	0.03	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	8.76	0.00	0.00	13.66	0.00	0.00	230.54	198.20	12.48	125.03	88.51	30.88
Movement LOS	A	A	A	B	A	A	F	F	B	F	F	D
95th-Percentile Queue Length [veh/ln]	0.03	0.00	0.00	0.06	0.00	0.00	2.01	2.01	0.09	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	0.63	0.00	0.00	1.62	0.00	0.00	50.31	50.31	2.18	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	0.04			0.20			138.03			81.48		
Approach LOS	A			A			F			F		
d_I, Intersection Delay [s/veh]	2.14											
Intersection LOS	F											

Intersection Level Of Service Report
Intersection 13: Carbon Canyon Road at Canyon Hills Road

Control Type:	Two-way stop	Delay (sec / veh):	144.9
Analysis Method:	HCM 7th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.702

Intersection Setup

Name	Carbon Canyon Road		Carbon Canyon Road		Canyon Hills Road	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	45.00		45.00		25.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name	Carbon Canyon Road		Carbon Canyon Road		Canyon Hills Road	
Base Volume Input [veh/h]	26	1463	467	57	36	30
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	26	1463	467	57	36	30
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	7	385	123	15	9	8
Total Analysis Volume [veh/h]	27	1540	492	60	38	32
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.03	0.02	0.00	0.00	0.70	0.06
d_M, Delay for Movement [s/veh]	8.63	0.00	0.00	0.00	144.86	84.89
Movement LOS	A	A	A	A	F	F
95th-Percentile Queue Length [veh/ln]	0.08	0.00	0.00	0.00	3.92	3.92
95th-Percentile Queue Length [ft/ln]	2.04	0.00	0.00	0.00	98.01	98.01
d_A, Approach Delay [s/veh]	0.15		0.00		117.44	
Approach LOS	A		A		F	
d_I, Intersection Delay [s/veh]	3.86					
Intersection LOS	F					

APPENDIX E-II

YEAR 2029 WITH PROJECT TRAFFIC CONDITIONS

Intersection Level Of Service Report
Intersection 1: Peyton Drive at Chino Avenue

Control Type:	Signalized	Delay (sec / veh):	38.3
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.530

Intersection Setup

Name	Peyton Drive			Peyton Drive			Chino Avenue			Chino Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	0	1	0	0	1	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Peyton Drive			Peyton Drive			Chino Avenue			Chino Avenue		
Base Volume Input [veh/h]	183	576	136	167	468	228	255	365	143	122	356	135
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	183	576	136	167	468	228	255	365	143	122	356	135
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	48	152	36	44	123	60	67	96	38	32	94	36
Total Analysis Volume [veh/h]	193	606	143	176	493	240	268	384	151	128	375	142
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	1	6	0	5	2	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	12	35	0	12	35	0	34	39	0	34	39	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	24	0	0	24	0	0	28	0	0	28	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	C	L	C	C	L	C	R
C, Cycle Length [s]	120	120	120	120	120	120	120	120	120	120	120	120
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	8	60	60	8	60	60	21	25	25	11	15	15
g / C, Green / Cycle	0.07	0.50	0.50	0.07	0.50	0.50	0.17	0.21	0.21	0.09	0.13	0.13
(v / s)_i Volume / Saturation Flow Rate	0.06	0.14	0.14	0.06	0.14	0.13	0.16	0.10	0.09	0.08	0.10	0.08
s, saturation flow rate [veh/h]	3200	3600	1800	3200	3600	1800	1700	3600	1800	1700	3600	1800
c, Capacity [veh/h]	216	1786	893	216	1786	893	298	762	381	156	462	231
d1, Uniform Delay [s]	55.57	17.74	17.63	55.26	17.67	17.60	48.49	41.52	41.21	53.55	50.92	49.52
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.18	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	12.27	0.40	0.75	7.38	0.38	0.74	14.77	0.47	0.82	10.10	3.49	2.65
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.90	0.28	0.27	0.82	0.28	0.27	0.90	0.48	0.45	0.82	0.81	0.61
d, Delay for Lane Group [s/veh]	67.84	18.14	18.39	62.63	18.05	18.34	63.27	41.99	42.04	63.64	54.41	52.17
Lane Group LOS	E	B	B	E	B	B	E	D	D	E	D	D
Critical Lane Group	Yes	No	No	No	Yes	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	3.27	4.19	4.10	2.85	4.06	4.03	9.06	4.80	4.49	4.23	5.70	4.21
50th-Percentile Queue Length [ft/ln]	81.64	104.64	102.49	71.23	101.62	100.80	226.40	119.98	112.24	105.78	142.62	105.17
95th-Percentile Queue Length [veh/ln]	5.88	7.53	7.38	5.13	7.32	7.26	13.99	8.39	7.96	7.60	9.62	7.57
95th-Percentile Queue Length [ft/ln]	146.95	188.35	184.49	128.21	182.91	181.45	349.79	209.79	199.11	190.12	240.55	189.26

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	67.84	18.18	18.39	62.63	18.05	18.34	63.27	41.99	42.04	63.64	54.41	52.17
Movement LOS	E	B	B	E	B	B	E	D	D	E	D	D
d_A, Approach Delay [s/veh]	28.39			26.76			49.10			55.75		
Approach LOS	C			C			D			E		
d_I, Intersection Delay [s/veh]	38.33											
Intersection LOS	D											
Intersection V/C	0.530											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	49.52	49.52	49.52	49.52
l_p,int, Pedestrian LOS Score for Intersection	2.948	2.974	2.832	2.795
Crosswalk LOS	C	C	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	517	517	583	583
d_b, Bicycle Delay [s]	33.02	33.02	30.12	30.12
l_b,int, Bicycle LOS Score for Intersection	2.078	2.060	2.001	2.092
Bicycle LOS	B	B	B	B

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 2: Gateway Village/Boys Republic Drive at Grand Avenue

Control Type:	Signalized	Delay (sec / veh):	52.2
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.930

Intersection Setup

Name	Boys Republic Drive			Gateway Village			Grand Avenue			Grand Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	1	1	0	0	1	0	0	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			No		

Volumes

Name	Boys Republic Drive			Gateway Village			Grand Avenue			Grand Avenue		
Base Volume Input [veh/h]	55	29	485	88	35	35	55	662	16	543	952	82
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	55	29	485	88	35	35	55	662	16	543	952	82
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	14	8	128	23	9	9	14	174	4	143	251	22
Total Analysis Volume [veh/h]	58	31	511	93	37	37	58	697	17	572	1002	86
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Split	Split	Split	Split	Split	Split	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	0	8	0	0	4	0	5	2	0	1	6	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	0	6	0	0	6	0	6	6	0	6	6	0
Maximum Green [s]	0	30	0	0	30	0	30	30	0	30	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	16	0	0	35	0	22	25	0	44	47	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	0	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	24	0	0	14	0	0	11	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall		No			No		No	No		No	No	
Maximum Recall		No			No		No	No		No	No	
Pedestrian Recall		No			No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	R	L	C	L	C	C	L	C	C
C, Cycle Length [s]	120	120	120	120	120	120	120	120	120	120
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	35	35	8	8	5	21	21	40	56	56
g / C, Green / Cycle	0.29	0.29	0.07	0.07	0.04	0.18	0.18	0.33	0.47	0.47
(v / s)_i Volume / Saturation Flow Rate	0.05	0.28	0.05	0.05	0.03	0.13	0.14	0.34	0.20	0.20
s, saturation flow rate [veh/h]	1700	1800	1700	1700	1700	3600	1800	1700	3600	1800
c, Capacity [veh/h]	491	520	115	115	74	635	318	567	1678	839
d1, Uniform Delay [s]	32.01	42.36	54.85	54.79	56.82	46.80	47.09	40.00	21.40	21.45
k, delay calibration	0.11	0.44	0.11	0.11	0.11	0.50	0.50	0.47	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.18	32.97	8.50	8.00	16.21	7.55	16.33	39.02	0.81	1.64
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.18	0.98	0.73	0.72	0.78	0.74	0.77	1.01	0.43	0.43
d, Delay for Lane Group [s/veh]	32.18	75.33	63.35	62.79	73.03	54.35	63.41	79.02	22.21	23.09
Lane Group LOS	C	E	E	E	E	D	E	F	C	C
Critical Lane Group	No	Yes	Yes	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	1.98	19.60	2.77	2.71	2.07	7.31	8.39	22.58	6.95	7.22
50th-Percentile Queue Length [ft/ln]	49.42	490.05	69.31	67.68	51.87	182.69	209.82	564.43	173.63	180.42
95th-Percentile Queue Length [veh/ln]	3.56	26.86	4.99	4.87	3.73	11.74	13.14	30.57	11.27	11.62
95th-Percentile Queue Length [ft/ln]	88.95	671.57	124.75	121.83	93.37	293.52	328.60	764.24	281.68	290.57

Movement, Approach, & Intersection Results

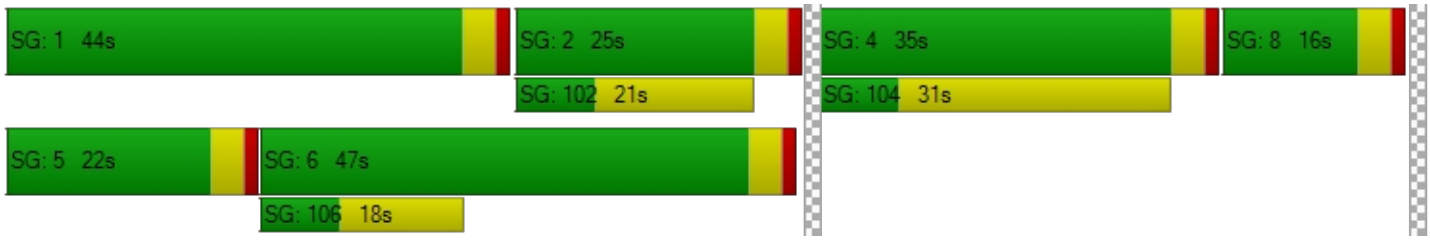
d_M, Delay for Movement [s/veh]	32.18	32.18	75.33	63.29	62.79	62.79	73.03	57.31	63.41	79.02	22.45	23.09
Movement LOS	C	C	E	E	E	E	E	E	E	F	C	C
d_A, Approach Delay [s/veh]	68.93			63.07			58.62			41.98		
Approach LOS	E			E			E			D		
d_I, Intersection Delay [s/veh]	52.15											
Intersection LOS	D											
Intersection V/C	0.930											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	0.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	49.50	49.50	49.50	0.00
l_p,int, Pedestrian LOS Score for Intersection	2.444	2.065	2.868	0.000
Crosswalk LOS	B	B	C	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	200	517	350	717
d_b, Bicycle Delay [s]	48.60	33.00	40.84	24.70
l_b,int, Bicycle LOS Score for Intersection	2.550	1.835	1.984	2.473
Bicycle LOS	B	A	A	B

Sequence

Ring 1	1	2	4	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 3: Peyton Drive at Eucalyptus Avenue

Control Type:	Signalized	Delay (sec / veh):	19.1
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.493

Intersection Setup

Name	Peyton Drive			Peyton Drive			Eucalyptus Avenue			Eucalyptus Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	1	1	0	0	1	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Peyton Drive			Peyton Drive			Eucalyptus Avenue			Eucalyptus Avenue		
Base Volume Input [veh/h]	21	668	121	196	585	257	287	129	19	142	120	286
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	21	668	121	196	585	257	287	129	19	142	120	286
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	6	176	32	52	154	68	76	34	5	37	32	75
Total Analysis Volume [veh/h]	22	703	127	206	616	271	302	136	20	149	126	301
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal Group	1	6	0	5	2	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	6	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	10	29	0	10	29	0	10	41	0	10	41	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	18	0	0	14	0	0	21	0	0	24	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		Yes	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	R	L	C	C	L	C	R
C, Cycle Length [s]	90	90	90	90	90	90	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	0.00	0.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	58	48	48	58	51	51	24	24	14	24	14	14
g / C, Green / Cycle	0.64	0.53	0.53	0.64	0.57	0.57	0.27	0.27	0.16	0.27	0.16	0.16
(v / s)_i Volume / Saturation Flow Rate	0.01	0.15	0.15	0.12	0.17	0.15	0.09	0.09	0.09	0.09	0.12	0.11
s, saturation flow rate [veh/h]	1700	3600	1800	1700	3600	1800	1700	1700	1800	1700	1800	1800
c, Capacity [veh/h]	1045	1911	956	1053	2048	1024	382	464	282	336	284	284
d1, Uniform Delay [s]	5.83	11.74	11.70	6.55	10.11	9.87	26.48	26.48	35.12	26.44	36.51	36.09
k, delay calibration	0.11	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.01	0.39	0.75	0.41	0.38	0.63	3.04	1.86	1.70	0.92	4.76	3.43
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.02	0.29	0.29	0.20	0.30	0.26	0.40	0.33	0.55	0.44	0.78	0.72
d, Delay for Lane Group [s/veh]	5.84	12.13	12.46	6.96	10.49	10.50	29.52	28.33	36.81	27.36	41.28	39.53
Lane Group LOS	A	B	B	A	B	B	C	C	D	C	D	D
Critical Lane Group	No	Yes	No	Yes	No	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.14	3.01	3.05	1.54	3.03	2.69	2.88	2.80	3.25	2.61	5.00	4.47
50th-Percentile Queue Length [ft/ln]	3.42	75.21	76.27	38.44	75.86	67.31	72.03	69.94	81.16	65.17	125.11	111.72
95th-Percentile Queue Length [veh/ln]	0.25	5.42	5.49	2.77	5.46	4.85	5.19	5.04	5.84	4.69	8.67	7.94
95th-Percentile Queue Length [ft/ln]	6.16	135.38	137.28	69.19	136.54	121.16	129.65	125.90	146.08	117.31	216.82	198.40

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	5.84	12.19	12.46	6.96	10.49	10.50	28.93	36.81	36.81	27.36	41.28	40.07
Movement LOS	A	B	B	A	B	B	C	D	D	C	D	D
d_A, Approach Delay [s/veh]	12.07			9.83			31.61			37.06		
Approach LOS	B			A			C			D		
d_I, Intersection Delay [s/veh]	19.08											
Intersection LOS	B											
Intersection V/C	0.493											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	34.72	34.72	34.72	34.72
l_p,int, Pedestrian LOS Score for Intersection	2.930	3.181	2.363	2.666
Crosswalk LOS	C	C	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	555	555	821	821
d_b, Bicycle Delay [s]	23.51	23.51	15.64	15.64
l_b,int, Bicycle LOS Score for Intersection	2.028	2.461	1.937	2.510
Bicycle LOS	B	B	A	B

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 4: Rustic Drive/Carbon Canyon Road at Chino Hills Parkway

Control Type:	Signalized	Delay (sec / veh):	34.7
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.839

Intersection Setup

Name	Carbon Canyon Road			Rustic Drive			Chino Hills Parkway			Chino Hills Parkway		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	1	0	0	1	0	1	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			No		

Volumes

Name	Carbon Canyon Road			Rustic Drive			Chino Hills Parkway			Chino Hills Parkway		
Base Volume Input [veh/h]	220	1	463	6	1	1	17	378	306	1336	786	8
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	220	1	463	6	1	1	17	378	306	1336	786	8
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	58	0	122	2	0	0	4	99	81	352	207	2
Total Analysis Volume [veh/h]	232	1	487	6	1	1	18	398	322	1406	827	8
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	0	8	0	0	4	0	5	2	0	1	6	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	0	6	0	0	6	0	6	6	0	6	6	0
Maximum Green [s]	0	30	0	0	30	0	30	30	0	30	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	32	0	0	32	0	10	29	0	59	78	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	0	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	21	0	0	18	0	0	11	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall		No			No		No	No		No	No	
Maximum Recall		No			No		No	No		No	No	
Pedestrian Recall		No			No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	L	C	R	L	C	C
C, Cycle Length [s]	120	120	120	120	120	120	120	120	120	120	120
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	19	19	19	19	19	3	34	34	54	86	86
g / C, Green / Cycle	0.16	0.16	0.16	0.16	0.16	0.02	0.29	0.29	0.45	0.72	0.72
(v / s)_i Volume / Saturation Flow Rate	0.14	0.14	0.14	0.00	0.00	0.01	0.11	0.18	0.44	0.23	0.23
s, saturation flow rate [veh/h]	1700	1800	1800	1700	1800	1700	3600	1800	3200	1800	1800
c, Capacity [veh/h]	304	290	290	83	290	40	1033	517	1446	1288	1288
d1, Uniform Delay [s]	48.89	48.84	48.84	42.37	42.27	57.80	34.27	37.12	32.13	6.31	6.31
k, delay calibration	0.12	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	4.28	6.94	6.91	0.36	0.01	7.84	1.09	5.58	6.26	0.67	0.67
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.76	0.84	0.84	0.07	0.01	0.45	0.39	0.62	0.97	0.32	0.32
d, Delay for Lane Group [s/veh]	53.17	55.78	55.75	42.73	42.28	65.64	35.35	42.69	38.39	6.98	6.98
Lane Group LOS	D	E	E	D	D	E	D	D	D	A	A
Critical Lane Group	Yes	No	No	No	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	7.10	7.64	7.63	0.16	0.05	0.63	4.83	9.00	20.51	3.82	3.82
50th-Percentile Queue Length [ft/ln]	177.46	190.95	190.79	3.98	1.27	15.66	120.79	224.88	512.83	95.39	95.39
95th-Percentile Queue Length [veh/ln]	11.47	12.17	12.16	0.29	0.09	1.13	8.44	13.91	27.94	6.87	6.87
95th-Percentile Queue Length [ft/ln]	286.69	304.26	304.05	7.17	2.29	28.19	210.90	347.85	698.53	171.70	171.70

Movement, Approach, & Intersection Results

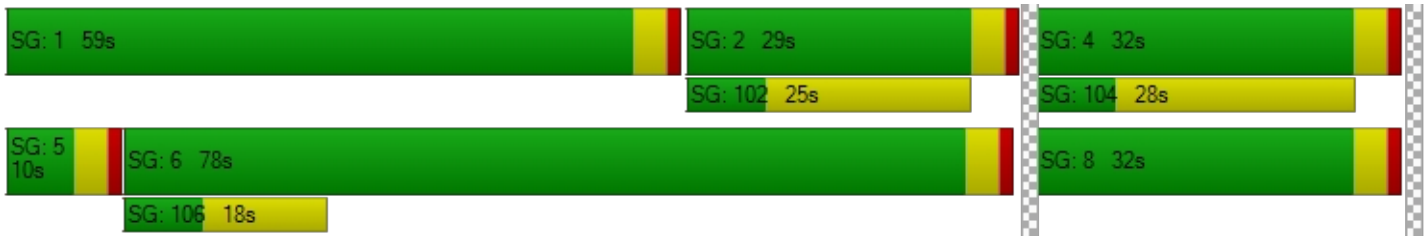
d_M, Delay for Movement [s/veh]	53.17	55.78	55.76	42.73	42.28	42.28	65.64	35.35	42.69	38.39	6.98	6.98
Movement LOS	D	E	E	D	D	D	E	D	D	D	A	A
d_A, Approach Delay [s/veh]	54.93			42.62			39.29			26.69		
Approach LOS	D			D			D			C		
d_I, Intersection Delay [s/veh]	34.72											
Intersection LOS	C											
Intersection V/C	0.839											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	0.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	49.49	49.49	49.49	0.00
l_p,int, Pedestrian LOS Score for Intersection	2.791	1.965	3.089	0.000
Crosswalk LOS	C	A	C	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	467	467	417	1234
d_b, Bicycle Delay [s]	35.25	35.25	37.59	8.81
l_b,int, Bicycle LOS Score for Intersection	2.748	1.573	2.168	3.408
Bicycle LOS	B	A	B	C

Sequence

Ring 1	1	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 5: Peyton Drive at Chino Hills Parkway

Control Type:	Signalized	Delay (sec / veh):	42.9
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.880

Intersection Setup

Name	Peyton Drive			Peyton Drive			Chino Hills Parkway			Chino Hills Parkway		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	1	1	0	0	1	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Peyton Drive			Peyton Drive			Chino Hills Parkway			Chino Hills Parkway		
Base Volume Input [veh/h]	604	393	292	192	214	336	187	540	148	200	1103	273
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	604	393	292	192	214	336	187	540	148	200	1103	273
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	159	103	77	51	56	88	49	142	39	53	290	72
Total Analysis Volume [veh/h]	636	414	307	202	225	354	197	568	156	211	1161	287
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Overlap	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	3	8	0	7	4	4	5	2	0	1	6	0
Auxiliary Signal Groups						4,5						
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	6	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	30	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	1.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	31	43	0	20	32	32	12	40	0	17	45	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	7	0	7	0	0	7	0
Pedestrian Clearance [s]	0	24	0	0	21	21	0	21	0	0	21	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No	No	No	No		No	No	
Maximum Recall	No	No		No	No	No	No	No		No	No	
Pedestrian Recall	No	No		No	No	No	No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	R	L	C	C	L	C	R
C, Cycle Length [s]	120	120	120	120	120	120	120	120	120	120	120	120
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	26	28	28	16	19	31	8	50	50	10	52	52
g / C, Green / Cycle	0.22	0.24	0.24	0.13	0.16	0.26	0.07	0.41	0.41	0.08	0.43	0.43
(v / s)_i Volume / Saturation Flow Rate	0.20	0.21	0.19	0.12	0.06	0.20	0.06	0.21	0.19	0.07	0.32	0.16
s, saturation flow rate [veh/h]	3200	1800	1800	1700	3600	1800	3200	1800	1800	3200	3600	1800
c, Capacity [veh/h]	689	426	426	227	560	461	216	743	743	267	1543	772
d1, Uniform Delay [s]	46.14	44.41	43.02	51.12	45.67	41.35	55.64	26.16	25.67	54.00	28.92	23.31
k, delay calibration	0.11	0.21	0.15	0.11	0.11	0.29	0.11	0.50	0.50	0.11	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	5.83	12.21	4.52	11.16	0.47	7.12	14.08	2.45	2.12	5.23	3.43	1.37
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.92	0.90	0.79	0.89	0.40	0.77	0.91	0.51	0.47	0.79	0.75	0.37
d, Delay for Lane Group [s/veh]	51.97	56.62	47.55	62.29	46.14	48.48	69.72	28.62	27.79	59.24	32.35	24.68
Lane Group LOS	D	E	D	E	D	D	E	C	C	E	C	C
Critical Lane Group	Yes	No	No	No	No	Yes	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	9.80	12.44	9.91	6.67	3.07	10.58	3.38	8.43	7.64	3.32	14.57	5.81
50th-Percentile Queue Length [ft/ln]	244.99	310.91	247.80	166.66	76.75	264.46	84.59	210.63	190.98	83.03	364.19	145.16
95th-Percentile Queue Length [veh/ln]	14.93	18.22	15.08	10.90	5.53	15.91	6.09	13.19	12.17	5.98	20.83	9.76
95th-Percentile Queue Length [ft/ln]	373.34	455.50	376.88	272.52	138.15	397.81	152.27	329.64	304.30	149.46	520.68	243.95

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	51.97	55.95	47.55	62.29	46.14	48.48	69.72	28.34	27.79	59.24	32.35	24.68
Movement LOS	D	E	D	E	D	D	E	C	C	E	C	C
d_A, Approach Delay [s/veh]	52.18			51.38			37.10			34.44		
Approach LOS	D			D			D			C		
d_I, Intersection Delay [s/veh]	42.87											
Intersection LOS	D											
Intersection V/C	0.880											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	49.52	49.52	49.52	49.52
l_p,int, Pedestrian LOS Score for Intersection	2.783	2.739	2.966	2.989
Crosswalk LOS	C	B	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	650	467	600	683
d_b, Bicycle Delay [s]	27.35	35.28	29.41	26.02
l_b,int, Bicycle LOS Score for Intersection	2.679	2.204	2.319	2.928
Bicycle LOS	B	B	B	C

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 6: Peyton Drive at Woodview Road

Control Type:	All-way stop	Delay (sec / veh):	12.5
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.450

Intersection Setup

Name	Peyton Drive			Peyton Drive			Woodview Road			Woodview Road		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	0	0	1	1	0	0	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			45.00			40.00			35.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			No			No		

Volumes

Name	Peyton Drive			Peyton Drive			Woodview Road			Woodview Road		
Base Volume Input [veh/h]	20	200	4	134	125	48	66	33	33	2	19	239
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	20	200	4	134	125	48	66	33	33	2	19	239
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	5	53	1	35	33	13	17	9	9	1	5	63
Total Analysis Volume [veh/h]	21	211	4	141	132	51	69	35	35	2	20	252
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	496	534	506	545	610	479	540	508	604
Degree of Utilization, x	0.04	0.40	0.28	0.24	0.08	0.14	0.13	0.00	0.45

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	0.13	1.93	1.13	0.94	0.27	0.50	0.44	0.01	2.33
95th-Percentile Queue Length [ft]	3.31	48.24	28.27	23.56	6.82	12.50	11.09	0.30	58.18
Approach Delay [s/veh]	13.59		11.54			10.91		13.42	
Approach LOS	B		B			B		B	
Intersection Delay [s/veh]	12.48								
Intersection LOS	B								

Intersection Level Of Service Report
Intersection 7: Pipeline Avenue at Woodview Road

Control Type:	Two-way stop	Delay (sec / veh):	113.7
Analysis Method:	HCM 7th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.755

Intersection Setup

Name	Pipeline Avenue		Pipeline Avenue		Woodview Road	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	40.00		30.00		35.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name	Pipeline Avenue		Pipeline Avenue		Woodview Road	
Base Volume Input [veh/h]	204	403	280	55	116	204
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	204	403	280	55	116	204
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	54	106	74	14	31	54
Total Analysis Volume [veh/h]	215	424	295	58	122	215
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.18	0.00	0.00	0.00	0.75	0.30
d_M, Delay for Movement [s/veh]	8.26	0.00	0.00	0.00	113.70	96.45
Movement LOS	A	A	A	A	F	F
95th-Percentile Queue Length [veh/ln]	0.41	0.41	0.00	0.00	12.38	12.38
95th-Percentile Queue Length [ft/ln]	10.15	10.15	0.00	0.00	309.62	309.62
d_A, Approach Delay [s/veh]	2.78		0.00		102.69	
Approach LOS	A		A		F	
d_I, Intersection Delay [s/veh]	27.38					
Intersection LOS	F					

Intersection Level Of Service Report
Intersection 8: Pipeline Avenue at Soquel Canyon Parkway

Control Type:	All-way stop	Delay (sec / veh):	34.7
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.981

Intersection Setup

Name	Pipeline Avenue		Soquel Canyon Parkway		Soquel Canyon Parkway	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	1	0	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	40.00		45.00		50.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		No	

Volumes

Name	Pipeline Avenue		Soquel Canyon Parkway		Soquel Canyon Parkway	
Base Volume Input [veh/h]	477	26	46	277	242	418
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	477	26	46	277	242	418
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	126	7	12	73	64	110
Total Analysis Volume [veh/h]	502	27	48	292	255	440
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	540	427	456	456	456	478	478	532
Degree of Utilization, x	0.98	0.11	0.21	0.21	0.21	0.27	0.27	0.83

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	13.45	0.38	0.80	0.80	0.80	1.06	1.06	8.33
95th-Percentile Queue Length [ft]	336.17	9.41	19.98	19.98	19.98	26.61	26.61	208.25
Approach Delay [s/veh]	59.76	12.64				26.34		
Approach LOS	F	B				D		
Intersection Delay [s/veh]	34.66							
Intersection LOS	D							

Intersection Level Of Service Report

Intersection 9: Soquel Canyon Parkway at Los Serranos Country Club Drive/Butterfield Ranch Road

Control Type:	Signalized	Delay (sec / veh):	33.6
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.564

Intersection Setup

Name	Soquel Canyon Parkway			Soquel Canyon Parkway			Lo Se			Butterfield Ranch Road		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	0	1	0	0	1	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Soquel Canyon Parkway			Soquel Canyon Parkway			Lo Se			Butterfield Ranch Road		
Base Volume Input [veh/h]	13	845	145	110	372	253	334	150	20	284	254	501
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	13	845	145	110	372	253	334	150	20	284	254	501
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	222	38	29	98	67	88	39	5	75	67	132
Total Analysis Volume [veh/h]	14	889	153	116	392	266	352	158	21	299	267	527
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Overlap
Signal Group	1	6	0	5	2	0	3	8	0	7	4	4
Auxiliary Signal Groups												4,5
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	6
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	30
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	3.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	1.0
Split [s]	18	39	0	10	31	0	32	39	0	32	39	39
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	3.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	7
Pedestrian Clearance [s]	0	28	0	0	18	0	0	28	0	0	28	28
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	2.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	2.0
Minimum Recall	No	No		No	No		No	No		No	No	No
Maximum Recall	No	No		No	No		No	No		No	No	No
Pedestrian Recall	No	No		No	No		No	No		No	No	No
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	C	L	C	C	L	C	R
C, Cycle Length [s]	120	120	120	120	120	120	120	120	120	120	120	120
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	0.00
g_i, Effective Green Time [s]	2	61	61	6	65	65	16	23	23	14	21	31
g / C, Green / Cycle	0.02	0.51	0.51	0.05	0.54	0.54	0.13	0.20	0.20	0.11	0.18	0.26
(v / s)_i Volume / Saturation Flow Rate	0.01	0.19	0.19	0.04	0.11	0.15	0.11	0.05	0.05	0.09	0.15	0.15
s, saturation flow rate [veh/h]	1700	3600	1800	3200	3600	1800	3200	1800	1800	3200	1800	3600
c, Capacity [veh/h]	33	1822	911	162	1934	967	421	352	352	366	321	945
d1, Uniform Delay [s]	58.18	18.17	18.08	56.13	14.42	15.08	50.88	40.94	40.87	51.92	47.59	38.26
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	8.21	0.61	1.19	5.73	0.24	0.70	4.45	0.39	0.37	4.46	5.58	0.52
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.42	0.38	0.38	0.71	0.20	0.28	0.84	0.26	0.25	0.82	0.83	0.56
d, Delay for Lane Group [s/veh]	66.39	18.79	19.27	61.86	14.66	15.79	55.33	41.32	41.24	56.38	53.17	38.78
Lane Group LOS	E	B	B	E	B	B	E	D	D	E	D	D
Critical Lane Group	No	Yes	No	Yes	No	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.50	6.04	6.03	1.86	2.82	4.10	5.42	2.33	2.25	4.62	8.18	6.77
50th-Percentile Queue Length [ft/ln]	12.42	151.04	150.86	46.53	70.42	102.40	135.44	58.31	56.32	115.54	204.59	169.37
95th-Percentile Queue Length [veh/ln]	0.89	10.07	10.06	3.35	5.07	7.37	9.23	4.20	4.05	8.15	12.88	11.04
95th-Percentile Queue Length [ft/ln]	22.36	251.82	251.58	83.75	126.75	184.33	230.87	104.96	101.37	203.68	321.88	276.08

Movement, Approach, & Intersection Results

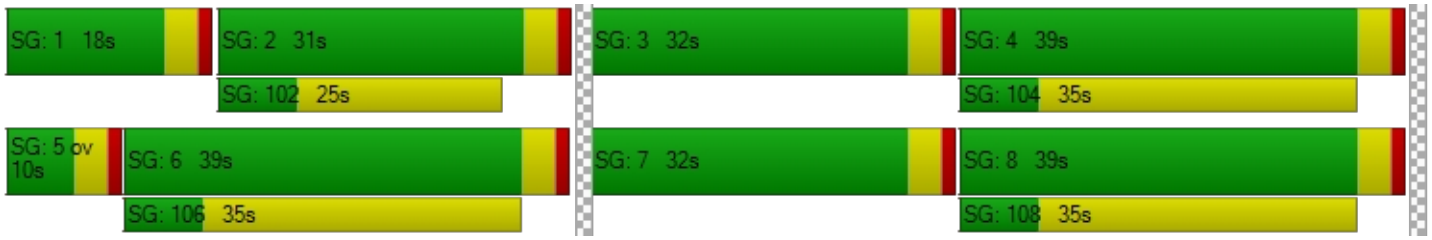
d_M, Delay for Movement [s/veh]	66.39	18.89	19.27	61.86	14.66	15.79	55.33	41.29	41.24	56.38	53.17	38.78
Movement LOS	E	B	B	E	B	B	E	D	D	E	D	D
d_A, Approach Delay [s/veh]	19.57			22.12			50.59			47.11		
Approach LOS	B			C			D			D		
d_I, Intersection Delay [s/veh]	33.63											
Intersection LOS	C											
Intersection V/C	0.564											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	49.52	49.52	49.52	49.52
l_p,int, Pedestrian LOS Score for Intersection	2.854	3.049	2.524	2.924
Crosswalk LOS	C	C	B	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	583	450	583	583
d_b, Bicycle Delay [s]	30.12	36.05	30.12	30.12
l_b,int, Bicycle LOS Score for Intersection	2.140	1.985	1.998	3.363
Bicycle LOS	B	A	A	C

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	

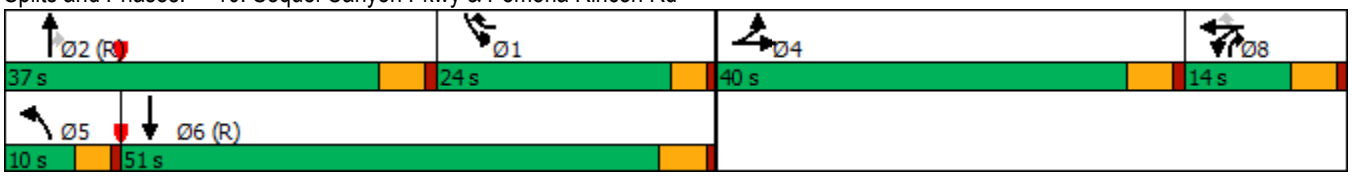


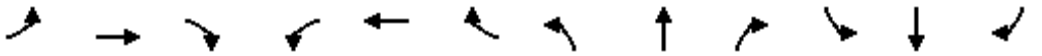
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	32	88	7	152	3	493	32	1376	381	645	593	59
Future Volume (vph)	32	88	7	152	3	493	32	1376	381	645	593	59
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	0.95	0.91	0.95	1.00	0.86	0.86	0.97	0.91	0.91
Frt		0.989			0.861	0.850		0.996	0.850		0.986	
Flt Protected	0.950			0.950	0.997		0.950			0.950		
Satd. Flow (prot)	1770	1842	0	1681	1455	1504	1770	4787	1362	3433	5014	0
Flt Permitted	0.950			0.950	0.997		0.950			0.950		
Satd. Flow (perm)	1770	1842	0	1681	1455	1504	1770	4787	1362	3433	5014	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		4			364	394		3	386		17	
Link Speed (mph)		25			25			50			50	
Link Distance (ft)		560			625			594			526	
Travel Time (s)		15.3			17.0			8.1			7.2	
Peak Hour Factor	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65
Adj. Flow (vph)	49	135	11	234	5	758	49	2117	586	992	912	91
Shared Lane Traffic (%)				10%		48%			10%			
Lane Group Flow (vph)	49	146	0	211	392	394	49	2176	527	992	1003	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2	1	1	2	1	1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100		20	100	20	20	100	20	20	100	
Trailing Detector (ft)	0	0		0	0	0	0	0	0	0	0	
Detector 1 Position(ft)	0	0		0	0	0	0	0	0	0	0	
Detector 1 Size(ft)	20	6		20	6	20	20	6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Split	NA		Split	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	
Protected Phases	4	4		8	8	1	5	2	8	1	6	
Permitted Phases						8			2			
Detector Phase	4	4		8	8	1	5	2	8	1	6	
Switch Phase												
Minimum Initial (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Split (s)	40.0	40.0		11.0	11.0	10.0	10.0	30.0	11.0	10.0	23.0	
Total Split (s)	40.0	40.0		14.0	14.0	24.0	10.0	37.0	14.0	24.0	51.0	
Total Split (%)	34.8%	34.8%		12.2%	12.2%	20.9%	8.7%	32.2%	12.2%	20.9%	44.3%	
Maximum Green (s)	35.0	35.0		9.0	9.0	20.0	6.0	32.0	9.0	20.0	46.0	
Yellow Time (s)	4.0	4.0		4.0	4.0	3.0	3.0	4.0	4.0	3.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0	4.0	4.0	5.0	5.0	4.0	5.0	
Lead/Lag						Lag	Lead	Lead		Lag	Lag	
Lead-Lag Optimize?						Yes	Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	None		None	None	None	None	C-Max	None	None	C-Max	
Walk Time (s)	7.0	7.0						7.0			7.0	
Flash Dont Walk (s)	28.0	28.0						18.0			11.0	
Pedestrian Calls (#/hr)	5	5						5			5	
Act Effct Green (s)	17.3	17.3		26.7	26.7	47.7	6.0	32.0	63.7	20.0	48.0	
Actuated g/C Ratio	0.15	0.15		0.23	0.23	0.41	0.05	0.28	0.55	0.17	0.42	
v/c Ratio	0.18	0.52		0.54	0.64	0.46	0.53	1.63	0.57	1.66	0.48	
Control Delay	40.2	48.3		47.3	11.9	3.4	74.2	317.3	8.1	336.7	25.3	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	40.2	48.3		47.3	11.9	3.4	74.2	317.3	8.1	336.7	25.3	
LOS	D	D		D	B	A	E	F	A	F	C	
Approach Delay		46.3			16.0			253.7			180.1	
Approach LOS		D			B			F			F	
Queue Length 50th (ft)	33	101		140	17	0	36	~910	53	~551	197	
Queue Length 95th (ft)	39	92		#256	6	0	55	#616	51	#424	158	
Internal Link Dist (ft)		480			545			514			446	
Turn Bay Length (ft)												
Base Capacity (vph)	538	563		389	616	854	92	1334	926	597	2102	
Starvation Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.09	0.26		0.54	0.64	0.46	0.53	1.63	0.57	1.66	0.48	

Intersection Summary			
Area Type:	Other		
Cycle Length: 115			
Actuated Cycle Length: 115			
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green			
Natural Cycle: 115			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.66			
Intersection Signal Delay: 182.3		Intersection LOS: F	
Intersection Capacity Utilization 78.0%		ICU Level of Service D	
Analysis Period (min) 15			
~ Volume exceeds capacity, queue is theoretically infinite.			
Queue shown is maximum after two cycles.			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 10: Soquel Canyon Pkwy & Pomona Rincon Rd





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	32	88	7	152	3	493	32	1376	381	645	593	59
Future Volume (veh/h)	32	88	7	152	3	493	32	1376	381	645	593	59
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	49	135	11	158	0	843	49	2117	586	992	912	91
Peak Hour Factor	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	183	175	14	139	0	1411	74	1561	565	1268	2892	288
Arrive On Green	0.10	0.10	0.10	0.08	0.00	0.08	0.04	0.28	0.28	0.37	0.61	0.61
Sat Flow, veh/h	1781	1706	139	1781	0	3170	1781	5611	1585	3456	4720	470
Grp Volume(v), veh/h	49	0	146	158	0	843	49	2117	586	992	657	346
Grp Sat Flow(s),veh/h/ln	1781	0	1845	1781	0	1585	1781	1870	1585	1728	1702	1786
Q Serve(g_s), s	2.9	0.0	8.9	9.0	0.0	0.0	3.1	32.0	32.0	29.3	10.7	10.7
Cycle Q Clear(g_c), s	2.9	0.0	8.9	9.0	0.0	0.0	3.1	32.0	32.0	29.3	10.7	10.7
Prop In Lane	1.00		0.08	1.00		1.00	1.00		1.00	1.00		0.26
Lane Grp Cap(c), veh/h	183	0	189	139	0	1411	74	1561	565	1268	2086	1094
V/C Ratio(X)	0.27	0.00	0.77	1.13	0.00	0.60	0.67	1.36	1.04	0.78	0.31	0.32
Avail Cap(c_a), veh/h	542	0	562	139	0	1411	93	1561	565	1268	2086	1094
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	47.6	0.0	50.3	53.0	0.0	24.1	54.3	41.5	34.1	32.3	10.7	10.7
Incr Delay (d2), s/veh	0.8	0.0	6.5	116.5	0.0	0.7	11.7	164.4	47.8	3.2	0.4	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	0.0	4.5	8.6	0.0	8.8	1.6	37.6	23.4	12.0	3.6	3.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	48.4	0.0	56.8	169.5	0.0	24.8	66.1	205.9	81.9	35.6	11.1	11.5
LnGrp LOS	D	A	E	F	A	C	E	F	F	D	B	B
Approach Vol, veh/h		195			1001			2752			1995	
Approach Delay, s/veh		54.7			47.6			177.0			23.3	
Approach LOS		D			D			F			C	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	47.2	37.0		16.8	8.7	75.5		14.0				
Change Period (Y+Rc), s	5.0	* 5		5.0	4.0	5.0		5.0				
Max Green Setting (Gmax), s	20.0	* 32		35.0	6.0	46.0		9.0				
Max Q Clear Time (g_c+I1), s	31.3	34.0		10.9	5.1	12.7		11.0				
Green Ext Time (p_c), s	0.0	0.0		1.0	0.0	6.7		0.0				

Intersection Summary			
HCM 6th Ctrl Delay		99.6	
HCM 6th LOS		F	

Notes

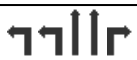
User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection Level Of Service Report
Intersection 11: Peyton Drive at Grand Avenue

Control Type:	Signalized	Delay (sec / veh):	33.9
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.678

Intersection Setup

Name	Peyton Drive			Peyton Drive			Grand Avenue			Grand Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	1	0	0	1	0	1	1	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Peyton Drive			Peyton Drive			Grand Avenue			Grand Avenue		
Base Volume Input [veh/h]	229	643	154	142	750	259	224	513	271	226	767	102
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	229	643	154	142	750	259	224	513	271	226	767	102
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	60	169	41	37	197	68	59	135	71	59	202	27
Total Analysis Volume [veh/h]	241	677	162	149	789	273	236	540	285	238	807	107
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	105
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	1	6	0	5	2	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	14	39	0	10	35	0	13	42	0	14	43	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	28	0	0	24	0	0	31	0	0	28	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	C	L	C	R	L	C	R
C, Cycle Length [s]	105	105	105	105	105	105	105	105	105	105	105	105
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	10	47	47	6	43	43	9	26	26	10	27	27
g / C, Green / Cycle	0.09	0.45	0.45	0.06	0.41	0.41	0.09	0.25	0.25	0.09	0.26	0.26
(v / s)_i Volume / Saturation Flow Rate	0.08	0.13	0.09	0.05	0.20	0.19	0.07	0.15	0.16	0.07	0.22	0.06
s, saturation flow rate [veh/h]	3200	5400	1800	3200	3600	1800	3200	3600	1800	3200	3600	1800
c, Capacity [veh/h]	300	2415	805	186	1481	740	276	899	449	297	923	461
d1, Uniform Delay [s]	46.68	18.37	17.65	48.92	22.82	22.38	47.36	34.81	35.15	46.72	37.47	30.91
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	4.99	0.29	0.56	7.86	1.17	1.99	7.38	0.65	1.49	4.96	2.80	0.25
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.80	0.28	0.20	0.80	0.49	0.45	0.85	0.60	0.63	0.80	0.87	0.23
d, Delay for Lane Group [s/veh]	51.67	18.66	18.22	56.78	23.99	24.37	54.74	35.46	36.64	51.68	40.28	31.17
Lane Group LOS	D	B	B	E	C	C	D	D	D	D	D	C
Critical Lane Group	Yes	No	No	No	Yes	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	3.28	3.48	2.48	2.13	6.74	6.28	3.31	6.12	6.63	3.24	10.15	2.17
50th-Percentile Queue Length [ft/ln]	82.00	86.92	61.99	53.16	168.48	157.10	82.84	153.05	165.63	80.97	253.78	54.36
95th-Percentile Queue Length [veh/ln]	5.90	6.26	4.46	3.83	11.00	10.40	5.96	10.18	10.85	5.83	15.38	3.91
95th-Percentile Queue Length [ft/ln]	147.60	156.45	111.59	95.68	274.92	259.88	149.12	254.49	271.16	145.74	384.41	97.85

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	51.67	18.66	18.22	56.78	24.02	24.37	54.74	35.46	36.64	51.68	40.28	31.17
Movement LOS	D	B	B	E	C	C	D	D	D	D	D	C
d_A, Approach Delay [s/veh]	25.96			28.13			40.07			41.79		
Approach LOS	C			C			D			D		
d_I, Intersection Delay [s/veh]	33.91											
Intersection LOS	C											
Intersection V/C	0.678											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	42.11	42.11	42.11	42.11
l_p,int, Pedestrian LOS Score for Intersection	3.116	3.005	2.933	2.977
Crosswalk LOS	C	C	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	666	590	723	742
d_b, Bicycle Delay [s]	23.36	26.10	21.40	20.77
l_b,int, Bicycle LOS Score for Intersection	2.154	2.226	2.435	2.510
Bicycle LOS	B	B	B	B

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 12: Carbon Canyon Road at Fairway Drive/Ginseng Lane

Control Type:	Two-way stop	Delay (sec / veh):	487.7
Analysis Method:	HCM 7th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.289

Intersection Setup

Name	Carbon Canyon Road			Carbon Canyon Road			Fairway Drive			Ginseng Lane		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	0	0	0	1	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	45.00			45.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			No			No		

Volumes

Name	Carbon Canyon Road			Carbon Canyon Road			Fairway Drive			Ginseng Lane		
Base Volume Input [veh/h]	23	524	0	1	1564	26	33	0	28	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	23	524	0	1	1564	26	33	0	28	0	0	0
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	6	138	0	0	412	7	9	0	7	0	0	0
Total Analysis Volume [veh/h]	24	552	0	1	1646	27	35	0	29	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Free	Free	Stop	Stop
Flared Lane				No
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance			No	No
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.06	0.01	0.00	0.00	0.02	0.00	1.29	0.00	0.24	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	15.02	0.00	0.00	8.54	0.00	0.00	487.72	449.09	44.12	183.94	100.88	11.75
Movement LOS	C	A	A	A	A	A	F	F	E	F	F	B
95th-Percentile Queue Length [veh/ln]	0.20	0.00	0.00	0.00	0.00	0.00	4.15	4.15	0.88	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	4.99	0.00	0.00	0.07	0.00	0.00	103.68	103.68	22.08	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	0.63			0.01			286.71			98.86		
Approach LOS	A			A			F			F		
d_I, Intersection Delay [s/veh]	8.09											
Intersection LOS	F											

Intersection Level Of Service Report
Intersection 13: Carbon Canyon Road at Canyon Hills Road

Control Type:	Two-way stop	Delay (sec / veh):	376.4
Analysis Method:	HCM 7th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.037

Intersection Setup

Name	Carbon Canyon Road		Carbon Canyon Road		Canyon Hills Road	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	45.00		45.00		25.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name	Carbon Canyon Road		Carbon Canyon Road		Canyon Hills Road	
Base Volume Input [veh/h]	16	412	1552	30	52	47
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	16	412	1552	30	52	47
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	4	108	408	8	14	12
Total Analysis Volume [veh/h]	17	434	1634	32	55	49
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.04	0.00	0.02	0.00	1.04	0.40
d_M, Delay for Movement [s/veh]	14.76	0.00	0.00	0.00	376.42	338.05
Movement LOS	B	A	A	A	F	F
95th-Percentile Queue Length [veh/ln]	0.14	0.00	0.00	0.00	8.53	8.53
95th-Percentile Queue Length [ft/ln]	3.45	0.00	0.00	0.00	213.34	213.34
d_A, Approach Delay [s/veh]	0.56		0.00		358.34	
Approach LOS	A		A		F	
d_I, Intersection Delay [s/veh]	16.89					
Intersection LOS	F					

Intersection Level Of Service Report
Intersection 1: Peyton Drive at Chino Avenue

Control Type:	Signalized	Delay (sec / veh):	32.8
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.650

Intersection Setup

Name	Peyton Drive			Peyton Drive			Chino Avenue			Chino Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	0	1	0	0	1	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Peyton Drive			Peyton Drive			Chino Avenue			Chino Avenue		
Base Volume Input [veh/h]	133	734	202	375	944	168	104	199	139	152	157	311
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	133	734	202	375	944	168	104	199	139	152	157	311
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	35	193	53	99	248	44	27	52	37	40	41	82
Total Analysis Volume [veh/h]	140	773	213	395	994	177	109	209	146	160	165	327
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	1	6	0	5	2	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	10	35	0	20	45	0	12	39	0	16	43	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	24	0	0	24	0	0	28	0	0	28	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	C	L	C	C	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	6	48	48	15	57	57	8	19	19	12	23	23
g / C, Green / Cycle	0.05	0.44	0.44	0.14	0.52	0.52	0.07	0.17	0.17	0.11	0.21	0.21
(v / s)_i Volume / Saturation Flow Rate	0.04	0.19	0.18	0.12	0.22	0.21	0.06	0.06	0.08	0.09	0.05	0.18
s, saturation flow rate [veh/h]	3200	3600	1800	3200	3600	1800	1700	3600	1800	1700	3600	1800
c, Capacity [veh/h]	177	1565	782	451	1872	936	125	611	305	186	741	370
d1, Uniform Delay [s]	51.37	21.62	21.35	46.36	16.23	16.11	50.50	40.30	41.31	48.18	36.39	42.43
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	7.66	0.86	1.55	5.57	0.70	1.32	16.60	0.33	1.16	10.82	0.15	6.97
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.79	0.43	0.40	0.88	0.42	0.41	0.87	0.34	0.48	0.86	0.22	0.88
d, Delay for Lane Group [s/veh]	59.03	22.48	22.90	51.94	16.93	17.43	67.10	40.63	42.47	59.00	36.54	49.40
Lane Group LOS	E	C	C	D	B	B	E	D	D	E	D	D
Critical Lane Group	No	Yes	No	Yes	No	No	Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	2.09	6.10	5.85	5.62	6.11	6.06	3.54	2.53	3.68	4.86	1.87	9.27
50th-Percentile Queue Length [ft/ln]	52.30	152.53	146.26	140.47	152.84	151.56	88.50	63.13	91.88	121.49	46.65	231.73
95th-Percentile Queue Length [veh/ln]	3.77	10.15	9.82	9.51	10.17	10.10	6.37	4.55	6.62	8.48	3.36	14.26
95th-Percentile Queue Length [ft/ln]	94.15	253.80	245.42	237.66	254.22	252.51	159.30	113.64	165.38	211.88	83.96	356.56

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	59.03	22.54	22.90	51.94	17.03	17.43	67.10	40.63	42.47	59.00	36.54	49.40
Movement LOS	E	C	C	D	B	B	E	D	D	E	D	D
d_A, Approach Delay [s/veh]	27.14			25.88			47.43			48.50		
Approach LOS	C			C			D			D		
d_I, Intersection Delay [s/veh]	32.75											
Intersection LOS	C											
Intersection V/C	0.650											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	44.58	44.58	44.58	44.58
l_p,int, Pedestrian LOS Score for Intersection	3.031	3.073	2.735	2.808
Crosswalk LOS	C	C	B	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	563	745	636	709
d_b, Bicycle Delay [s]	28.39	21.66	25.59	22.94
l_b,int, Bicycle LOS Score for Intersection	2.179	2.421	1.815	2.098
Bicycle LOS	B	B	A	B

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 2: Gateway Village/Boys Republic Drive at Grand Avenue

Control Type:	Signalized	Delay (sec / veh):	203.2
Analysis Method:	HCM 7th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.513

Intersection Setup

Name	Boys Republic Drive			Gateway Village			Grand Avenue			Grand Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	1	1	0	0	1	0	0	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			No		

Volumes

Name	Boys Republic Drive			Gateway Village			Grand Avenue			Grand Avenue		
Base Volume Input [veh/h]	36	34	715	276	54	73	115	1192	61	837	1212	133
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	36	34	715	276	54	73	115	1192	61	837	1212	133
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	9	9	188	73	14	19	30	314	16	220	319	35
Total Analysis Volume [veh/h]	38	36	753	291	57	77	121	1255	64	881	1276	140
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Split	Split	Split	Split	Split	Split	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	0	8	0	0	4	0	5	2	0	1	6	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	0	6	0	0	6	0	6	6	0	6	6	0
Maximum Green [s]	0	30	0	0	30	0	30	30	0	30	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	20	0	0	35	0	14	25	0	40	51	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	0	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	24	0	0	14	0	0	11	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall		No			No		No	No		No	No	
Maximum Recall		No			No		No	No		No	No	
Pedestrian Recall		No			No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	R	L	C	L	C	C	L	C	C
C, Cycle Length [s]	120	120	120	120	120	120	120	120	120	120
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	29	29	18	18	10	21	21	36	47	47
g / C, Green / Cycle	0.24	0.24	0.15	0.15	0.08	0.18	0.18	0.30	0.39	0.39
(v / s)_i Volume / Saturation Flow Rate	0.04	0.42	0.13	0.12	0.07	0.24	0.25	0.52	0.26	0.26
s, saturation flow rate [veh/h]	1700	1800	1700	1700	1700	3600	1800	1700	3600	1800
c, Capacity [veh/h]	412	437	252	252	142	634	317	510	1413	707
d1, Uniform Delay [s]	35.99	45.45	49.88	49.67	54.27	49.44	49.44	42.01	29.96	30.12
k, delay calibration	0.11	0.50	0.11	0.11	0.11	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.21	335.63	8.21	6.98	13.21	178.76	201.94	335.78	2.48	5.10
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.18	1.72	0.86	0.83	0.85	1.38	1.41	1.73	0.66	0.67
d, Delay for Lane Group [s/veh]	36.20	381.08	58.10	56.64	67.48	228.20	251.38	377.79	32.44	35.22
Lane Group LOS	D	F	E	E	E	F	F	F	C	D
Critical Lane Group	No	Yes	Yes	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	1.75	53.59	6.88	6.58	4.13	25.21	27.25	62.45	11.53	12.27
50th-Percentile Queue Length [ft/ln]	43.82	1339.68	171.98	164.43	103.14	630.27	681.31	1561.19	288.24	306.79
95th-Percentile Queue Length [veh/ln]	3.15	82.97	11.18	10.78	7.43	38.51	41.61	97.15	17.10	18.02
95th-Percentile Queue Length [ft/ln]	78.87	2074.15	279.51	269.58	185.66	962.78	1040.23	2428.82	427.46	450.41

Movement, Approach, & Intersection Results

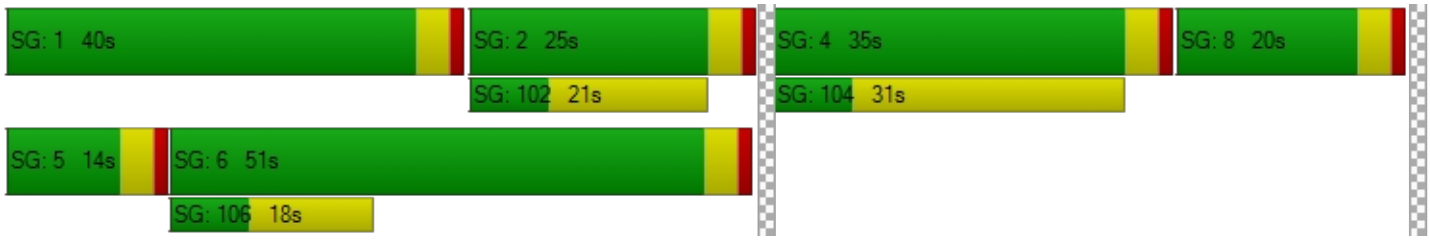
d_M, Delay for Movement [s/veh]	36.20	36.20	381.08	57.71	56.64	56.64	67.48	235.27	251.38	377.79	33.17	35.22
Movement LOS	D	D	F	E	E	E	E	F	F	F	C	D
d_A, Approach Delay [s/veh]	350.22			57.38			221.89			165.48		
Approach LOS	F			E			F			F		
d_I, Intersection Delay [s/veh]	203.17											
Intersection LOS	F											
Intersection V/C	1.513											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	0.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	49.51	49.51	49.51	0.00
l_p,int, Pedestrian LOS Score for Intersection	2.591	2.189	3.002	0.000
Crosswalk LOS	B	B	C	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	267	517	350	783
d_b, Bicycle Delay [s]	45.07	33.01	40.84	22.21
l_b,int, Bicycle LOS Score for Intersection	2.924	2.261	2.352	2.823
Bicycle LOS	C	B	B	C

Sequence

Ring 1	1	2	4	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 3: Peyton Drive at Eucalyptus Avenue

Control Type:	Signalized	Delay (sec / veh):	21.3
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.534

Intersection Setup

Name	Peyton Drive			Peyton Drive			Eucalyptus Avenue			Eucalyptus Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	1	1	0	0	1	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Peyton Drive			Peyton Drive			Eucalyptus Avenue			Eucalyptus Avenue		
Base Volume Input [veh/h]	43	535	190	228	689	332	219	280	23	181	269	220
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	43	535	190	228	689	332	219	280	23	181	269	220
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	11	141	50	60	181	87	58	74	6	48	71	58
Total Analysis Volume [veh/h]	45	563	200	240	725	349	231	295	24	191	283	232
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal Group	1	6	0	5	2	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	6	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	10	29	0	10	29	0	16	41	0	10	35	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	18	0	0	14	0	0	21	0	0	24	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		Yes	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	R	L	C	C	L	C	R
C, Cycle Length [s]	90	90	90	90	90	90	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	0.00	0.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	53	43	43	53	45	45	29	29	19	29	18	18
g / C, Green / Cycle	0.59	0.48	0.48	0.59	0.50	0.50	0.32	0.32	0.21	0.32	0.20	0.20
(v / s)_i Volume / Saturation Flow Rate	0.03	0.14	0.14	0.14	0.20	0.19	0.07	0.07	0.18	0.11	0.16	0.13
s, saturation flow rate [veh/h]	1700	3600	1800	1700	3600	1800	1700	1700	1800	1700	1800	1800
c, Capacity [veh/h]	890	1723	861	960	1799	899	421	553	376	260	365	365
d1, Uniform Delay [s]	7.77	14.33	14.19	8.81	14.13	14.00	22.31	22.31	34.30	23.43	34.01	32.91
k, delay calibration	0.11	0.50	0.50	0.50	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.02	0.45	0.82	0.62	0.67	1.26	0.35	0.19	5.36	4.03	3.56	1.84
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.05	0.30	0.28	0.25	0.40	0.39	0.27	0.21	0.85	0.74	0.78	0.64
d, Delay for Lane Group [s/veh]	7.79	14.78	15.01	9.43	14.80	15.26	22.66	22.50	39.66	27.46	37.58	34.75
Lane Group LOS	A	B	B	A	B	B	C	C	D	C	D	C
Critical Lane Group	No	Yes	No	Yes	No	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	0.35	3.18	3.06	2.22	4.52	4.47	1.79	1.78	7.12	3.33	6.10	4.74
50th-Percentile Queue Length [ft/ln]	8.63	79.46	76.51	55.45	113.12	111.77	44.81	44.51	178.08	83.32	152.55	118.50
95th-Percentile Queue Length [veh/ln]	0.62	5.72	5.51	3.99	8.01	7.94	3.23	3.20	11.50	6.00	10.15	8.31
95th-Percentile Queue Length [ft/ln]	15.53	143.04	137.72	99.82	200.33	198.46	80.66	80.11	287.51	149.97	253.83	207.76

Movement, Approach, & Intersection Results

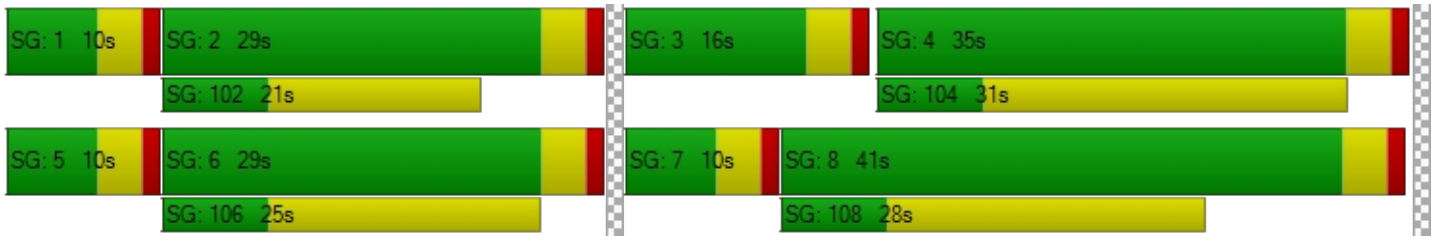
d_M, Delay for Movement [s/veh]	7.79	14.79	15.01	9.43	14.80	15.26	22.63	39.66	39.66	27.46	37.58	34.75
Movement LOS	A	B	B	A	B	B	C	D	D	C	D	C
d_A, Approach Delay [s/veh]	14.46			13.94			32.49			33.91		
Approach LOS	B			B			C			C		
d_I, Intersection Delay [s/veh]	21.26											
Intersection LOS	C											
Intersection V/C	0.534											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	34.72	34.72	34.72	34.72
l_p,int, Pedestrian LOS Score for Intersection	3.008	3.120	2.463	2.752
Crosswalk LOS	C	C	B	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	555	555	821	688
d_b, Bicycle Delay [s]	23.51	23.51	15.64	19.38
l_b,int, Bicycle LOS Score for Intersection	2.004	2.644	2.013	2.725
Bicycle LOS	B	B	B	B

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 4: Rustic Drive/Carbon Canyon Road at Chino Hills Parkway

Control Type:	Signalized	Delay (sec / veh):	53.1
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.995

Intersection Setup

Name	Carbon Canyon Road			Rustic Drive			Chino Hills Parkway			Chino Hills Parkway		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	1	0	0	1	0	1	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			No		

Volumes

Name	Carbon Canyon Road			Rustic Drive			Chino Hills Parkway			Chino Hills Parkway		
Base Volume Input [veh/h]	269	1	1526	17	1	1	11	830	197	613	782	16
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	269	1	1526	17	1	1	11	830	197	613	782	16
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	71	0	402	4	0	0	3	218	52	161	206	4
Total Analysis Volume [veh/h]	283	1	1606	18	1	1	12	874	207	645	823	17
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	115
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	0	8	0	0	4	0	5	2	0	1	6	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	0	6	0	0	6	0	6	6	0	6	6	0
Maximum Green [s]	0	30	0	0	30	0	30	30	0	30	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	56	0	0	56	0	10	32	0	27	49	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	0	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	21	0	0	18	0	0	11	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall		No			No		No	No		No	No	
Maximum Recall		No			No		No	No		No	No	
Pedestrian Recall		No			No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	L	C	R	L	C	C
C, Cycle Length [s]	115	115	115	115	115	115	115	115	115	115	115
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	52	52	52	52	52	2	28	28	23	49	49
g / C, Green / Cycle	0.45	0.45	0.45	0.45	0.45	0.02	0.24	0.24	0.20	0.43	0.43
(v / s)_i Volume / Saturation Flow Rate	0.17	0.45	0.45	0.01	0.00	0.01	0.24	0.12	0.20	0.23	0.23
s, saturation flow rate [veh/h]	1700	1800	1800	1700	1800	1700	3600	1800	3200	1800	1800
c, Capacity [veh/h]	795	812	812	63	812	29	879	439	640	769	769
d1, Uniform Delay [s]	20.76	31.26	31.26	17.49	17.32	55.94	43.38	37.11	45.98	24.62	24.58
k, delay calibration	0.11	0.46	0.46	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.27	27.78	27.78	2.47	0.00	9.13	29.08	3.59	18.24	2.80	2.76
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.36	0.99	0.99	0.29	0.00	0.41	0.99	0.47	1.01	0.55	0.54
d, Delay for Lane Group [s/veh]	21.03	59.03	59.03	19.96	17.32	65.07	72.45	40.71	64.23	27.42	27.35
Lane Group LOS	C	E	E	B	B	E	E	D	F	C	C
Critical Lane Group	No	Yes	No	No	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	5.03	27.50	27.50	0.31	0.03	0.42	15.82	5.41	10.70	9.07	9.01
50th-Percentile Queue Length [ft/ln]	125.64	687.44	687.44	7.73	0.74	10.46	395.59	135.34	267.46	226.78	225.20
95th-Percentile Queue Length [veh/ln]	8.70	36.10	36.10	0.56	0.05	0.75	22.35	9.23	16.12	14.01	13.93
95th-Percentile Queue Length [ft/ln]	217.56	902.44	902.44	13.91	1.33	18.82	558.69	230.74	403.04	350.27	348.25

Movement, Approach, & Intersection Results

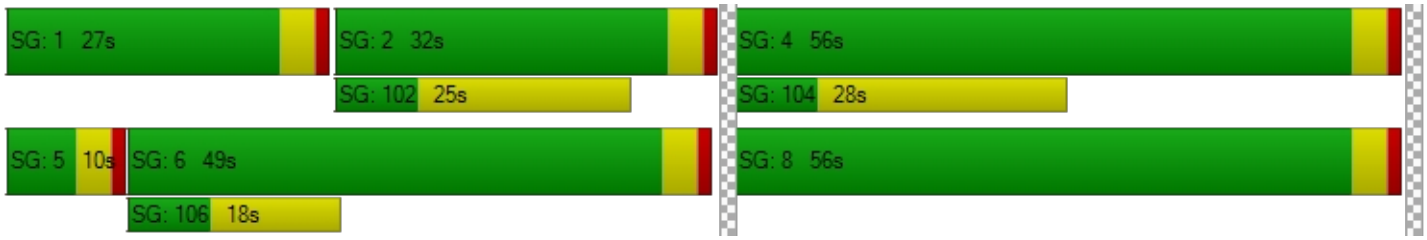
d_M, Delay for Movement [s/veh]	21.03	59.03	59.03	19.96	17.32	17.32	65.07	72.45	40.71	64.23	27.38	27.35
Movement LOS	C	E	E	B	B	B	E	E	D	F	C	C
d_A, Approach Delay [s/veh]	53.34			19.70			66.36			43.38		
Approach LOS	D			B			E			D		
d_I, Intersection Delay [s/veh]	53.07											
Intersection LOS	D											
Intersection V/C	0.995											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	0.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	47.02	47.02	47.02	0.00
l_p,int, Pedestrian LOS Score for Intersection	2.846	1.968	3.225	0.000
Crosswalk LOS	C	A	C	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	904	904	487	783
d_b, Bicycle Delay [s]	17.25	17.25	32.90	21.30
l_b,int, Bicycle LOS Score for Intersection	4.678	1.593	2.461	2.785
Bicycle LOS	E	A	B	C

Sequence

Ring 1	1	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 5: Peyton Drive at Chino Hills Parkway

Control Type:	Signalized	Delay (sec / veh):	100.6
Analysis Method:	HCM 7th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.182

Intersection Setup

Name	Peyton Drive			Peyton Drive			Chino Hills Parkway			Chino Hills Parkway		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	1	1	0	0	1	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Peyton Drive			Peyton Drive			Chino Hills Parkway			Chino Hills Parkway		
Base Volume Input [veh/h]	230	286	203	383	427	198	399	1347	530	261	955	336
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	230	286	203	383	427	198	399	1347	530	261	955	336
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	61	75	53	101	112	52	105	354	139	69	251	88
Total Analysis Volume [veh/h]	242	301	214	403	449	208	420	1418	558	275	1005	354
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Overlap	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	3	8	0	7	4	4	5	2	0	1	6	0
Auxiliary Signal Groups						4,5						
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	6	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	30	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	1.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	22	35	0	27	40	40	22	46	0	12	36	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	7	0	7	0	0	7	0
Pedestrian Clearance [s]	0	24	0	0	21	21	0	21	0	0	21	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No	No	No	No		No	No	
Maximum Recall	No	No		No	No	No	No	No		No	No	
Pedestrian Recall	No	No		No	No	No	No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	R	L	C	C	L	C	R
C, Cycle Length [s]	120	120	120	120	120	120	120	120	120	120	120	120
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	11	21	21	23	33	54	18	52	52	8	42	42
g / C, Green / Cycle	0.09	0.17	0.17	0.19	0.27	0.45	0.15	0.43	0.43	0.07	0.35	0.35
(v / s)_i Volume / Saturation Flow Rate	0.08	0.15	0.13	0.24	0.12	0.12	0.13	0.55	0.55	0.09	0.28	0.20
s, saturation flow rate [veh/h]	3200	1800	1800	1700	3600	1800	3200	1800	1800	3200	3600	1800
c, Capacity [veh/h]	304	315	315	326	979	815	472	777	777	218	1268	634
d1, Uniform Delay [s]	53.22	48.25	47.14	48.54	36.36	20.33	50.24	34.13	34.13	55.98	34.96	31.37
k, delay calibration	0.11	0.15	0.11	0.41	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	4.76	10.32	3.77	125.97	0.34	0.16	5.94	132.14	132.14	126.50	5.14	3.53
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.80	0.87	0.76	1.24	0.46	0.26	0.89	1.27	1.27	1.26	0.79	0.56
d, Delay for Lane Group [s/veh]	57.98	58.57	50.92	174.51	36.70	20.49	56.18	166.27	166.27	182.47	40.10	34.90
Lane Group LOS	E	E	D	F	D	C	E	F	F	F	D	C
Critical Lane Group	No	Yes	No	Yes	No	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	3.78	8.92	7.14	21.14	5.53	3.65	6.57	50.45	50.45	7.12	13.94	8.86
50th-Percentile Queue Length [ft/ln]	94.41	222.90	178.45	528.38	138.29	91.30	164.19	1261.28	1261.28	178.01	348.44	221.48
95th-Percentile Queue Length [veh/ln]	6.80	13.81	11.52	31.78	9.39	6.57	10.77	72.93	72.93	12.31	20.06	13.74
95th-Percentile Queue Length [ft/ln]	169.94	345.32	287.98	794.55	234.72	164.33	269.26	1823.22	1823.22	307.63	501.50	343.51

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	57.98	57.92	50.92	174.51	36.70	20.49	56.18	166.27	166.27	182.47	40.10	34.90
Movement LOS	E	E	D	F	D	C	E	F	F	F	D	C
d_A, Approach Delay [s/veh]	55.96			85.91			146.97			62.93		
Approach LOS	E			F			F			E		
d_I, Intersection Delay [s/veh]	100.63											
Intersection LOS	F											
Intersection V/C	1.182											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	49.54	49.54	49.54	49.54
l_p,int, Pedestrian LOS Score for Intersection	2.798	2.814	3.092	3.119
Crosswalk LOS	C	C	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	516	600	700	533
d_b, Bicycle Delay [s]	33.03	29.43	25.38	32.30
l_b,int, Bicycle LOS Score for Intersection	2.184	2.434	3.536	2.908
Bicycle LOS	B	B	D	C

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 6: Peyton Drive at Woodview Road

Control Type:	All-way stop	Delay (sec / veh):	10.3
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.316

Intersection Setup

Name	Peyton Drive			Peyton Drive			Woodview Road			Woodview Road		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	0	0	1	1	0	0	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			45.00			40.00			35.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			No			No		

Volumes

Name	Peyton Drive			Peyton Drive			Woodview Road			Woodview Road		
Base Volume Input [veh/h]	36	89	3	175	148	68	42	21	21	5	36	108
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	36	89	3	175	148	68	42	21	21	5	36	108
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	9	23	1	46	39	18	11	6	6	1	9	28
Total Analysis Volume [veh/h]	38	94	3	184	156	72	44	22	22	5	38	114
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	539	585	583	634	724	525	598	539	635
Degree of Utilization, x	0.07	0.17	0.32	0.25	0.10	0.08	0.07	0.01	0.24

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	0.23	0.59	1.35	0.96	0.33	0.27	0.24	0.03	0.93
95th-Percentile Queue Length [ft]	5.67	14.78	33.68	24.07	8.25	6.84	5.94	0.70	23.27
Approach Delay [s/veh]	10.03		10.53			9.70		10.13	
Approach LOS	B		B			A		B	
Intersection Delay [s/veh]	10.27								
Intersection LOS	B								

Intersection Level Of Service Report
Intersection 7: Pipeline Avenue at Woodview Road

Control Type:	Two-way stop	Delay (sec / veh):	55.4
Analysis Method:	HCM 7th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.485

Intersection Setup

Name	Pipeline Avenue		Pipeline Avenue		Woodview Road	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	40.00		30.00		35.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name	Pipeline Avenue		Pipeline Avenue		Woodview Road	
Base Volume Input [veh/h]	149	317	410	118	83	164
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	149	317	410	118	83	164
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	39	83	108	31	22	43
Total Analysis Volume [veh/h]	157	334	432	124	87	173
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.15	0.00	0.00	0.00	0.48	0.30
d_M, Delay for Movement [s/veh]	8.74	0.00	0.00	0.00	55.36	41.56
Movement LOS	A	A	A	A	F	E
95th-Percentile Queue Length [veh/ln]	0.29	0.29	0.00	0.00	6.39	6.39
95th-Percentile Queue Length [ft/ln]	7.16	7.16	0.00	0.00	159.68	159.68
d_A, Approach Delay [s/veh]	2.79		0.00		46.18	
Approach LOS	A		A		E	
d_I, Intersection Delay [s/veh]	10.24					
Intersection LOS	F					

Intersection Level Of Service Report
Intersection 8: Pipeline Avenue at Soquel Canyon Parkway

Control Type:	All-way stop	Delay (sec / veh):	30.2
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.919

Intersection Setup

Name	Pipeline Avenue		Soquel Canyon Parkway		Soquel Canyon Parkway	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	1	0	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	40.00		45.00		50.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		No	

Volumes

Name	Pipeline Avenue		Soquel Canyon Parkway		Soquel Canyon Parkway	
Base Volume Input [veh/h]	434	42	27	220	226	435
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	434	42	27	220	226	435
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	114	11	7	58	59	114
Total Analysis Volume [veh/h]	457	44	28	232	238	458
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	546	438	468	468	468	500	500	559
Degree of Utilization, x	0.92	0.06	0.17	0.17	0.17	0.24	0.24	0.82

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	11.23	0.20	0.59	0.59	0.59	0.92	0.92	8.25
95th-Percentile Queue Length [ft]	280.68	5.10	14.67	14.67	14.67	22.96	22.96	206.22
Approach Delay [s/veh]	46.76	11.86				25.22		
Approach LOS	E	B				D		
Intersection Delay [s/veh]	30.25							
Intersection LOS	D							

Intersection Level Of Service Report

Intersection 9: Soquel Canyon Parkway at Los Serranos Country Club Drive/Butterfield Ranch Road

Control Type:	Signalized	Delay (sec / veh):	35.0
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.565

Intersection Setup

Name	Soquel Canyon Parkway			Soquel Canyon Parkway			Lo Se			Butterfield Ranch Road		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	0	1	0	0	1	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Soquel Canyon Parkway			Soquel Canyon Parkway			Lo Se			Butterfield Ranch Road		
Base Volume Input [veh/h]	38	515	157	367	851	250	407	271	41	222	176	317
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	38	515	157	367	851	250	407	271	41	222	176	317
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	10	136	41	97	224	66	107	71	11	58	46	83
Total Analysis Volume [veh/h]	40	542	165	386	896	263	428	285	43	234	185	334
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Overlap
Signal Group	1	6	0	5	2	0	3	8	0	7	4	4
Auxiliary Signal Groups												4,5
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	6
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	30
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	3.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	1.0
Split [s]	26	39	0	20	33	0	22	39	0	22	39	39
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	3.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	7
Pedestrian Clearance [s]	0	28	0	0	18	0	0	28	0	0	28	28
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	2.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	2.0
Minimum Recall	No	No		No	No		No	No		No	No	No
Maximum Recall	No	No		No	No		No	No		No	No	No
Pedestrian Recall	No	No		No	No		No	No		No	No	No
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	C	L	C	C	L	C	R
C, Cycle Length [s]	120	120	120	120	120	120	120	120	120	120	120	120
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	0.00
g_i, Effective Green Time [s]	4	55	55	16	66	66	18	22	22	11	15	35
g / C, Green / Cycle	0.04	0.46	0.46	0.13	0.55	0.55	0.15	0.18	0.18	0.09	0.13	0.29
(v / s)_i Volume / Saturation Flow Rate	0.02	0.13	0.13	0.12	0.22	0.20	0.13	0.09	0.09	0.07	0.10	0.09
s, saturation flow rate [veh/h]	1700	3600	1800	3200	3600	1800	3200	1800	1800	3200	1800	3600
c, Capacity [veh/h]	64	1644	822	428	1990	995	476	332	332	294	230	1060
d1, Uniform Delay [s]	56.93	20.44	20.31	51.23	15.39	15.11	50.20	44.03	43.84	53.40	50.93	32.93
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	9.54	0.45	0.84	7.20	0.59	1.06	6.35	1.19	1.09	4.88	6.55	0.17
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.62	0.29	0.28	0.90	0.40	0.37	0.90	0.50	0.48	0.80	0.81	0.31
d, Delay for Lane Group [s/veh]	66.47	20.89	21.15	58.43	15.99	16.17	56.55	45.22	44.93	58.28	57.48	33.10
Lane Group LOS	E	C	C	E	B	B	E	D	D	E	E	C
Critical Lane Group	No	Yes	No	Yes	No	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	1.37	4.30	4.18	6.14	6.24	5.86	6.72	4.60	4.38	3.66	5.82	3.83
50th-Percentile Queue Length [ft/ln]	34.17	107.41	104.57	153.38	156.04	146.54	167.99	115.07	109.54	91.45	145.55	95.65
95th-Percentile Queue Length [veh/ln]	2.46	7.70	7.53	10.20	10.34	9.83	10.97	8.12	7.81	6.58	9.78	6.89
95th-Percentile Queue Length [ft/ln]	61.50	192.39	188.23	254.94	258.47	245.80	274.28	203.03	195.36	164.62	244.48	172.16

Movement, Approach, & Intersection Results

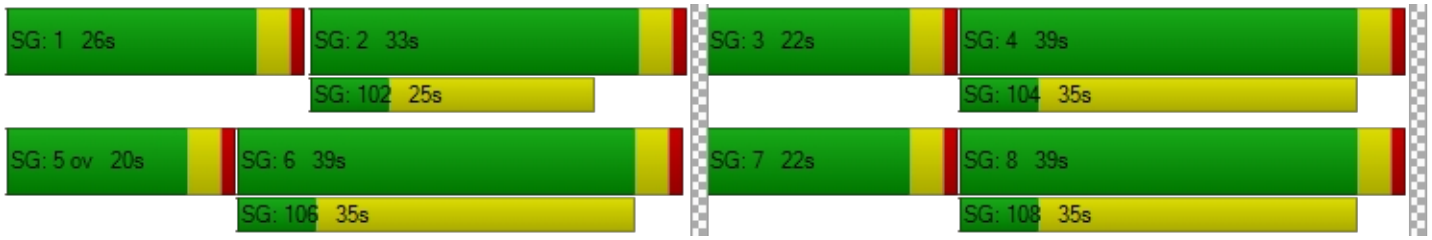
d_M, Delay for Movement [s/veh]	66.47	20.92	21.15	58.43	16.01	16.17	56.55	45.10	44.93	58.28	57.48	33.10
Movement LOS	E	C	C	E	B	B	E	D	D	E	E	C
d_A, Approach Delay [s/veh]	23.41			26.63			51.57			46.91		
Approach LOS	C			C			D			D		
d_I, Intersection Delay [s/veh]	34.98											
Intersection LOS	C											
Intersection V/C	0.565											

Other Modes

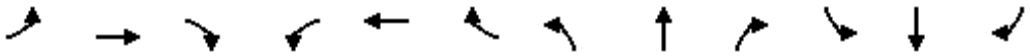
g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	49.52	49.52	49.52	49.52
l_p,int, Pedestrian LOS Score for Intersection	2.875	3.086	2.556	2.933
Crosswalk LOS	C	C	B	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	583	483	583	583
d_b, Bicycle Delay [s]	30.12	34.52	30.12	30.12
l_b,int, Bicycle LOS Score for Intersection	1.970	2.409	2.183	2.802
Bicycle LOS	A	B	B	C

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



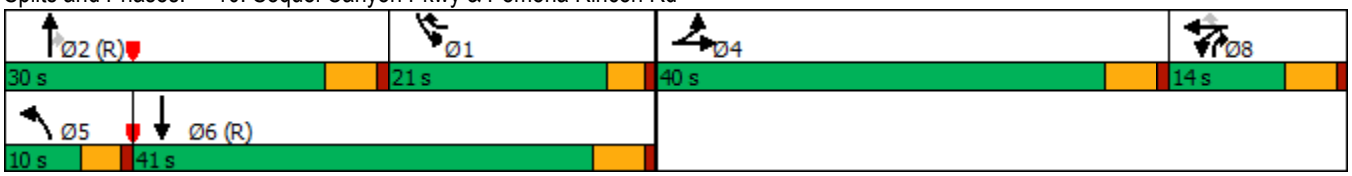
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	69	30	11	168	4	467	32	956	279	714	1269	69
Future Volume (vph)	69	30	11	168	4	467	32	956	279	714	1269	69
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	0.95	0.91	0.95	1.00	0.86	0.86	0.97	0.91	0.91
Frt		0.960			0.863	0.850		0.996	0.850		0.992	
Flt Protected	0.950			0.950	0.997		0.950			0.950		
Satd. Flow (prot)	1770	1788	0	1681	1458	1504	1770	4787	1362	3433	5045	0
Flt Permitted	0.950			0.950	0.997		0.950			0.950		
Satd. Flow (perm)	1770	1788	0	1681	1458	1504	1770	4787	1362	3433	5045	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		12			249	270		4	279		9	
Link Speed (mph)		25			25			50			50	
Link Distance (ft)		560			625			594			526	
Travel Time (s)		15.3			17.0			8.1			7.2	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	77	33	12	187	4	519	36	1062	310	793	1410	77
Shared Lane Traffic (%)				10%		48%			10%			
Lane Group Flow (vph)	77	45	0	168	272	270	36	1093	279	793	1487	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2	1	1	2	1	1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100		20	100	20	20	100	20	20	100	
Trailing Detector (ft)	0	0		0	0	0	0	0	0	0	0	
Detector 1 Position(ft)	0	0		0	0	0	0	0	0	0	0	
Detector 1 Size(ft)	20	6		20	6	20	20	6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Split	NA		Split	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	
Protected Phases	4	4		8	8	1	5	2	8	1	6	
Permitted Phases						8			2			
Detector Phase	4	4		8	8	1	5	2	8	1	6	
Switch Phase												
Minimum Initial (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	

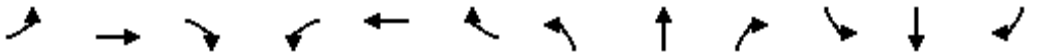


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Split (s)	40.0	40.0		11.0	11.0	10.0	10.0	30.0	11.0	10.0	23.0	
Total Split (s)	40.0	40.0		14.0	14.0	21.0	10.0	30.0	14.0	21.0	41.0	
Total Split (%)	38.1%	38.1%		13.3%	13.3%	20.0%	9.5%	28.6%	13.3%	20.0%	39.0%	
Maximum Green (s)	35.0	35.0		9.0	9.0	17.0	6.0	25.0	9.0	17.0	36.0	
Yellow Time (s)	4.0	4.0		4.0	4.0	3.0	3.0	4.0	4.0	3.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0	4.0	4.0	5.0	5.0	4.0	5.0	
Lead/Lag						Lag	Lead	Lead		Lag	Lag	
Lead-Lag Optimize?						Yes	Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	None		None	None	None	None	C-Max	None	None	C-Max	
Walk Time (s)	7.0	7.0						7.0			7.0	
Flash Dont Walk (s)	28.0	28.0						18.0			11.0	
Pedestrian Calls (#/hr)	5	5						5			5	
Act Effct Green (s)	14.2	14.2		19.3	19.3	38.1	6.9	37.7	62.0	17.0	51.9	
Actuated g/C Ratio	0.14	0.14		0.18	0.18	0.36	0.07	0.36	0.59	0.16	0.49	
v/c Ratio	0.32	0.18		0.54	0.58	0.38	0.31	0.63	0.30	1.43	0.60	
Control Delay	41.2	29.1		48.4	13.1	3.4	54.0	31.9	3.3	237.4	23.1	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	41.2	29.1		48.4	13.1	3.4	54.0	31.9	3.3	237.4	23.1	
LOS	D	C		D	B	A	D	C	A	F	C	
Approach Delay		36.7			17.8			26.8			97.6	
Approach LOS		D			B			C			F	
Queue Length 50th (ft)	50	21		105	14	0	23	234	0	~372	279	
Queue Length 95th (ft)	71	41		#283	#145	34	58	#380	61	#492	398	
Internal Link Dist (ft)		480			545			514			446	
Turn Bay Length (ft)												
Base Capacity (vph)	590	604		309	471	718	116	1722	918	555	2498	
Starvation Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.13	0.07		0.54	0.58	0.38	0.31	0.63	0.30	1.43	0.60	

Intersection Summary			
Area Type:	Other		
Cycle Length: 105			
Actuated Cycle Length: 105			
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green			
Natural Cycle: 115			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.43			
Intersection Signal Delay: 61.4		Intersection LOS: E	
Intersection Capacity Utilization 71.3%		ICU Level of Service C	
Analysis Period (min) 15			
~ Volume exceeds capacity, queue is theoretically infinite.			
Queue shown is maximum after two cycles.			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 10: Soquel Canyon Pkwy & Pomona Rincon Rd





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	69	30	11	168	4	467	32	956	279	714	1269	69
Future Volume (veh/h)	69	30	11	168	4	467	32	956	279	714	1269	69
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	77	33	12	126	0	587	36	1062	310	793	1410	77
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	113	83	30	153	0	1610	66	1336	513	1458	3134	171
Arrive On Green	0.06	0.06	0.06	0.09	0.00	0.09	0.04	0.24	0.24	0.42	0.63	0.63
Sat Flow, veh/h	1781	1309	476	1781	0	3170	1781	5611	1585	3456	4955	271
Grp Volume(v), veh/h	77	0	45	126	0	587	36	1062	310	793	969	518
Grp Sat Flow(s),veh/h/ln	1781	0	1785	1781	0	1585	1781	1870	1585	1728	1702	1822
Q Serve(g_s), s	4.4	0.0	2.5	7.3	0.0	0.0	2.1	18.7	17.3	18.1	15.3	15.3
Cycle Q Clear(g_c), s	4.4	0.0	2.5	7.3	0.0	0.0	2.1	18.7	17.3	18.1	15.3	15.3
Prop In Lane	1.00		0.27	1.00		1.00	1.00		1.00	1.00		0.15
Lane Grp Cap(c), veh/h	113	0	114	153	0	1610	66	1336	513	1458	2153	1152
V/C Ratio(X)	0.68	0.00	0.40	0.83	0.00	0.36	0.54	0.79	0.60	0.54	0.45	0.45
Avail Cap(c_a), veh/h	594	0	595	153	0	1610	102	1336	513	1458	2153	1152
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	48.1	0.0	47.2	47.2	0.0	15.6	49.7	37.6	29.8	22.8	9.9	9.9
Incr Delay (d2), s/veh	6.9	0.0	2.2	29.4	0.0	0.1	6.8	5.0	5.2	0.4	0.7	1.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.2	0.0	1.2	4.5	0.0	4.2	1.0	8.7	7.8	6.8	4.9	5.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	55.0	0.0	49.4	76.6	0.0	15.8	56.5	42.5	35.0	23.2	10.6	11.2
LnGrp LOS	E	A	D	E	A	B	E	D	D	C	B	B
Approach Vol, veh/h		122			713			1408			2280	
Approach Delay, s/veh		53.0			26.5			41.2			15.1	
Approach LOS		D			C			D			B	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	49.3	30.0		11.7	7.9	71.4		14.0				
Change Period (Y+Rc), s	5.0	* 5		5.0	4.0	5.0		5.0				
Max Green Setting (Gmax), s	17.0	* 25		35.0	6.0	36.0		9.0				
Max Q Clear Time (g_c+I1), s	20.1	20.7		6.4	4.1	17.3		9.3				
Green Ext Time (p_c), s	0.0	2.8		0.4	0.0	9.0		0.0				

Intersection Summary			
HCM 6th Ctrl Delay		26.1	
HCM 6th LOS		C	

Notes

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection Level Of Service Report
Intersection 11: Peyton Drive at Grand Avenue

Control Type:	Signalized	Delay (sec / veh):	39.5
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.656

Intersection Setup

Name	Peyton Drive			Peyton Drive			Grand Avenue			Grand Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	1	0	0	1	0	1	1	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Peyton Drive			Peyton Drive			Grand Avenue			Grand Avenue		
Base Volume Input [veh/h]	139	694	185	248	700	171	349	880	167	283	447	277
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	139	694	185	248	700	171	349	880	167	283	447	277
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	37	183	49	65	184	45	92	232	44	74	118	73
Total Analysis Volume [veh/h]	146	731	195	261	737	180	367	926	176	298	471	292
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	1	6	0	5	2	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	13	39	0	15	41	0	27	49	0	17	39	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	28	0	0	24	0	0	31	0	0	28	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	C	L	C	R	L	C	R
C, Cycle Length [s]	120	120	120	120	120	120	120	120	120	120	120	120
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	7	45	45	11	49	49	16	35	35	13	31	31
g / C, Green / Cycle	0.06	0.38	0.38	0.09	0.41	0.41	0.13	0.29	0.29	0.11	0.26	0.26
(v / s)_i Volume / Saturation Flow Rate	0.05	0.14	0.11	0.08	0.17	0.16	0.11	0.26	0.10	0.09	0.13	0.16
s, saturation flow rate [veh/h]	3200	5400	1800	3200	3600	1800	3200	3600	1800	3200	3600	1800
c, Capacity [veh/h]	199	2042	681	295	1469	735	432	1036	518	348	942	471
d1, Uniform Delay [s]	55.33	26.85	26.04	53.86	25.41	25.16	50.75	41.01	33.76	52.58	37.66	39.07
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	5.17	0.49	1.06	8.64	0.89	1.64	4.78	2.98	0.39	6.10	0.41	1.34
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.73	0.36	0.29	0.88	0.42	0.40	0.85	0.89	0.34	0.86	0.50	0.62
d, Delay for Lane Group [s/veh]	60.50	27.34	27.10	62.50	26.31	26.80	55.54	43.99	34.15	58.68	38.08	40.41
Lane Group LOS	E	C	C	E	C	C	E	D	C	E	D	D
Critical Lane Group	Yes	No	No	No	Yes	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	2.31	5.12	4.10	4.25	6.50	6.29	5.67	13.44	4.13	4.70	5.94	7.75
50th-Percentile Queue Length [ft/ln]	57.87	127.96	102.50	106.15	162.51	157.24	141.73	335.92	103.16	117.61	148.61	193.81
95th-Percentile Queue Length [veh/ln]	4.17	8.83	7.38	7.63	10.68	10.40	9.57	19.45	7.43	8.26	9.94	12.32
95th-Percentile Queue Length [ft/ln]	104.17	220.72	184.51	190.64	267.05	260.07	239.35	486.21	185.68	206.54	248.57	307.97

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	60.50	27.34	27.10	62.50	26.38	26.80	55.54	43.99	34.15	58.68	38.08	40.41
Movement LOS	E	C	C	E	C	C	E	D	C	E	D	D
d_A, Approach Delay [s/veh]	31.81			34.45			45.70			44.51		
Approach LOS	C			C			D			D		
d_I, Intersection Delay [s/veh]	39.55											
Intersection LOS	D											
Intersection V/C	0.656											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	49.52	49.52	49.52	49.52
l_p,int, Pedestrian LOS Score for Intersection	3.110	3.052	2.923	3.037
Crosswalk LOS	C	C	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	583	617	750	583
d_b, Bicycle Delay [s]	30.12	28.72	23.45	30.12
l_b,int, Bicycle LOS Score for Intersection	2.149	2.208	2.772	2.435
Bicycle LOS	B	B	C	B

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 12: Carbon Canyon Road at Fairway Drive/Ginseng Lane

Control Type:	Two-way stop	Delay (sec / veh):	757.5
Analysis Method:	HCM 7th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.736

Intersection Setup

Name	Carbon Canyon Road			Carbon Canyon Road			Fairway Drive			Ginseng Lane		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	0	0	0	1	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	45.00			45.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			No			No		

Volumes

Name	Carbon Canyon Road			Carbon Canyon Road			Fairway Drive			Ginseng Lane		
Base Volume Input [veh/h]	28	1583	4	9	639	37	33	0	26	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	28	1583	4	9	639	37	33	0	26	0	0	0
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	7	417	1	2	168	10	9	0	7	0	0	0
Total Analysis Volume [veh/h]	29	1666	4	9	673	39	35	0	27	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Free	Free	Stop	Stop
Flared Lane				No
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance			No	No
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.03	0.02	0.00	0.02	0.01	0.00	1.74	0.00	0.06	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	9.19	0.00	0.00	14.59	0.00	0.00	757.47	701.73	13.64	199.42	131.00	35.24
Movement LOS	A	A	A	B	A	A	F	F	B	F	F	E
95th-Percentile Queue Length [veh/ln]	0.10	0.00	0.00	0.07	0.00	0.00	4.67	4.67	0.19	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	2.53	0.00	0.00	1.80	0.00	0.00	116.67	116.67	4.84	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	0.16			0.18			433.55			121.89		
Approach LOS	A			A			F			F		
d_I, Intersection Delay [s/veh]	10.99											
Intersection LOS	F											

Intersection Level Of Service Report
Intersection 13: Carbon Canyon Road at Canyon Hills Road

Control Type:	Two-way stop	Delay (sec / veh):	261.0
Analysis Method:	HCM 7th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.968

Intersection Setup

Name	Carbon Canyon Road		Carbon Canyon Road		Canyon Hills Road	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	45.00		45.00		25.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name	Carbon Canyon Road		Carbon Canyon Road		Canyon Hills Road	
Base Volume Input [veh/h]	26	1591	547	57	36	30
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	26	1591	547	57	36	30
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	7	419	144	15	9	8
Total Analysis Volume [veh/h]	27	1675	576	60	38	32
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.03	0.02	0.01	0.00	0.97	0.06
d_M, Delay for Movement [s/veh]	8.91	0.00	0.00	0.00	261.05	176.62
Movement LOS	A	A	A	A	F	F
95th-Percentile Queue Length [veh/ln]	0.09	0.00	0.00	0.00	5.26	5.26
95th-Percentile Queue Length [ft/ln]	2.20	0.00	0.00	0.00	131.53	131.53
d_A, Approach Delay [s/veh]	0.14		0.00		222.45	
Approach LOS	A		A		F	
d_I, Intersection Delay [s/veh]	6.57					
Intersection LOS	F					

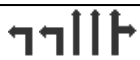
APPENDIX E-III

YEAR 2029 WITH PROJECT WITH MITIGATION TRAFFIC CONDITIONS

Intersection Level Of Service Report
Intersection 2: Gateway Village/Boys Republic Drive at Grand Avenue

Control Type:	Signalized	Delay (sec / veh):	27.1
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.620

Intersection Setup

Name	Boys Republic Drive			Gateway Village			Grand Avenue			Grand Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	1	1	0	0	1	0	0	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			No		

Volumes

Name	Boys Republic Drive			Gateway Village			Grand Avenue			Grand Avenue		
Base Volume Input [veh/h]	55	29	485	88	35	35	55	662	16	543	952	82
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	55	29	485	88	35	35	55	662	16	543	952	82
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	14	8	128	23	9	9	14	174	4	143	251	22
Total Analysis Volume [veh/h]	58	31	511	93	37	37	58	697	17	572	1002	86
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Split	Split	Overlap	Split	Split	Split	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	0	8	8	0	4	0	5	2	0	1	6	0
Auxiliary Signal Groups			1,8									
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	0	6	6	0	6	0	6	6	0	6	6	0
Maximum Green [s]	0	30	30	0	30	0	30	30	0	30	30	0
Amber [s]	0.0	3.0	3.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	1.0	1.0	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	10	10	0	35	0	10	25	0	40	55	0
Vehicle Extension [s]	0.0	3.0	3.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	0	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	24	0	0	14	0	0	11	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	2.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	2.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall		No	No		No		No	No		No	No	
Maximum Recall		No	No		No		No	No		No	No	
Pedestrian Recall		No	No		No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	R	L	C	L	C	C	L	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	14	42	8	8	5	48	48	24	67	67
g / C, Green / Cycle	0.13	0.38	0.07	0.07	0.05	0.44	0.44	0.22	0.61	0.61
(v / s)_i Volume / Saturation Flow Rate	0.05	0.28	0.05	0.05	0.03	0.13	0.14	0.18	0.20	0.20
s, saturation flow rate [veh/h]	1700	1800	1700	1700	1700	3600	1800	3200	3600	1800
c, Capacity [veh/h]	220	691	119	119	79	1573	787	697	2191	1095
d1, Uniform Delay [s]	44.01	29.19	50.07	50.03	51.85	20.07	20.19	41.01	10.55	10.58
k, delay calibration	0.11	0.36	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.19	5.12	7.41	7.00	12.60	0.49	1.03	2.48	0.40	0.82
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.40	0.74	0.71	0.69	0.74	0.30	0.31	0.82	0.33	0.33
d, Delay for Lane Group [s/veh]	45.20	34.31	57.49	57.03	64.45	20.55	21.22	43.49	10.96	11.40
Lane Group LOS	D	C	E	E	E	C	C	D	B	B
Critical Lane Group	No	Yes	Yes	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	2.30	12.37	2.51	2.45	1.85	3.97	4.27	7.57	4.22	4.39
50th-Percentile Queue Length [ft/ln]	57.52	309.27	62.79	61.34	46.34	99.27	106.75	189.13	105.53	109.87
95th-Percentile Queue Length [veh/ln]	4.14	18.14	4.52	4.42	3.34	7.15	7.66	12.08	7.59	7.83
95th-Percentile Queue Length [ft/ln]	103.53	453.48	113.02	110.42	83.41	178.69	191.48	301.90	189.77	195.82

Movement, Approach, & Intersection Results

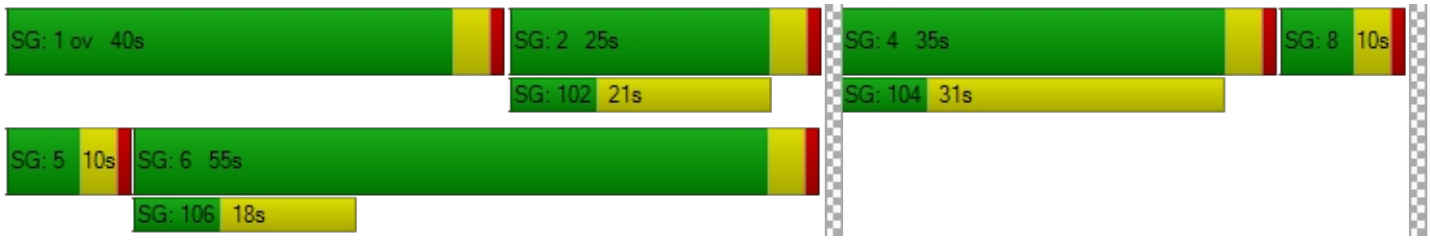
d_M, Delay for Movement [s/veh]	45.20	45.20	34.31	57.44	57.03	57.03	64.45	20.77	21.22	43.49	11.08	11.40
Movement LOS	D	D	C	E	E	E	E	C	C	D	B	B
d_A, Approach Delay [s/veh]	35.93			57.26			24.06			22.26		
Approach LOS	D			E			C			C		
d_I, Intersection Delay [s/veh]	27.09											
Intersection LOS	C											
Intersection V/C	0.620											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	0.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	44.58	44.58	44.58	0.00
l_p,int, Pedestrian LOS Score for Intersection	2.439	2.061	2.864	0.000
Crosswalk LOS	B	B	C	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	109	563	382	927
d_b, Bicycle Delay [s]	49.19	28.39	36.03	15.84
l_b,int, Bicycle LOS Score for Intersection	2.550	1.835	1.984	2.473
Bicycle LOS	B	A	A	B

Sequence

Ring 1	1	2	4	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 5: Peyton Drive at Chino Hills Parkway

Control Type:	Signalized	Delay (sec / veh):	38.5
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.856

Intersection Setup

Name	Peyton Drive			Peyton Drive			Chino Hills Parkway			Chino Hills Parkway		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	1	1	0	1	1	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Peyton Drive			Peyton Drive			Chino Hills Parkway			Chino Hills Parkway		
Base Volume Input [veh/h]	604	393	292	192	214	336	187	540	148	200	1103	273
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	604	393	292	192	214	336	187	540	148	200	1103	273
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	159	103	77	51	56	88	49	142	39	53	290	72
Total Analysis Volume [veh/h]	636	414	307	202	225	354	197	568	156	211	1161	287
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Overlap	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	3	8	0	7	4	4	5	2	0	1	6	0
Auxiliary Signal Groups						4,5						
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	6	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	30	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	1.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	27	35	0	28	36	36	12	32	0	15	35	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	7	0	7	0	0	7	0
Pedestrian Clearance [s]	0	24	0	0	24	24	0	21	0	0	24	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No	No	No	No		No	No	
Maximum Recall	No	No		No	No	No	No	No		No	No	
Pedestrian Recall	No	No		No	No	No	No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	R	L	C	R	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	23	26	26	9	12	24	8	49	49	9	51	51
g / C, Green / Cycle	0.21	0.24	0.24	0.08	0.11	0.22	0.07	0.45	0.45	0.08	0.46	0.46
(v / s)_i Volume / Saturation Flow Rate	0.20	0.21	0.19	0.06	0.07	0.21	0.06	0.16	0.09	0.07	0.32	0.16
s, saturation flow rate [veh/h]	3200	1800	1800	3400	3400	1700	3200	3600	1800	3200	3600	1800
c, Capacity [veh/h]	669	434	434	276	384	378	235	1614	807	270	1653	827
d1, Uniform Delay [s]	42.97	40.30	39.04	49.43	46.40	42.02	50.36	19.90	18.35	49.40	23.76	19.15
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.25	0.11	0.50	0.50	0.11	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	8.14	6.12	3.06	3.76	1.43	20.04	7.75	0.60	0.53	4.89	2.52	1.15
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.95	0.88	0.78	0.73	0.59	0.94	0.84	0.35	0.19	0.78	0.70	0.35
d, Delay for Lane Group [s/veh]	51.12	46.42	42.10	53.19	47.83	62.06	58.11	20.50	18.88	54.29	26.28	20.30
Lane Group LOS	D	D	D	D	D	E	E	C	B	D	C	C
Critical Lane Group	Yes	No	No	No	No	Yes	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	9.21	10.64	8.82	2.85	3.00	11.46	2.92	4.84	2.50	3.02	12.25	4.91
50th-Percentile Queue Length [ft/ln]	230.19	265.98	220.42	71.30	74.95	286.39	73.11	121.02	62.58	75.50	306.16	122.86
95th-Percentile Queue Length [veh/ln]	14.18	15.99	13.69	5.13	5.40	17.01	5.26	8.45	4.51	5.44	17.99	8.55
95th-Percentile Queue Length [ft/ln]	354.60	399.71	342.16	128.34	134.91	425.16	131.60	211.23	112.64	135.90	449.64	213.75

Movement, Approach, & Intersection Results

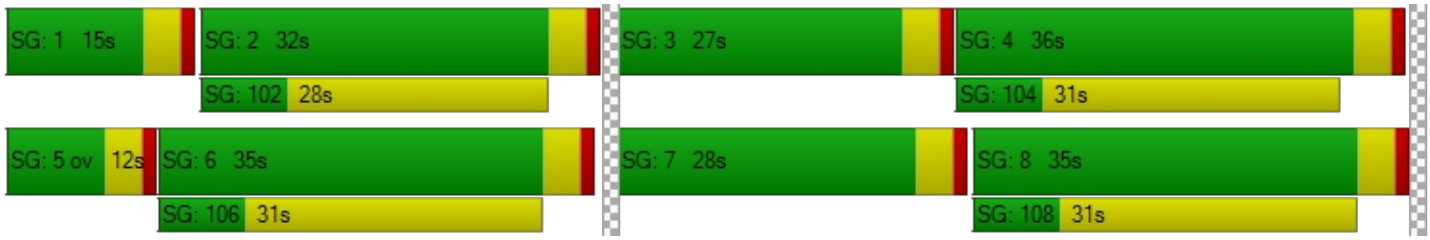
d_M, Delay for Movement [s/veh]	51.12	46.10	42.10	53.19	47.83	62.06	58.11	20.50	18.88	54.29	26.28	20.30
Movement LOS	D	D	D	D	D	E	E	C	B	D	C	C
d_A, Approach Delay [s/veh]	47.55			55.67			28.27			28.81		
Approach LOS	D			E			C			C		
d_I, Intersection Delay [s/veh]	38.54											
Intersection LOS	D											
Intersection V/C	0.856											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	44.58	44.58	44.58	44.58
l_p,int, Pedestrian LOS Score for Intersection	2.779	2.837	3.031	2.985
Crosswalk LOS	C	C	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	563	582	509	563
d_b, Bicycle Delay [s]	28.39	27.68	30.59	28.39
l_b,int, Bicycle LOS Score for Intersection	2.679	2.204	2.319	2.928
Bicycle LOS	B	B	B	C

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 7: Pipeline Avenue at Woodview Road

Control Type:	Signalized	Delay (sec / veh):	23.9
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.601

Intersection Setup

Name	Pipeline Avenue		Pipeline Avenue		Woodview Road	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	40.00		30.00		35.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	No		No		No	
Crosswalk	Yes		No		Yes	

Volumes

Name	Pipeline Avenue		Pipeline Avenue		Woodview Road	
Base Volume Input [veh/h]	204	403	280	55	116	204
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00					
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	204	403	280	55	116	204
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	54	106	74	14	31	54
Total Analysis Volume [veh/h]	215	424	295	58	122	215
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0		0		0	
v_di, Inbound Pedestrian Volume crossing m	0		0		0	
v_co, Outbound Pedestrian Volume crossing	0		0		0	
v_ci, Inbound Pedestrian Volume crossing mi	0		0		0	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Protected	Permissive	Permissive	Permissive	Permissive	Permissive
Signal Group	1	6	2	0	3	0
Auxiliary Signal Groups						
Lead / Lag	Lead	-	-	-	Lead	-
Minimum Green [s]	6	6	6	0	6	0
Maximum Green [s]	30	30	30	0	30	0
Amber [s]	3.0	3.0	3.0	0.0	3.0	0.0
All red [s]	1.0	1.0	1.0	0.0	1.0	0.0
Split [s]	22	40	18	0	50	0
Vehicle Extension [s]	3.0	3.0	3.0	0.0	3.0	0.0
Walk [s]	0	0	7	0	7	0
Pedestrian Clearance [s]	0	0	7	0	11	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No	No		No	
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	2.0	0.0	2.0	0.0
Minimum Recall	No	No	No		No	
Maximum Recall	No	No	No		No	
Pedestrian Recall	No	No	No		No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	C
C, Cycle Length [s]	90	90	90	90
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	13	62	45	20
g / C, Green / Cycle	0.15	0.69	0.50	0.22
(v / s)_i Volume / Saturation Flow Rate	0.13	0.24	0.20	0.20
s, saturation flow rate [veh/h]	1700	1800	1800	1700
c, Capacity [veh/h]	251	1236	891	381
d1, Uniform Delay [s]	37.43	5.77	14.30	33.80
k, delay calibration	0.11	0.50	0.50	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	8.16	0.76	1.32	6.88
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.86	0.34	0.40	0.88
d, Delay for Lane Group [s/veh]	45.59	6.53	15.62	40.67
Lane Group LOS	D	A	B	D
Critical Lane Group	Yes	No	Yes	Yes
50th-Percentile Queue Length [veh/ln]	4.99	2.75	4.60	7.58
50th-Percentile Queue Length [ft/ln]	124.86	68.73	115.11	189.41
95th-Percentile Queue Length [veh/ln]	8.66	4.95	8.12	12.09
95th-Percentile Queue Length [ft/ln]	216.49	123.71	203.08	302.27

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	45.59	6.53	15.62	15.62	40.67	40.67
Movement LOS	D	A	B	B	D	D
d_A, Approach Delay [s/veh]	19.67		15.62		40.67	
Approach LOS	B		B		D	
d_I, Intersection Delay [s/veh]	23.92					
Intersection LOS	C					
Intersection V/C	0.601					

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	0.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	34.68	0.00	34.68
l_p,int, Pedestrian LOS Score for Intersection	2.438	0.000	2.061
Crosswalk LOS	B	F	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	800	311	1022
d_b, Bicycle Delay [s]	16.21	32.10	10.76
l_b,int, Bicycle LOS Score for Intersection	2.614	2.142	2.116
Bicycle LOS	B	B	B

Sequence

Ring 1	1	2	3	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 2: Gateway Village/Boys Republic Drive at Grand Avenue

Control Type:	Signalized	Delay (sec / veh):	44.3
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.972

Intersection Setup

Name	Boys Republic Drive			Gateway Village			Grand Avenue			Grand Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	1	1	0	0	1	0	0	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			No		

Volumes

Name	Boys Republic Drive			Gateway Village			Grand Avenue			Grand Avenue		
Base Volume Input [veh/h]	36	34	715	276	54	73	115	1192	61	837	1212	133
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	36	34	715	276	54	73	115	1192	61	837	1212	133
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	9	9	188	73	14	19	30	314	16	220	319	35
Total Analysis Volume [veh/h]	38	36	753	291	57	77	121	1255	64	881	1276	140
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Split	Split	Overlap	Split	Split	Split	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	0	8	8	0	4	0	5	2	0	1	6	0
Auxiliary Signal Groups			1,8									
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	0	6	6	0	6	0	6	6	0	6	6	0
Maximum Green [s]	0	30	30	0	30	0	30	30	0	30	30	0
Amber [s]	0.0	3.0	3.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	1.0	1.0	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	10	10	0	35	0	14	35	0	40	61	0
Vehicle Extension [s]	0.0	3.0	3.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	0	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	24	0	0	14	0	0	11	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	2.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	2.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall		No	No		No		No	No		No	No	
Maximum Recall		No	No		No		No	No		No	No	
Pedestrian Recall		No	No		No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	R	L	C	L	C	C	L	C	C
C, Cycle Length [s]	120	120	120	120	120	120	120	120	120	120
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	19	58	18	18	10	32	32	35	57	57
g / C, Green / Cycle	0.16	0.49	0.15	0.15	0.08	0.26	0.26	0.29	0.48	0.48
(v / s)_i Volume / Saturation Flow Rate	0.04	0.42	0.13	0.12	0.07	0.24	0.25	0.28	0.26	0.26
s, saturation flow rate [veh/h]	1700	1800	1700	1700	1700	3600	1800	3200	3600	1800
c, Capacity [veh/h]	270	876	252	252	142	955	478	943	1714	857
d1, Uniform Delay [s]	44.41	27.20	49.88	49.66	54.26	42.75	43.09	41.22	22.28	22.40
k, delay calibration	0.11	0.50	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.54	10.77	8.18	6.95	13.07	14.46	27.88	5.04	1.26	2.60
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.27	0.86	0.86	0.83	0.85	0.91	0.94	0.93	0.55	0.56
d, Delay for Lane Group [s/veh]	44.96	37.97	58.06	56.61	67.33	57.21	70.97	46.26	23.54	24.99
Lane Group LOS	D	D	E	E	E	E	E	D	C	C
Critical Lane Group	No	Yes	Yes	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	1.99	21.02	6.88	6.58	4.12	14.37	16.55	13.20	9.57	10.08
50th-Percentile Queue Length [ft/ln]	49.64	525.40	171.93	164.39	103.03	359.16	413.84	330.09	239.35	252.06
95th-Percentile Queue Length [veh/ln]	3.57	28.53	11.18	10.78	7.42	20.58	23.23	19.16	14.65	15.29
95th-Percentile Queue Length [ft/ln]	89.36	713.35	279.45	269.53	185.45	514.56	580.65	479.07	366.22	382.25

Movement, Approach, & Intersection Results

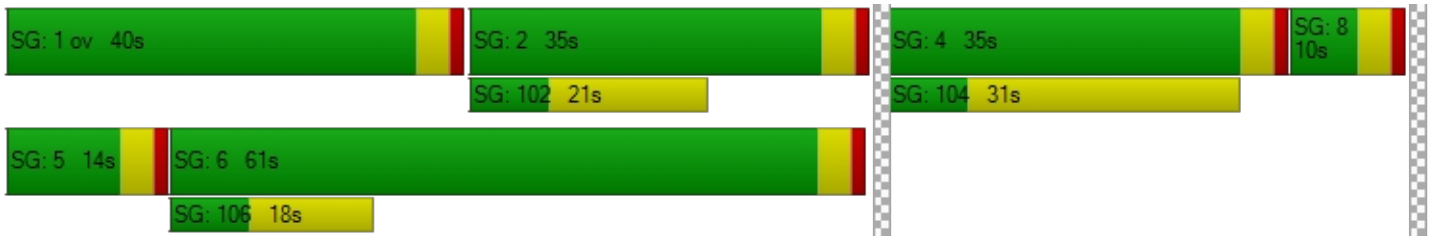
d_M, Delay for Movement [s/veh]	44.96	44.96	37.97	57.67	56.61	56.61	67.33	61.41	70.97	46.26	23.92	24.99
Movement LOS	D	D	D	E	E	E	E	E	E	D	C	C
d_A, Approach Delay [s/veh]	38.60			57.34			62.33			32.56		
Approach LOS	D			E			E			C		
d_I, Intersection Delay [s/veh]	44.26											
Intersection LOS	D											
Intersection V/C	0.972											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	0.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	49.51	49.51	49.51	0.00
l_p,int, Pedestrian LOS Score for Intersection	2.591	2.189	3.002	0.000
Crosswalk LOS	B	B	C	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	100	517	517	950
d_b, Bicycle Delay [s]	54.16	33.01	33.01	16.54
l_b,int, Bicycle LOS Score for Intersection	2.924	2.261	2.352	2.823
Bicycle LOS	C	B	B	C

Sequence

Ring 1	1	2	4	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 5: Peyton Drive at Chino Hills Parkway

Control Type:	Signalized	Delay (sec / veh):	40.5
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.867

Intersection Setup

Name	Peyton Drive			Peyton Drive			Chino Hills Parkway			Chino Hills Parkway		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	1	1	0	1	1	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Peyton Drive			Peyton Drive			Chino Hills Parkway			Chino Hills Parkway		
Base Volume Input [veh/h]	230	286	203	383	427	198	399	1347	530	261	955	336
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	230	286	203	383	427	198	399	1347	530	261	955	336
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	61	75	53	101	112	52	105	354	139	69	251	88
Total Analysis Volume [veh/h]	242	301	214	403	449	208	420	1418	558	275	1005	354
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Overlap	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	3	8	0	7	4	4	5	2	0	1	6	0
Auxiliary Signal Groups						4,5						
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	6	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	30	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	1.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	19	35	0	19	35	35	26	51	0	15	40	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	7	0	7	0	0	7	0
Pedestrian Clearance [s]	0	24	0	0	24	24	0	21	0	0	24	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No	No	No	No		No	No	
Maximum Recall	No	No		No	No	No	No	No		No	No	
Pedestrian Recall	No	No		No	No	No	No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	R	L	C	R	L	C	R
C, Cycle Length [s]	120	120	120	120	120	120	120	120	120	120	120	120
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	11	21	21	15	25	47	18	57	57	11	50	50
g / C, Green / Cycle	0.09	0.17	0.17	0.13	0.21	0.39	0.15	0.47	0.47	0.09	0.41	0.41
(v / s)_i Volume / Saturation Flow Rate	0.08	0.15	0.13	0.12	0.13	0.12	0.13	0.39	0.31	0.09	0.28	0.20
s, saturation flow rate [veh/h]	3200	1800	1800	3400	3400	1700	3200	3600	1800	3200	3600	1800
c, Capacity [veh/h]	299	315	315	426	703	668	489	1708	854	295	1490	745
d1, Uniform Delay [s]	53.37	48.27	47.16	52.09	43.53	25.22	49.60	27.37	24.04	54.12	28.62	25.68
k, delay calibration	0.11	0.15	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	5.19	10.46	3.81	10.89	0.97	0.26	4.52	4.85	3.88	12.71	2.47	2.17
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.81	0.88	0.76	0.95	0.64	0.31	0.86	0.83	0.65	0.93	0.67	0.48
d, Delay for Lane Group [s/veh]	58.56	58.73	50.97	62.98	44.50	25.48	54.12	32.22	27.92	66.83	31.09	27.85
Lane Group LOS	E	E	D	E	D	C	D	C	C	E	C	C
Critical Lane Group	No	Yes	No	Yes	No	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	3.80	8.93	7.14	6.65	6.19	4.17	6.44	18.26	12.75	4.64	12.11	7.78
50th-Percentile Queue Length [ft/ln]	94.89	223.15	178.51	166.33	154.78	104.13	160.99	456.44	318.67	116.04	302.86	194.61
95th-Percentile Queue Length [veh/ln]	6.83	13.83	11.52	10.88	10.27	7.50	10.60	25.27	18.60	8.18	17.82	12.36
95th-Percentile Queue Length [ft/ln]	170.81	345.64	288.06	272.08	256.79	187.43	265.03	631.63	465.05	204.38	445.56	309.00

Movement, Approach, & Intersection Results

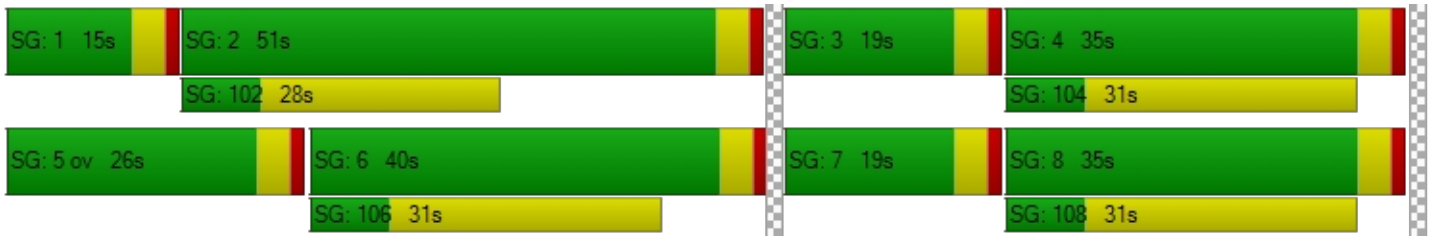
d_M, Delay for Movement [s/veh]	58.56	58.07	50.97	62.98	44.50	25.48	54.12	32.22	27.92	66.83	31.09	27.85
Movement LOS	E	E	D	E	D	C	D	C	C	E	C	C
d_A, Approach Delay [s/veh]	56.22			47.79			35.06			36.40		
Approach LOS	E			D			D			D		
d_I, Intersection Delay [s/veh]	40.48											
Intersection LOS	D											
Intersection V/C	0.867											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	49.52	49.52	49.52	49.52
l_p,int, Pedestrian LOS Score for Intersection	2.798	2.905	3.144	3.119
Crosswalk LOS	C	C	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	517	517	783	600
d_b, Bicycle Delay [s]	33.02	33.02	22.22	29.41
l_b,int, Bicycle LOS Score for Intersection	2.184	2.434	3.536	2.908
Bicycle LOS	B	B	D	C

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 7: Pipeline Avenue at Woodview Road

Control Type:	Signalized	Delay (sec / veh):	21.2
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.639

Intersection Setup

Name	Pipeline Avenue		Pipeline Avenue		Woodview Road	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	40.00		30.00		35.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	No		No		No	
Crosswalk	Yes		No		Yes	

Volumes

Name	Pipeline Avenue		Pipeline Avenue		Woodview Road	
Base Volume Input [veh/h]	149	317	410	118	83	164
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00					
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	149	317	410	118	83	164
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	39	83	108	31	22	43
Total Analysis Volume [veh/h]	157	334	432	124	87	173
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0		0		0	
v_di, Inbound Pedestrian Volume crossing m	0		0		0	
v_co, Outbound Pedestrian Volume crossing	0		0		0	
v_ci, Inbound Pedestrian Volume crossing mi	0		0		0	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Protected	Permissive	Permissive	Permissive	Permissive	Permissive
Signal Group	1	6	2	0	3	0
Auxiliary Signal Groups						
Lead / Lag	Lead	-	-	-	Lead	-
Minimum Green [s]	6	6	6	0	6	0
Maximum Green [s]	30	30	30	0	30	0
Amber [s]	3.0	3.0	3.0	0.0	3.0	0.0
All red [s]	1.0	1.0	1.0	0.0	1.0	0.0
Split [s]	30	48	18	0	42	0
Vehicle Extension [s]	3.0	3.0	3.0	0.0	3.0	0.0
Walk [s]	0	0	7	0	7	0
Pedestrian Clearance [s]	0	0	7	0	11	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No	No		No	
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	2.0	0.0	2.0	0.0
Minimum Recall	No	No	No		No	
Maximum Recall	No	No	No		No	
Pedestrian Recall	No	No	No		No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	C
C, Cycle Length [s]	90	90	90	90
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	10	66	52	16
g / C, Green / Cycle	0.11	0.73	0.58	0.18
(v / s)_i Volume / Saturation Flow Rate	0.09	0.19	0.31	0.15
s, saturation flow rate [veh/h]	1700	1800	1800	1700
c, Capacity [veh/h]	194	1320	1035	303
d1, Uniform Delay [s]	38.95	3.93	11.77	35.92
k, delay calibration	0.11	0.50	0.50	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	7.91	0.46	2.00	7.07
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.81	0.25	0.54	0.86
d, Delay for Lane Group [s/veh]	46.86	4.40	13.77	42.99
Lane Group LOS	D	A	B	D
Critical Lane Group	Yes	No	Yes	Yes
50th-Percentile Queue Length [veh/ln]	3.68	1.53	6.80	5.95
50th-Percentile Queue Length [ft/ln]	92.05	38.36	169.90	148.77
95th-Percentile Queue Length [veh/ln]	6.63	2.76	11.07	9.95
95th-Percentile Queue Length [ft/ln]	165.70	69.05	276.78	248.78

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	46.86	4.40	13.77	13.77	42.99	42.99
Movement LOS	D	A	B	B	D	D
d_A, Approach Delay [s/veh]	17.97		13.77		42.99	
Approach LOS	B		B		D	
d_I, Intersection Delay [s/veh]	21.16					
Intersection LOS	C					
Intersection V/C	0.639					

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	0.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	34.68	0.00	34.68
l_p,int, Pedestrian LOS Score for Intersection	2.415	0.000	2.022
Crosswalk LOS	B	F	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	978	311	844
d_b, Bicycle Delay [s]	11.76	32.10	15.03
l_b,int, Bicycle LOS Score for Intersection	2.370	2.477	1.989
Bicycle LOS	B	B	A

Sequence

Ring 1	1	2	3	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



APPENDIX F

YEAR 2040 TRAFFIC CONDITIONS INTERSECTION LEVEL OF SERVICE CALCULATION WORKSHEETS

APPENDIX F-I

YEAR 2040 WITHOUT PROJECT TRAFFIC CONDITIONS

Intersection Level Of Service Report
Intersection 1: Peyton Drive at Chino Avenue

Control Type:	Signalized	Delay (sec / veh):	37.9
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.519

Intersection Setup

Name	Peyton Drive			Peyton Drive			Chino Avenue			Chino Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	0	1	0	0	1	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Peyton Drive			Peyton Drive			Chino Avenue			Chino Avenue		
Base Volume Input [veh/h]	192	588	143	171	487	239	268	383	150	128	356	142
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	192	588	143	171	487	239	268	383	150	128	356	142
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	51	155	38	45	128	63	71	101	39	34	94	37
Total Analysis Volume [veh/h]	202	619	151	180	513	252	282	403	158	135	375	149
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	1	6	0	5	2	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	12	35	0	12	35	0	34	39	0	34	39	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	24	0	0	24	0	0	28	0	0	28	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	C	L	C	C	L	C	R
C, Cycle Length [s]	120	120	120	120	120	120	120	120	120	120	120	120
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	8	60	60	8	60	60	21	25	25	11	15	15
g / C, Green / Cycle	0.07	0.50	0.50	0.07	0.50	0.50	0.17	0.21	0.21	0.09	0.12	0.12
(v / s)_i Volume / Saturation Flow Rate	0.06	0.14	0.13	0.05	0.14	0.13	0.16	0.10	0.09	0.08	0.10	0.08
s, saturation flow rate [veh/h]	3400	3800	1900	3400	3800	1900	1800	3800	1900	1800	3800	1900
c, Capacity [veh/h]	229	1907	954	229	1907	954	314	781	391	165	468	234
d1, Uniform Delay [s]	55.52	17.26	17.15	55.14	17.22	17.17	48.52	42.13	41.80	53.52	51.21	50.09
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.18	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	10.60	0.35	0.67	5.88	0.35	0.68	13.78	0.48	0.83	9.37	3.24	2.86
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.88	0.27	0.26	0.79	0.27	0.26	0.90	0.49	0.46	0.82	0.80	0.64
d, Delay for Lane Group [s/veh]	66.11	17.61	17.82	61.02	17.57	17.85	62.31	42.60	42.63	62.89	54.45	52.95
Lane Group LOS	E	B	B	E	B	B	E	D	D	E	D	D
Critical Lane Group	Yes	No	No	No	Yes	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	3.37	4.22	4.11	2.87	4.15	4.16	9.44	5.08	4.73	4.43	5.69	4.45
50th-Percentile Queue Length [ft/ln]	84.19	105.61	102.87	71.73	103.87	104.00	236.11	126.92	118.28	110.74	142.34	111.20
95th-Percentile Queue Length [veh/ln]	6.06	7.60	7.41	5.16	7.48	7.49	14.48	8.77	8.30	7.88	9.61	7.91
95th-Percentile Queue Length [ft/ln]	151.55	189.88	185.16	129.11	186.97	187.20	362.11	219.30	207.46	197.04	240.18	197.67

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	66.11	17.65	17.82	61.02	17.57	17.85	62.31	42.61	42.63	62.89	54.45	52.95
Movement LOS	E	B	B	E	B	B	E	D	D	E	D	D
d_A, Approach Delay [s/veh]	27.74			25.92			49.20			55.84		
Approach LOS	C			C			D			E		
d_I, Intersection Delay [s/veh]	37.95											
Intersection LOS	D											
Intersection V/C	0.519											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	49.52	49.52	49.52	49.52
l_p,int, Pedestrian LOS Score for Intersection	2.956	2.982	2.841	2.802
Crosswalk LOS	C	C	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	517	517	583	583
d_b, Bicycle Delay [s]	33.02	33.02	30.12	30.12
l_b,int, Bicycle LOS Score for Intersection	2.094	2.079	2.023	2.103
Bicycle LOS	B	B	B	B

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 2: Gateway Village/Boys Republic Drive at Grand Avenue

Control Type:	Signalized	Delay (sec / veh):	35.4
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.764

Intersection Setup

Name	Boys Republic Drive			Gateway Village			Grand Avenue			Grand Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	1	1	0	0	1	0	0	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			No		

Volumes

Name	Boys Republic Drive			Gateway Village			Grand Avenue			Grand Avenue		
Base Volume Input [veh/h]	13	30	298	92	37	39	55	788	4	507	1285	86
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	13	30	298	92	37	39	55	788	4	507	1285	86
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	8	78	24	10	10	14	207	1	133	338	23
Total Analysis Volume [veh/h]	14	32	314	97	39	41	58	829	4	534	1353	91
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Split	Split	Split	Split	Split	Split	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	0	8	0	0	4	0	5	2	0	1	6	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	0	6	0	0	6	0	6	6	0	6	6	0
Maximum Green [s]	0	30	0	0	30	0	30	30	0	30	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	10	0	0	35	0	12	25	0	50	63	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	0	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	24	0	0	14	0	0	11	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall		No			No		No	No		No	No	
Maximum Recall		No			No		No	No		No	No	
Pedestrian Recall		No			No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	R	L	C	L	C	C	L	C	C
C, Cycle Length [s]	120	120	120	120	120	120	120	120	120	120
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	22	22	8	8	5	36	36	38	69	69
g / C, Green / Cycle	0.18	0.18	0.07	0.07	0.04	0.30	0.30	0.31	0.57	0.57
(v / s)_i Volume / Saturation Flow Rate	0.03	0.17	0.05	0.05	0.03	0.14	0.15	0.30	0.25	0.26
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1800	3800	1900	1800	3800	1900
c, Capacity [veh/h]	330	348	124	124	78	1139	569	567	2169	1085
d1, Uniform Delay [s]	41.09	47.96	54.77	54.71	56.74	34.39	34.67	40.07	14.77	14.87
k, delay calibration	0.11	0.20	0.11	0.11	0.11	0.50	0.50	0.30	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.19	14.41	7.66	7.16	12.66	1.45	3.16	18.16	0.65	1.35
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.14	0.90	0.72	0.71	0.74	0.48	0.50	0.94	0.44	0.45
d, Delay for Lane Group [s/veh]	41.28	62.37	62.42	61.86	69.40	35.84	37.83	58.22	15.42	16.22
Lane Group LOS	D	E	E	E	E	D	D	E	B	B
Critical Lane Group	No	Yes	Yes	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	1.17	10.55	2.91	2.84	2.02	6.76	7.40	18.01	7.48	7.90
50th-Percentile Queue Length [ft/ln]	29.16	263.77	72.87	70.99	50.38	168.99	185.01	450.37	186.98	197.40
95th-Percentile Queue Length [veh/ln]	2.10	15.88	5.25	5.11	3.63	11.02	11.86	24.98	11.96	12.50
95th-Percentile Queue Length [ft/ln]	52.49	396.94	131.17	127.77	90.68	275.58	296.54	624.39	299.11	312.61

Movement, Approach, & Intersection Results

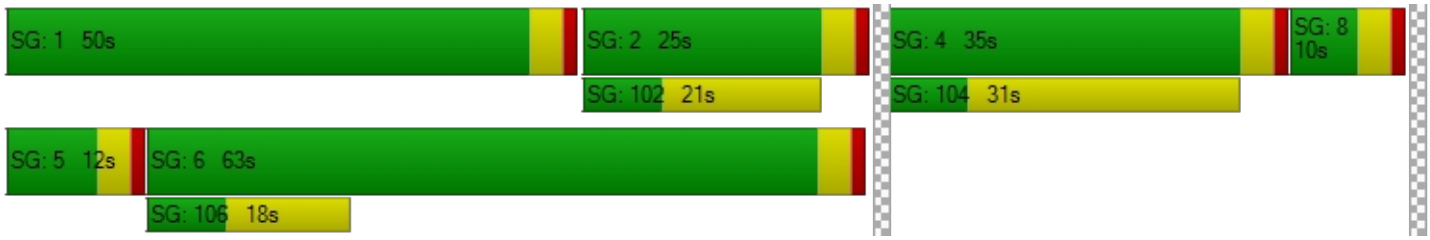
d_M, Delay for Movement [s/veh]	41.28	41.28	62.37	62.38	61.86	61.86	69.40	36.52	37.83	58.22	15.66	16.22
Movement LOS	D	D	E	E	E	E	E	D	D	E	B	B
d_A, Approach Delay [s/veh]	59.68			62.15			38.67			27.17		
Approach LOS	E			E			D			C		
d_I, Intersection Delay [s/veh]	35.43											
Intersection LOS	D											
Intersection V/C	0.764											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	0.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	49.52	49.52	49.52	0.00
l_p,int, Pedestrian LOS Score for Intersection	2.373	2.070	2.928	0.000
Crosswalk LOS	B	B	C	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	100	517	350	983
d_b, Bicycle Delay [s]	54.17	33.02	40.85	15.52
l_b,int, Bicycle LOS Score for Intersection	2.154	1.852	2.050	2.648
Bicycle LOS	B	A	B	B

Sequence

Ring 1	1	2	4	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 3: Peyton Drive at Eucalyptus Avenue

Control Type:	Signalized	Delay (sec / veh):	19.6
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.499

Intersection Setup

Name	Peyton Drive			Peyton Drive			Eucalyptus Avenue			Eucalyptus Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	1	1	0	0	1	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Peyton Drive			Peyton Drive			Eucalyptus Avenue			Eucalyptus Avenue		
Base Volume Input [veh/h]	20	680	126	206	567	269	296	134	14	192	167	300
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	20	680	126	206	567	269	296	134	14	192	167	300
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	5	179	33	54	149	71	78	35	4	51	44	79
Total Analysis Volume [veh/h]	21	716	133	217	597	283	312	141	15	202	176	316
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal Group	1	6	0	5	2	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	6	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	10	29	0	10	29	0	10	41	0	10	41	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	18	0	0	14	0	0	21	0	0	24	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		Yes	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	R	L	C	C	L	C	R
C, Cycle Length [s]	90	90	90	90	90	90	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	0.00	0.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	57	47	47	57	50	50	25	25	15	25	15	15
g / C, Green / Cycle	0.63	0.52	0.52	0.63	0.56	0.56	0.28	0.28	0.17	0.28	0.17	0.17
(v / s)_i Volume / Saturation Flow Rate	0.01	0.15	0.15	0.12	0.16	0.15	0.09	0.09	0.08	0.11	0.14	0.12
s, saturation flow rate [veh/h]	1800	3800	1900	1800	3800	1900	1800	1800	1900	1800	1900	1900
c, Capacity [veh/h]	1090	1967	983	1089	2115	1057	404	506	323	380	325	325
d1, Uniform Delay [s]	6.26	12.34	12.30	7.04	10.52	10.42	25.47	25.47	33.85	26.20	35.85	35.37
k, delay calibration	0.11	0.50	0.50	0.50	0.50	0.50	0.48	0.48	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.01	0.37	0.73	0.41	0.33	0.62	2.67	1.52	1.12	1.15	4.35	3.06
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.02	0.29	0.28	0.20	0.28	0.27	0.39	0.31	0.48	0.53	0.79	0.72
d, Delay for Lane Group [s/veh]	6.27	12.72	13.03	7.45	10.86	11.04	28.14	26.99	34.98	27.35	40.20	38.43
Lane Group LOS	A	B	B	A	B	B	C	C	C	C	D	D
Critical Lane Group	No	Yes	No	Yes	No	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.14	3.17	3.20	1.70	3.00	2.90	2.88	2.79	3.14	3.56	5.71	5.07
50th-Percentile Queue Length [ft/ln]	3.44	79.29	80.03	42.43	74.92	72.60	72.00	69.84	78.55	88.97	142.75	126.73
95th-Percentile Queue Length [veh/ln]	0.25	5.71	5.76	3.05	5.39	5.23	5.18	5.03	5.66	6.41	9.63	8.76
95th-Percentile Queue Length [ft/ln]	6.19	142.72	144.05	76.37	134.85	130.68	129.61	125.72	141.39	160.14	240.72	219.04

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	6.27	12.78	13.03	7.45	10.86	11.04	27.56	34.98	34.98	27.35	40.20	38.85
Movement LOS	A	B	B	A	B	B	C	C	C	C	D	D
d_A, Approach Delay [s/veh]	12.66			10.23			30.03			35.86		
Approach LOS	B			B			C			D		
d_I, Intersection Delay [s/veh]	19.55											
Intersection LOS	B											
Intersection V/C	0.499											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	34.72	34.72	34.72	34.72
l_p,int, Pedestrian LOS Score for Intersection	3.013	3.198	2.379	2.697
Crosswalk LOS	C	C	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	555	555	821	821
d_b, Bicycle Delay [s]	23.51	23.51	15.64	15.64
l_b,int, Bicycle LOS Score for Intersection	2.038	2.465	1.946	2.705
Bicycle LOS	B	B	A	B

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 4: Rustic Drive/Carbon Canyon Road at Chino Hills Parkway

Control Type:	Signalized	Delay (sec / veh):	78.2
Analysis Method:	HCM 7th Edition	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.006

Intersection Setup

Name	Carbon Canyon Road			Rustic Drive			Chino Hills Parkway			Chino Hills Parkway		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	1	0	0	1	0	1	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			No		

Volumes

Name	Carbon Canyon Road			Rustic Drive			Chino Hills Parkway			Chino Hills Parkway		
Base Volume Input [veh/h]	233	1	613	31	1	1	17	380	322	1800	771	9
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	233	1	613	31	1	1	17	380	322	1800	771	9
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	61	0	161	8	0	0	4	100	85	474	203	2
Total Analysis Volume [veh/h]	245	1	645	33	1	1	18	400	339	1895	812	9
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	0	8	0	0	4	0	5	2	0	1	6	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	0	6	0	0	6	0	6	6	0	6	6	0
Maximum Green [s]	0	30	0	0	30	0	30	30	0	30	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	32	0	0	32	0	10	29	0	59	78	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	0	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	21	0	0	18	0	0	11	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall		No			No		No	No		No	No	
Maximum Recall		No			No		No	No		No	No	
Pedestrian Recall		No			No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	L	C	R	L	C	C
C, Cycle Length [s]	120	120	120	120	120	120	120	120	120	120	120
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	23	23	23	23	23	3	30	30	55	82	82
g / C, Green / Cycle	0.19	0.19	0.19	0.19	0.19	0.02	0.25	0.25	0.46	0.68	0.68
(v / s)_i Volume / Saturation Flow Rate	0.14	0.17	0.17	0.02	0.00	0.01	0.11	0.18	0.56	0.22	0.22
s, saturation flow rate [veh/h]	1800	1900	1900	1800	1900	1800	3800	1900	3400	1900	1900
c, Capacity [veh/h]	377	368	368	82	368	41	946	473	1556	1298	1298
d1, Uniform Delay [s]	45.15	46.99	46.99	39.73	39.04	57.84	37.83	41.19	32.54	7.67	7.67
k, delay calibration	0.12	0.22	0.22	0.11	0.11	0.11	0.50	0.50	0.18	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	2.04	12.40	12.38	3.20	0.01	7.06	1.39	9.01	100.43	0.64	0.64
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.65	0.88	0.88	0.40	0.01	0.44	0.42	0.72	1.22	0.32	0.32
d, Delay for Lane Group [s/veh]	47.18	59.39	59.37	42.93	39.05	64.89	39.21	50.20	132.97	8.31	8.31
Lane Group LOS	D	E	E	D	D	E	D	D	F	A	A
Critical Lane Group	No	Yes	No	No	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	7.02	10.60	10.60	0.88	0.05	0.62	5.14	10.33	43.46	4.24	4.24
50th-Percentile Queue Length [ft/ln]	175.41	265.08	264.99	21.97	1.22	15.52	128.43	258.24	1086.60	106.09	106.09
95th-Percentile Queue Length [veh/ln]	11.36	15.94	15.94	1.58	0.09	1.12	8.85	15.60	62.30	7.62	7.62
95th-Percentile Queue Length [ft/ln]	284.01	398.58	398.48	39.55	2.19	27.93	221.36	390.01	1557.57	190.55	190.55

Movement, Approach, & Intersection Results

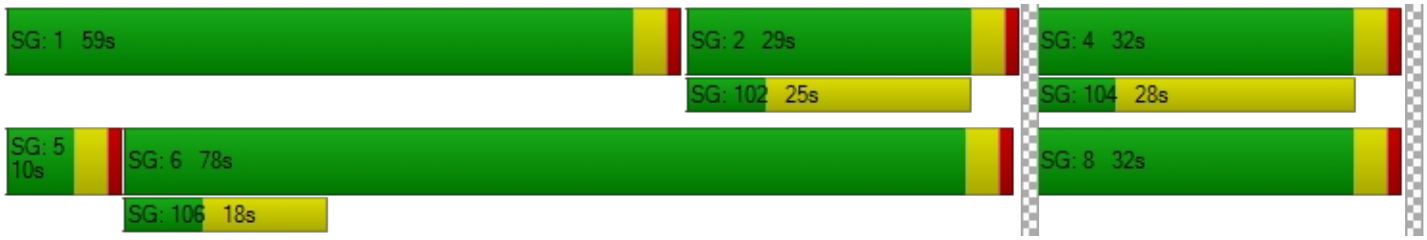
d_M, Delay for Movement [s/veh]	47.18	59.39	59.38	42.93	39.05	39.05	64.89	39.21	50.20	132.97	8.31	8.31
Movement LOS	D	E	E	D	D	D	E	D	D	F	A	A
d_A, Approach Delay [s/veh]	56.03			42.71			44.75			95.29		
Approach LOS	E			D			D			F		
d_I, Intersection Delay [s/veh]	78.22											
Intersection LOS	E											
Intersection V/C	1.006											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	0.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	49.50	49.50	49.50	0.00
l_p,int, Pedestrian LOS Score for Intersection	2.923	1.974	3.110	0.000
Crosswalk LOS	C	A	C	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	467	467	417	1234
d_b, Bicycle Delay [s]	35.26	35.26	37.60	8.81
l_b,int, Bicycle LOS Score for Intersection	3.030	1.617	2.184	3.800
Bicycle LOS	C	A	B	D

Sequence

Ring 1	1	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 5: Peyton Drive at Chino Hills Parkway

Control Type:	Signalized	Delay (sec / veh):	40.4
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.891

Intersection Setup

Name	Peyton Drive			Peyton Drive			Chino Hills Parkway			Chino Hills Parkway		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	1	1	0	0	1	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Peyton Drive			Peyton Drive			Chino Hills Parkway			Chino Hills Parkway		
Base Volume Input [veh/h]	499	413	307	196	225	353	195	628	121	210	1332	286
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	499	413	307	196	225	353	195	628	121	210	1332	286
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	131	109	81	52	59	93	51	165	32	55	351	75
Total Analysis Volume [veh/h]	525	435	323	206	237	372	205	661	127	221	1402	301
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Overlap	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	3	8	0	7	4	4	5	2	0	1	6	0
Auxiliary Signal Groups						4,5						
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	6	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	30	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	1.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	24	38	0	18	32	32	12	39	0	15	42	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	7	0	7	0	0	7	0
Pedestrian Clearance [s]	0	24	0	0	21	21	0	21	0	0	21	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No	No	No	No		No	No	
Maximum Recall	No	No		No	No	No	No	No		No	No	
Pedestrian Recall	No	No		No	No	No	No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	R	L	C	C	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	19	26	26	14	21	33	8	45	45	9	46	46
g / C, Green / Cycle	0.17	0.24	0.24	0.13	0.19	0.30	0.07	0.40	0.40	0.08	0.41	0.41
(v / s)_i Volume / Saturation Flow Rate	0.15	0.21	0.19	0.11	0.06	0.20	0.06	0.21	0.20	0.07	0.37	0.16
s, saturation flow rate [veh/h]	3400	1900	1900	1800	3800	1900	3400	1900	1900	3400	3800	1900
c, Capacity [veh/h]	588	454	454	231	737	578	252	766	766	287	1572	786
d1, Uniform Delay [s]	44.56	40.55	39.21	47.29	38.18	33.15	50.26	24.93	24.57	49.41	30.03	22.52
k, delay calibration	0.11	0.23	0.17	0.11	0.11	0.24	0.11	0.50	0.50	0.11	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	4.96	12.04	4.42	11.37	0.25	2.70	6.25	2.60	2.32	4.36	8.11	1.42
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.89	0.89	0.78	0.89	0.32	0.64	0.81	0.53	0.50	0.77	0.89	0.38
d, Delay for Lane Group [s/veh]	49.52	52.59	43.63	58.66	38.43	35.84	56.51	27.54	26.89	53.77	38.14	23.93
Lane Group LOS	D	D	D	E	D	D	E	C	C	D	D	C
Critical Lane Group	Yes	No	No	No	No	Yes	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	7.37	12.01	9.41	6.26	2.78	8.95	3.00	8.45	7.84	3.14	18.45	5.68
50th-Percentile Queue Length [ft/ln]	184.16	300.13	235.34	156.59	69.42	223.77	74.88	211.18	196.01	78.62	461.18	141.96
95th-Percentile Queue Length [veh/ln]	11.82	17.69	14.45	10.37	5.00	13.86	5.39	13.21	12.43	5.66	25.49	9.59
95th-Percentile Queue Length [ft/ln]	295.44	442.19	361.13	259.20	124.96	346.43	134.78	330.35	310.82	141.52	637.28	239.65

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	49.52	51.97	43.63	58.66	38.43	35.84	56.51	27.28	26.89	53.77	38.14	23.93
Movement LOS	D	D	D	E	D	D	E	C	C	D	D	C
d_A, Approach Delay [s/veh]	48.87			42.36			33.27			37.71		
Approach LOS	D			D			C			D		
d_I, Intersection Delay [s/veh]	40.44											
Intersection LOS	D											
Intersection V/C	0.891											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	44.60	44.60	44.60	44.60
l_p,int, Pedestrian LOS Score for Intersection	2.766	2.748	2.997	3.037
Crosswalk LOS	C	B	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	618	509	636	690
d_b, Bicycle Delay [s]	26.30	30.61	25.61	23.61
l_b,int, Bicycle LOS Score for Intersection	2.618	2.232	2.379	3.147
Bicycle LOS	B	B	B	C

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 6: Peyton Drive at Woodview Road

Control Type:	All-way stop	Delay (sec / veh):	14.0
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.617

Intersection Setup

Name	Peyton Drive		Woodview Road		Woodview Road	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	1	1	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	45.00		40.00		35.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

Volumes

Name	Peyton Drive		Woodview Road		Woodview Road	
Base Volume Input [veh/h]	236	77	69	69	67	348
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	236	77	69	69	67	348
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	62	20	18	18	18	92
Total Analysis Volume [veh/h]	248	81	73	73	71	366
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	549	673	543	588	709
Degree of Utilization, x	0.45	0.12	0.13	0.12	0.62

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	2.33	0.41	0.46	0.42	4.28
95th-Percentile Queue Length [ft]	58.21	10.21	11.56	10.56	107.12
Approach Delay [s/veh]	13.13		10.02		15.90
Approach LOS	B		B		C
Intersection Delay [s/veh]	13.96				
Intersection LOS	B				

Intersection Level Of Service Report
Intersection 7: Pipeline Avenue at Woodview Road

Control Type:	Two-way stop	Delay (sec / veh):	129.5
Analysis Method:	HCM 7th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.630

Intersection Setup

Name	Pipeline Avenue		Pipeline Avenue		Woodview Road	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	40.00		30.00		35.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name	Pipeline Avenue		Pipeline Avenue		Woodview Road	
Base Volume Input [veh/h]	349	326	264	39	61	316
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	349	326	264	39	61	316
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	92	86	69	10	16	83
Total Analysis Volume [veh/h]	367	343	278	41	64	333
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.30	0.00	0.00	0.00	0.63	0.45
d_M, Delay for Movement [s/veh]	8.41	0.00	0.00	0.00	129.50	98.92
Movement LOS	A	A	A	A	F	F
95th-Percentile Queue Length [veh/ln]	0.77	0.77	0.00	0.00	14.16	14.16
95th-Percentile Queue Length [ft/ln]	19.13	19.13	0.00	0.00	354.01	354.01
d_A, Approach Delay [s/veh]	4.35		0.00		103.85	
Approach LOS	A		A		F	
d_I, Intersection Delay [s/veh]	31.08					
Intersection LOS	F					

Intersection Level Of Service Report
Intersection 8: Pipeline Avenue at Soquel Canyon Parkway

Control Type:	All-way stop	Delay (sec / veh):	83.5
Analysis Method:	HCM 7th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.147

Intersection Setup

Name	Pipeline Avenue		Soquel Canyon Parkway		Soquel Canyon Parkway	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	1	0	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	40.00		45.00		50.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		No	

Volumes

Name	Pipeline Avenue		Soquel Canyon Parkway		Soquel Canyon Parkway	
Base Volume Input [veh/h]	562	22	32	54	33	605
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	562	22	32	54	33	605
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	148	6	8	14	9	159
Total Analysis Volume [veh/h]	592	23	34	57	35	637
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	615	445	474	474	474	546	546	637
Degree of Utilization, x	1.15	0.08	0.04	0.04	0.04	0.03	0.03	1.04

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	20.88	0.25	0.12	0.12	0.12	0.10	0.10	17.24
95th-Percentile Queue Length [ft]	522.11	6.17	3.12	3.12	3.12	2.48	2.48	431.08
Approach Delay [s/veh]	110.24	10.92				68.96		
Approach LOS	F	B				F		
Intersection Delay [s/veh]	83.55							
Intersection LOS	F							

Intersection Level Of Service Report

Intersection 9: Soquel Canyon Parkway at Los Serranos Country Club Drive/Butterfield Ranch Road

Control Type:	Signalized	Delay (sec / veh):	33.4
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.544

Intersection Setup

Name	Soquel Canyon Parkway			Soquel Canyon Parkway			Lo Se			Butterfield Ranch Road		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	0	1	0	0	1	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Soquel Canyon Parkway			Soquel Canyon Parkway			Lo Se			Butterfield Ranch Road		
Base Volume Input [veh/h]	14	734	130	120	341	266	351	158	21	291	267	630
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	14	734	130	120	341	266	351	158	21	291	267	630
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	4	193	34	32	90	70	92	42	6	77	70	166
Total Analysis Volume [veh/h]	15	773	137	126	359	280	369	166	22	306	281	663
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	115
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Overlap
Signal Group	1	6	0	5	2	0	3	8	0	7	4	4
Auxiliary Signal Groups												4,5
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	6
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	30
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	3.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	1.0
Split [s]	12	39	0	10	37	0	27	39	0	27	39	39
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	3.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	7
Pedestrian Clearance [s]	0	28	0	0	18	0	0	28	0	0	28	28
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	2.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	2.0
Minimum Recall	No	No		No	No		No	No		No	No	No
Maximum Recall	No	No		No	No		No	No		No	No	No
Pedestrian Recall	No	No		No	No		No	No		No	No	No
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	C	L	C	C	L	C	R
C, Cycle Length [s]	115	115	115	115	115	115	115	115	115	115	115	115
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	0.00
g_i, Effective Green Time [s]	2	57	57	6	61	61	15	23	23	13	21	31
g / C, Green / Cycle	0.02	0.49	0.49	0.05	0.53	0.53	0.13	0.20	0.20	0.11	0.18	0.27
(v / s)_i Volume / Saturation Flow Rate	0.01	0.16	0.16	0.04	0.09	0.15	0.11	0.05	0.05	0.09	0.15	0.17
s, saturation flow rate [veh/h]	1800	3800	1900	3400	3800	1900	3400	1900	1900	3400	1900	3800
c, Capacity [veh/h]	38	1877	938	180	1999	999	443	385	385	379	349	1032
d1, Uniform Delay [s]	55.63	17.56	17.50	53.59	14.28	15.16	48.82	38.53	38.47	49.91	44.99	36.99
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	6.72	0.46	0.90	4.86	0.20	0.70	4.14	0.33	0.32	4.08	4.37	0.68
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.40	0.33	0.32	0.70	0.18	0.28	0.83	0.25	0.24	0.81	0.80	0.64
d, Delay for Lane Group [s/veh]	62.35	18.02	18.39	58.46	14.47	15.86	52.96	38.87	38.78	53.99	49.36	37.67
Lane Group LOS	E	B	B	E	B	B	D	D	D	D	D	D
Critical Lane Group	No	Yes	No	Yes	No	No	Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	0.50	4.94	4.95	1.91	2.48	4.21	5.41	2.31	2.23	4.50	8.08	8.29
50th-Percentile Queue Length [ft/ln]	12.50	123.56	123.80	47.84	62.00	105.30	135.28	57.77	55.75	112.62	201.92	207.36
95th-Percentile Queue Length [veh/ln]	0.90	8.59	8.60	3.44	4.46	7.58	9.23	4.16	4.01	7.99	12.74	13.02
95th-Percentile Queue Length [ft/ln]	22.50	214.71	215.03	86.12	111.59	189.44	230.66	103.99	100.35	199.65	318.44	325.44

Movement, Approach, & Intersection Results

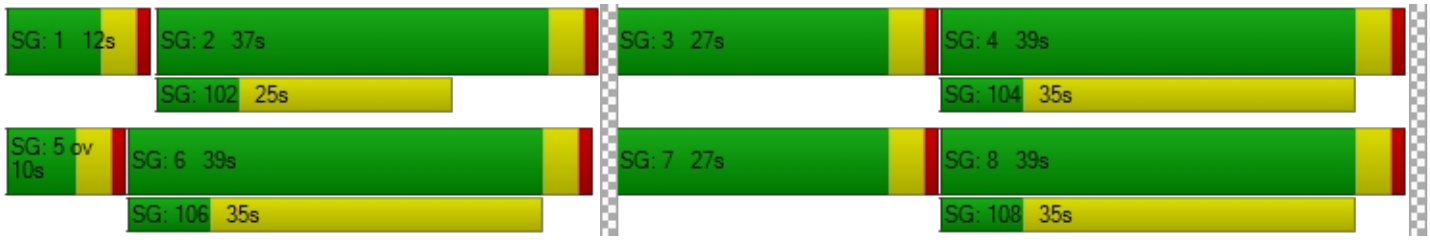
d_M, Delay for Movement [s/veh]	62.35	18.10	18.39	58.46	14.47	15.86	52.96	38.83	38.78	53.99	49.36	37.67
Movement LOS	E	B	B	E	B	B	D	D	D	D	D	D
d_A, Approach Delay [s/veh]	18.86			22.23			48.19			44.29		
Approach LOS	B			C			D			D		
d_I, Intersection Delay [s/veh]	33.36											
Intersection LOS	C											
Intersection V/C	0.544											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	47.05	47.05	47.05	47.05
l_p,int, Pedestrian LOS Score for Intersection	2.830	3.050	2.533	2.942
Crosswalk LOS	C	C	B	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	608	574	608	608
d_b, Bicycle Delay [s]	27.84	29.25	27.84	27.84
l_b,int, Bicycle LOS Score for Intersection	2.068	1.980	2.019	3.622
Bicycle LOS	B	A	B	D

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

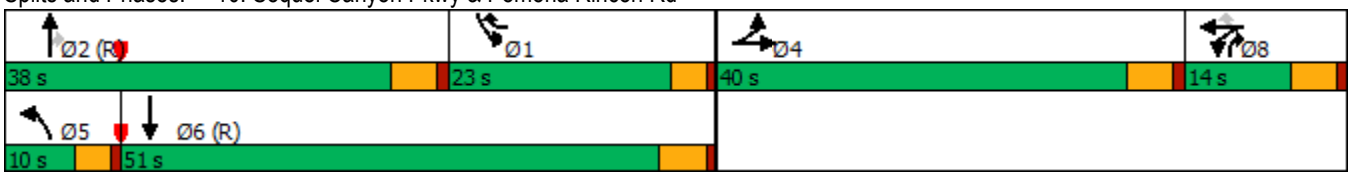


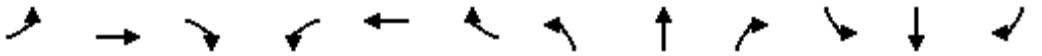
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	32	92	7	160	3	518	34	1292	400	677	573	62
Future Volume (vph)	32	92	7	160	3	518	34	1292	400	677	573	62
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	0.95	0.91	0.95	1.00	0.86	0.86	0.97	0.91	0.91
Frt		0.989			0.861	0.850		0.995	0.850		0.985	
Flt Protected	0.950			0.950	0.997		0.950			0.950		
Satd. Flow (prot)	1770	1842	0	1681	1455	1504	1770	4782	1362	3433	5009	0
Flt Permitted	0.950			0.950	0.997		0.950			0.950		
Satd. Flow (perm)	1770	1842	0	1681	1455	1504	1770	4782	1362	3433	5009	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3			383	414		4	396		19	
Link Speed (mph)		25			25			50			50	
Link Distance (ft)		560			625			594			526	
Travel Time (s)		15.3			17.0			8.1			7.2	
Peak Hour Factor	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65
Adj. Flow (vph)	49	142	11	246	5	797	52	1988	615	1042	882	95
Shared Lane Traffic (%)				10%		48%			10%			
Lane Group Flow (vph)	49	153	0	221	413	414	52	2050	553	1042	977	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2	1	1	2	1	1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100		20	100	20	20	100	20	20	100	
Trailing Detector (ft)	0	0		0	0	0	0	0	0	0	0	
Detector 1 Position(ft)	0	0		0	0	0	0	0	0	0	0	
Detector 1 Size(ft)	20	6		20	6	20	20	6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Split	NA		Split	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	
Protected Phases	4	4		8	8	1	5	2	8	1	6	
Permitted Phases						8			2			
Detector Phase	4	4		8	8	1	5	2	8	1	6	
Switch Phase												
Minimum Initial (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Split (s)	40.0	40.0		11.0	11.0	10.0	10.0	30.0	11.0	10.0	23.0	
Total Split (s)	40.0	40.0		14.0	14.0	23.0	10.0	38.0	14.0	23.0	51.0	
Total Split (%)	34.8%	34.8%		12.2%	12.2%	20.0%	8.7%	33.0%	12.2%	20.0%	44.3%	
Maximum Green (s)	35.0	35.0		9.0	9.0	19.0	6.0	33.0	9.0	19.0	46.0	
Yellow Time (s)	4.0	4.0		4.0	4.0	3.0	3.0	4.0	4.0	3.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0	4.0	4.0	5.0	5.0	4.0	5.0	
Lead/Lag						Lag	Lead	Lead		Lag	Lag	
Lead-Lag Optimize?						Yes	Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	None		None	None	None	None	C-Max	None	None	C-Max	
Walk Time (s)	7.0	7.0						7.0			7.0	
Flash Dont Walk (s)	28.0	28.0						18.0			11.0	
Pedestrian Calls (#/hr)	5	5						5			5	
Act Effct Green (s)	17.7	17.7		26.3	26.3	46.3	6.0	33.0	64.3	19.0	48.0	
Actuated g/C Ratio	0.15	0.15		0.23	0.23	0.40	0.05	0.29	0.56	0.17	0.42	
v/c Ratio	0.18	0.54		0.58	0.66	0.49	0.57	1.49	0.59	1.84	0.46	
Control Delay	39.9	48.9		48.6	12.2	3.6	76.8	256.4	8.5	412.9	25.1	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	39.9	48.9		48.6	12.2	3.6	76.8	256.4	8.5	412.9	25.1	
LOS	D	D		D	B	A	E	F	A	F	C	
Approach Delay		46.8			16.5			201.3			225.2	
Approach LOS		D			B			F			F	
Queue Length 50th (ft)	33	107		148	18	0	38	~820	59	~603	190	
Queue Length 95th (ft)	39	97		#271	5	0	58	#549	56	#465	153	
Internal Link Dist (ft)		480			545			514			446	
Turn Bay Length (ft)												
Base Capacity (vph)	538	562		384	628	853	92	1375	936	567	2102	
Starvation Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.09	0.27		0.58	0.66	0.49	0.57	1.49	0.59	1.84	0.46	

Intersection Summary			
Area Type:	Other		
Cycle Length: 115			
Actuated Cycle Length: 115			
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green			
Natural Cycle: 115			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.84			
Intersection Signal Delay: 171.5		Intersection LOS: F	
Intersection Capacity Utilization 78.2%		ICU Level of Service D	
Analysis Period (min) 15			
~ Volume exceeds capacity, queue is theoretically infinite.			
Queue shown is maximum after two cycles.			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 10: Soquel Canyon Pkwy & Pomona Rincon Rd





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	32	92	7	160	3	518	34	1292	400	677	573	62
Future Volume (veh/h)	32	92	7	160	3	518	34	1292	400	677	573	62
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	49	142	11	166	0	886	52	1988	615	1042	882	95
Peak Hour Factor	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	190	183	14	139	0	1371	75	1610	579	1224	2845	305
Arrive On Green	0.11	0.11	0.11	0.08	0.00	0.08	0.04	0.29	0.29	0.35	0.61	0.61
Sat Flow, veh/h	1781	1714	133	1781	0	3170	1781	5611	1585	3456	4682	502
Grp Volume(v), veh/h	49	0	153	166	0	886	52	1988	615	1042	640	337
Grp Sat Flow(s),veh/h/ln	1781	0	1846	1781	0	1585	1781	1870	1585	1728	1702	1780
Q Serve(g_s), s	2.9	0.0	9.3	9.0	0.0	0.0	3.3	33.0	33.0	32.1	10.5	10.5
Cycle Q Clear(g_c), s	2.9	0.0	9.3	9.0	0.0	0.0	3.3	33.0	33.0	32.1	10.5	10.5
Prop In Lane	1.00		0.07	1.00		1.00	1.00		1.00	1.00		0.28
Lane Grp Cap(c), veh/h	190	0	197	139	0	1371	75	1610	579	1224	2069	1082
V/C Ratio(X)	0.26	0.00	0.78	1.19	0.00	0.65	0.69	1.23	1.06	0.85	0.31	0.31
Avail Cap(c_a), veh/h	542	0	562	139	0	1371	93	1610	579	1224	2069	1082
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	47.2	0.0	50.0	53.0	0.0	25.7	54.3	41.0	33.6	34.3	10.9	10.9
Incr Delay (d2), s/veh	0.7	0.0	6.5	136.5	0.0	1.1	14.9	111.2	55.1	5.9	0.4	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	0.0	4.7	9.3	0.0	9.7	1.7	30.9	25.1	13.6	3.6	3.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	47.9	0.0	56.5	189.5	0.0	26.8	69.2	152.2	88.7	40.2	11.3	11.7
LnGrp LOS	D	A	E	F	A	C	E	F	F	D	B	B
Approach Vol, veh/h		202			1052			2655			2019	
Approach Delay, s/veh		54.4			52.4			135.9			26.3	
Approach LOS		D			D			F			C	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	45.7	38.0		17.3	8.9	74.9		14.0				
Change Period (Y+Rc), s	5.0	* 5		5.0	4.0	5.0		5.0				
Max Green Setting (Gmax), s	19.0	* 33		35.0	6.0	46.0		9.0				
Max Q Clear Time (g_c+I1), s	34.1	35.0		11.3	5.3	12.5		11.0				
Green Ext Time (p_c), s	0.0	0.0		1.0	0.0	6.5		0.0				

Intersection Summary			
HCM 6th Ctrl Delay		81.0	
HCM 6th LOS		F	

Notes

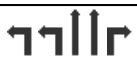
User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection Level Of Service Report
Intersection 11: Peyton Drive at Grand Avenue

Control Type:	Signalized	Delay (sec / veh):	37.0
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.740

Intersection Setup

Name	Peyton Drive			Peyton Drive			Grand Avenue			Grand Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	1	0	0	1	0	1	1	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Peyton Drive			Peyton Drive			Grand Avenue			Grand Avenue		
Base Volume Input [veh/h]	245	674	147	144	788	269	235	620	285	246	1041	94
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	245	674	147	144	788	269	235	620	285	246	1041	94
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	64	177	39	38	207	71	62	163	75	65	274	25
Total Analysis Volume [veh/h]	258	709	155	152	829	283	247	653	300	259	1096	99
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	115
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	1	6	0	5	2	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	14	39	0	10	35	0	14	46	0	20	52	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	28	0	0	24	0	0	31	0	0	28	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	C	L	C	R	L	C	R
C, Cycle Length [s]	115	115	115	115	115	115	115	115	115	115	115	115
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	10	46	46	6	42	42	10	36	36	11	37	37
g / C, Green / Cycle	0.09	0.40	0.40	0.05	0.36	0.36	0.09	0.32	0.32	0.10	0.32	0.32
(v / s)_i Volume / Saturation Flow Rate	0.08	0.12	0.08	0.04	0.20	0.18	0.07	0.17	0.16	0.08	0.29	0.05
s, saturation flow rate [veh/h]	3400	5700	1900	3400	3800	1900	3400	3800	1900	3400	3800	1900
c, Capacity [veh/h]	298	2263	754	180	1377	689	298	1198	599	325	1229	614
d1, Uniform Delay [s]	51.84	23.89	22.77	54.02	29.25	28.68	51.66	32.57	32.03	50.95	37.02	27.79
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	7.53	0.36	0.62	10.22	1.60	2.68	5.90	0.39	0.65	4.47	2.49	0.12
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.87	0.31	0.21	0.84	0.55	0.51	0.83	0.54	0.50	0.80	0.89	0.16
d, Delay for Lane Group [s/veh]	59.37	24.25	23.39	64.25	30.85	31.36	57.56	32.96	32.68	55.42	39.51	27.92
Lane Group LOS	E	C	C	E	C	C	E	C	C	E	D	C
Critical Lane Group	Yes	No	No	No	Yes	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	3.98	4.49	2.89	2.43	8.62	8.03	3.74	7.55	6.88	3.85	14.86	1.98
50th-Percentile Queue Length [ft/ln]	99.51	112.29	72.25	60.87	215.53	200.69	93.61	188.85	171.89	96.26	371.41	49.45
95th-Percentile Queue Length [veh/ln]	7.16	7.97	5.20	4.38	13.44	12.67	6.74	12.06	11.18	6.93	21.18	3.56
95th-Percentile Queue Length [ft/ln]	179.12	199.18	130.05	109.57	335.91	316.85	168.50	301.54	279.40	173.26	529.45	89.01

Movement, Approach, & Intersection Results

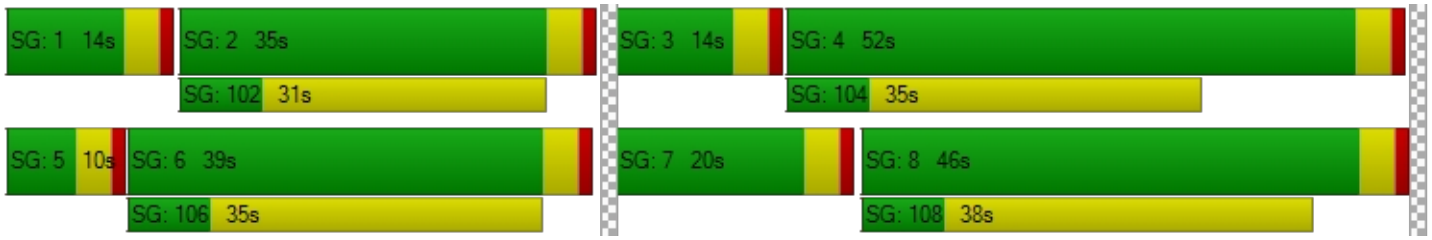
d_M, Delay for Movement [s/veh]	59.37	24.25	23.39	64.25	30.89	31.36	57.56	32.96	32.68	55.42	39.51	27.92
Movement LOS	E	C	C	E	C	C	E	C	C	E	D	C
d_A, Approach Delay [s/veh]	32.21			35.01			37.95			41.55		
Approach LOS	C			D			D			D		
d_I, Intersection Delay [s/veh]	36.97											
Intersection LOS	D											
Intersection V/C	0.740											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	47.05	47.05	47.05	47.05
l_p,int, Pedestrian LOS Score for Intersection	3.133	3.020	3.001	3.031
Crosswalk LOS	C	C	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	608	539	730	834
d_b, Bicycle Delay [s]	27.84	30.70	23.19	19.53
l_b,int, Bicycle LOS Score for Intersection	2.177	2.255	2.550	2.759
Bicycle LOS	B	B	B	C

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 12: Carbon Canyon Road at Fairway Drive/Ginseng Lane

Control Type:	Two-way stop	Delay (sec / veh):	422.9
Analysis Method:	HCM 7th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.339

Intersection Setup

Name	Carbon Canyon Road			Carbon Canyon Road			Fairway Drive			Ginseng Lane		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	0	0	0	1	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	45.00			45.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			No			No		

Volumes

Name	Carbon Canyon Road			Carbon Canyon Road			Fairway Drive			Ginseng Lane		
Base Volume Input [veh/h]	17	626	0	1	1943	18	4	0	4	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	17	626	0	1	1943	18	4	0	4	0	0	0
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	4	165	0	0	511	5	1	0	1	0	0	0
Total Analysis Volume [veh/h]	18	659	0	1	2045	19	4	0	4	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Free	Free	Stop	Stop
Flared Lane				No
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance			No	No
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.07	0.01	0.00	0.00	0.02	0.00	0.34	0.00	0.06	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	19.27	0.00	0.00	8.88	0.00	0.00	422.94	315.28	59.95	329.53	205.00	12.76
Movement LOS	C	A	A	A	A	A	F	F	F	F	F	B
95th-Percentile Queue Length [veh/ln]	0.21	0.00	0.00	0.00	0.00	0.00	0.83	0.83	0.18	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	5.32	0.00	0.00	0.08	0.00	0.00	20.76	20.76	4.48	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	0.51			0.00			241.44			182.43		
Approach LOS	A			A			F			F		
d_I, Intersection Delay [s/veh]	0.83											
Intersection LOS	F											

Intersection Level Of Service Report
Intersection 13: Carbon Canyon Road at Canyon Hills Road

Control Type:	Two-way stop	Delay (sec / veh):	2,861.5
Analysis Method:	HCM 7th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	3.999

Intersection Setup

Name	Carbon Canyon Road			Carbon Canyon Road			Canyon Hills Road			Canyon Hills Road		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	1	0	0	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	45.00			45.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			No			No		

Volumes

Name	Carbon Canyon Road			Carbon Canyon Road			Canyon Hills Road			Canyon Hills Road		
Base Volume Input [veh/h]	17	532	5	6	1917	32	55	0	49	13	0	16
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	17	532	5	6	1917	32	55	0	49	13	0	16
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	4	140	1	2	504	8	14	0	13	3	0	4
Total Analysis Volume [veh/h]	18	560	5	6	2018	34	58	0	52	14	0	17
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Free	Free	Stop	Stop
Flared Lane			No	No
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance			No	No
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.07	0.01	0.00	0.01	0.02	0.00	4.52	0.00	0.73	4.00	0.00	0.03
d_M, Delay for Movement [s/veh]	19.11	0.00	0.00	8.60	0.00	0.00	2389.95	2286.58	2159.80	2861.50	2014.38	1840.15
Movement LOS	C	A	A	A	A	A	F	F	F	F	F	F
95th-Percentile Queue Length [veh/ln]	0.21	0.00	0.00	0.02	0.00	0.00	14.06	14.06	14.06	5.16	5.16	5.16
95th-Percentile Queue Length [ft/ln]	5.26	0.00	0.00	0.45	0.00	0.00	351.58	351.58	351.58	129.11	129.11	129.11
d_A, Approach Delay [s/veh]	0.59			0.03			2281.15			2301.41		
Approach LOS	A			A			F			F		
d_I, Intersection Delay [s/veh]	115.98											
Intersection LOS	F											

Intersection Level Of Service Report
Intersection 1: Peyton Drive at Chino Avenue

Control Type:	Signalized	Delay (sec / veh):	34.3
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.656

Intersection Setup

Name	Peyton Drive			Peyton Drive			Chino Avenue			Chino Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	0	1	0	0	1	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Peyton Drive			Peyton Drive			Chino Avenue			Chino Avenue		
Base Volume Input [veh/h]	140	763	244	414	979	176	111	335	171	156	168	327
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	140	763	244	414	979	176	111	335	171	156	168	327
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	37	201	64	109	258	46	29	88	45	41	44	86
Total Analysis Volume [veh/h]	147	803	257	436	1031	185	117	353	180	164	177	344
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	115
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	1	6	0	5	2	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	11	35	0	22	46	0	13	39	0	19	45	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	24	0	0	24	0	0	28	0	0	28	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	C	L	C	C	L	C	R
C, Cycle Length [s]	115	115	115	115	115	115	115	115	115	115	115	115
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	7	50	50	17	60	60	9	20	20	12	24	24
g / C, Green / Cycle	0.06	0.43	0.43	0.15	0.52	0.52	0.08	0.18	0.18	0.11	0.20	0.20
(v / s)_i Volume / Saturation Flow Rate	0.04	0.19	0.18	0.13	0.22	0.21	0.07	0.09	0.09	0.09	0.05	0.18
s, saturation flow rate [veh/h]	3400	3800	1900	3400	3800	1900	1800	3800	1900	1800	3800	1900
c, Capacity [veh/h]	204	1640	820	496	1965	983	142	669	334	194	778	389
d1, Uniform Delay [s]	53.13	22.97	22.59	48.16	17.10	16.97	52.21	43.07	43.16	50.41	38.17	44.43
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	4.70	0.86	1.52	5.23	0.65	1.24	11.20	0.65	1.35	9.69	0.15	6.76
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.72	0.44	0.41	0.88	0.42	0.40	0.82	0.53	0.54	0.85	0.23	0.88
d, Delay for Lane Group [s/veh]	57.82	23.84	24.11	53.40	17.75	18.20	63.42	43.72	44.50	60.10	38.31	51.19
Lane Group LOS	E	C	C	D	B	B	E	D	D	E	D	D
Critical Lane Group	No	Yes	No	Yes	No	No	Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	2.22	7.02	6.58	6.47	6.71	6.63	3.77	4.62	4.79	5.15	2.11	10.20
50th-Percentile Queue Length [ft/ln]	55.50	175.47	164.45	161.68	167.63	165.87	94.14	115.60	119.72	128.70	52.69	254.90
95th-Percentile Queue Length [veh/ln]	4.00	11.36	10.78	10.64	10.95	10.86	6.78	8.15	8.38	8.87	3.79	15.43
95th-Percentile Queue Length [ft/ln]	99.90	284.10	269.60	265.94	273.80	271.48	169.46	203.76	209.44	221.73	94.84	385.82

Movement, Approach, & Intersection Results

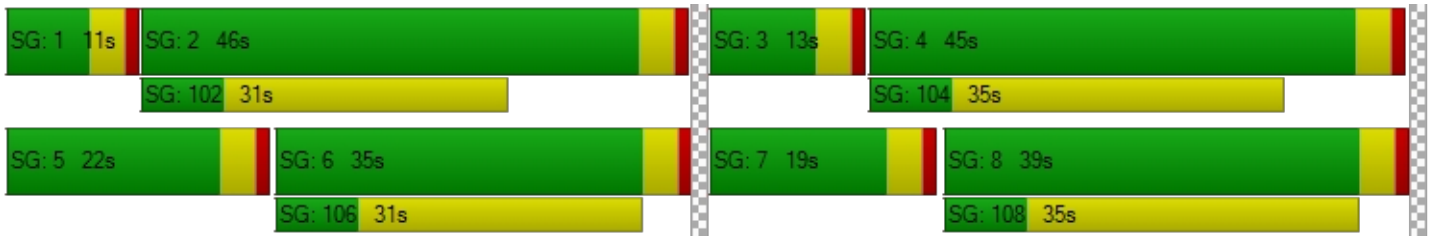
d_M, Delay for Movement [s/veh]	57.82	23.86	24.11	53.40	17.84	18.20	63.42	43.72	44.50	60.10	38.31	51.19
Movement LOS	E	C	C	D	B	B	E	D	D	E	D	D
d_A, Approach Delay [s/veh]	28.05			27.27			47.48			50.00		
Approach LOS	C			C			D			D		
d_I, Intersection Delay [s/veh]	34.34											
Intersection LOS	C											
Intersection V/C	0.656											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	47.05	47.05	47.05	47.05
l_p,int, Pedestrian LOS Score for Intersection	3.052	3.093	2.767	2.847
Crosswalk LOS	C	C	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	539	730	608	713
d_b, Bicycle Delay [s]	30.70	23.19	27.84	23.83
l_b,int, Bicycle LOS Score for Intersection	2.223	2.468	1.917	2.125
Bicycle LOS	B	B	A	B

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 2: Gateway Village/Boys Republic Drive at Grand Avenue

Control Type:	Signalized	Delay (sec / veh):	163.9
Analysis Method:	HCM 7th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.353

Intersection Setup

Name	Boys Republic Drive			Gateway Village			Grand Avenue			Grand Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	1	1	0	0	1	0	0	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			No		

Volumes

Name	Boys Republic Drive			Gateway Village			Grand Avenue			Grand Avenue		
Base Volume Input [veh/h]	14	36	637	290	57	77	121	1465	26	702	1347	140
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	14	36	637	290	57	77	121	1465	26	702	1347	140
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	4	9	168	76	15	20	32	386	7	185	354	37
Total Analysis Volume [veh/h]	15	38	671	305	60	81	127	1542	27	739	1418	147
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Split	Split	Split	Split	Split	Split	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	0	8	0	0	4	0	5	2	0	1	6	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	0	6	0	0	6	0	6	6	0	6	6	0
Maximum Green [s]	0	30	0	0	30	0	30	30	0	30	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	20	0	0	35	0	13	27	0	38	52	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	0	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	24	0	0	14	0	0	11	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall		No			No		No	No		No	No	
Maximum Recall		No			No		No	No		No	No	
Pedestrian Recall		No			No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	R	L	C	L	C	C	L	C	C
C, Cycle Length [s]	120	120	120	120	120	120	120	120	120	120
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	29	29	18	18	9	23	23	34	48	48
g / C, Green / Cycle	0.24	0.24	0.15	0.15	0.08	0.19	0.19	0.28	0.40	0.40
(v / s)_i Volume / Saturation Flow Rate	0.03	0.35	0.13	0.12	0.07	0.27	0.28	0.41	0.27	0.28
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1800	3800	1900	1800	3800	1900
c, Capacity [veh/h]	438	462	265	265	135	733	366	510	1523	762
d1, Uniform Delay [s]	35.41	45.41	49.90	49.68	55.22	48.44	48.44	43.01	29.62	29.82
k, delay calibration	0.11	0.50	0.11	0.11	0.11	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.12	215.23	7.65	6.50	23.69	191.80	224.38	213.03	2.48	5.13
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.12	1.45	0.85	0.83	0.94	1.41	1.47	1.45	0.68	0.69
d, Delay for Lane Group [s/veh]	35.53	260.64	57.55	56.18	78.91	240.24	272.82	256.04	32.10	34.95
Lane Group LOS	D	F	E	E	E	F	F	F	C	C
Critical Lane Group	No	Yes	Yes	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	1.23	41.26	7.18	6.87	4.71	30.43	33.74	45.12	12.72	13.58
50th-Percentile Queue Length [ft/ln]	30.85	1031.54	179.47	171.64	117.73	760.72	843.62	1127.90	318.12	339.41
95th-Percentile Queue Length [veh/ln]	2.22	62.21	11.57	11.16	8.27	46.13	51.30	68.05	18.58	19.62
95th-Percentile Queue Length [ft/ln]	55.53	1555.18	289.32	279.07	206.70	1153.32	1282.47	1701.29	464.38	490.49

Movement, Approach, & Intersection Results

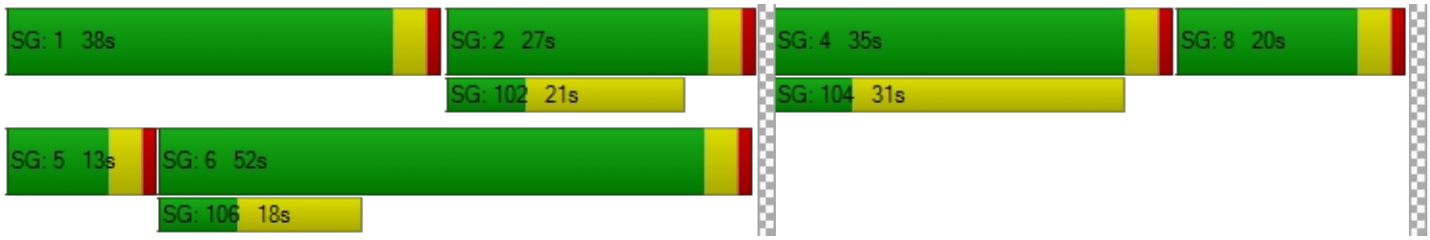
d_M, Delay for Movement [s/veh]	35.53	35.53	260.64	57.19	56.18	56.18	78.91	251.02	272.82	256.04	32.87	34.95
Movement LOS	D	D	F	E	E	E	E	F	F	F	C	C
d_A, Approach Delay [s/veh]	244.16			56.87			238.48			104.58		
Approach LOS	F			E			F			F		
d_I, Intersection Delay [s/veh]	163.94											
Intersection LOS	F											
Intersection V/C	1.353											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	0.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	49.51	49.51	49.51	0.00
l_p,int, Pedestrian LOS Score for Intersection	2.523	2.200	3.055	0.000
Crosswalk LOS	B	B	C	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	267	517	383	800
d_b, Bicycle Delay [s]	45.07	33.01	39.21	21.60
l_b,int, Bicycle LOS Score for Intersection	2.754	2.296	2.492	2.827
Bicycle LOS	C	B	B	C

Sequence

Ring 1	1	2	4	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 3: Peyton Drive at Eucalyptus Avenue

Control Type:	Signalized	Delay (sec / veh):	22.7
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.604

Intersection Setup

Name	Peyton Drive			Peyton Drive			Eucalyptus Avenue			Eucalyptus Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	1	1	0	0	1	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Peyton Drive			Peyton Drive			Eucalyptus Avenue			Eucalyptus Avenue		
Base Volume Input [veh/h]	39	520	206	239	693	344	245	401	28	203	331	231
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	39	520	206	239	693	344	245	401	28	203	331	231
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	10	137	54	63	182	91	64	106	7	53	87	61
Total Analysis Volume [veh/h]	41	547	217	252	729	362	258	422	29	214	348	243
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal Group	1	6	0	5	2	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	6	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	10	29	0	10	29	0	16	41	0	10	35	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	18	0	0	14	0	0	21	0	0	24	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		Yes	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	R	L	C	C	L	C	R
C, Cycle Length [s]	90	90	90	90	90	90	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	0.00	0.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	48	38	38	48	40	40	34	34	24	34	24	24
g / C, Green / Cycle	0.53	0.42	0.42	0.53	0.44	0.44	0.38	0.38	0.27	0.38	0.26	0.26
(v / s)_i Volume / Saturation Flow Rate	0.02	0.14	0.13	0.14	0.19	0.19	0.07	0.07	0.24	0.12	0.18	0.13
s, saturation flow rate [veh/h]	1800	3800	1900	1800	3800	1900	1800	1800	1900	1800	1900	1900
c, Capacity [veh/h]	820	1589	794	897	1678	839	518	685	512	271	502	502
d1, Uniform Delay [s]	10.19	17.70	17.51	11.58	17.40	17.37	18.59	18.59	31.56	19.59	29.88	27.99
k, delay calibration	0.11	0.50	0.50	0.50	0.50	0.50	0.11	0.11	0.15	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.02	0.55	1.00	0.78	0.82	1.62	0.25	0.13	6.86	5.16	1.73	0.72
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.05	0.33	0.31	0.28	0.43	0.43	0.25	0.19	0.88	0.79	0.69	0.48
d, Delay for Lane Group [s/veh]	10.22	18.25	18.51	12.36	18.22	18.99	18.84	18.72	38.42	24.75	31.61	28.71
Lane Group LOS	B	B	B	B	B	B	B	B	D	C	C	C
Critical Lane Group	No	Yes	No	Yes	No	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	0.38	3.64	3.47	2.79	5.18	5.32	1.79	1.78	10.09	3.45	6.87	4.43
50th-Percentile Queue Length [ft/ln]	9.43	90.94	86.64	69.75	129.44	133.03	44.74	44.48	252.26	86.33	171.67	110.86
95th-Percentile Queue Length [veh/ln]	0.68	6.55	6.24	5.02	8.91	9.10	3.22	3.20	15.30	6.22	11.16	7.89
95th-Percentile Queue Length [ft/ln]	16.98	163.70	155.95	125.55	222.74	227.61	80.54	80.06	382.50	155.40	279.10	197.20

Movement, Approach, & Intersection Results

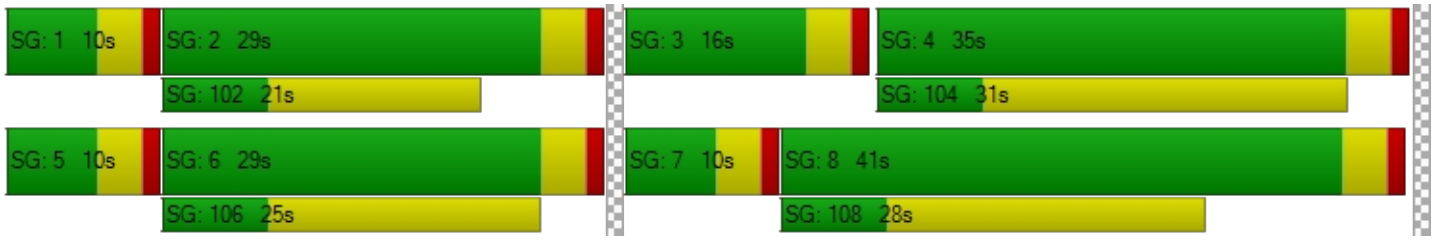
d_M, Delay for Movement [s/veh]	10.22	18.26	18.51	12.36	18.22	18.99	18.83	38.42	38.42	24.75	31.61	28.71
Movement LOS	B	B	B	B	B	B	B	D	D	C	C	C
d_A, Approach Delay [s/veh]	17.92			17.33			31.28			28.91		
Approach LOS	B			B			C			C		
d_I, Intersection Delay [s/veh]	22.71											
Intersection LOS	C											
Intersection V/C	0.604											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	34.72	34.72	34.72	34.72
l_p,int, Pedestrian LOS Score for Intersection	3.046	3.162	2.514	2.788
Crosswalk LOS	C	C	B	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	555	555	821	688
d_b, Bicycle Delay [s]	23.51	23.51	15.64	19.38
l_b,int, Bicycle LOS Score for Intersection	2.002	2.668	2.145	2.888
Bicycle LOS	B	B	B	C

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report

Intersection 4: Rustic Drive/Carbon Canyon Road at Chino Hills Parkway

Control Type:	Signalized	Delay (sec / veh):	93.2
Analysis Method:	HCM 7th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.146

Intersection Setup

Name	Carbon Canyon Road			Rustic Drive			Chino Hills Parkway			Chino Hills Parkway		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	1	0	0	1	0	1	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			No		

Volumes

Name	Carbon Canyon Road			Rustic Drive			Chino Hills Parkway			Chino Hills Parkway		
Base Volume Input [veh/h]	285	1	1950	24	1	1	12	821	210	851	791	35
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	285	1	1950	24	1	1	12	821	210	851	791	35
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	75	0	513	6	0	0	3	216	55	224	208	9
Total Analysis Volume [veh/h]	300	1	2053	25	1	1	13	864	221	896	833	37
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	0	8	0	0	4	0	5	2	0	1	6	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	0	6	0	0	6	0	6	6	0	6	6	0
Maximum Green [s]	0	30	0	0	30	0	30	30	0	30	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	60	0	0	60	0	10	29	0	31	50	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	0	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	21	0	0	18	0	0	11	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall		No			No		No	No		No	No	
Maximum Recall		No			No		No	No		No	No	
Pedestrian Recall		No			No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	L	C	R	L	C	C
C, Cycle Length [s]	120	120	120	120	120	120	120	120	120	120	120
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	56	56	56	56	56	2	25	25	27	50	50
g / C, Green / Cycle	0.47	0.47	0.47	0.47	0.47	0.02	0.21	0.21	0.23	0.42	0.42
(v / s)_i Volume / Saturation Flow Rate	0.17	0.54	0.54	0.01	0.00	0.01	0.23	0.12	0.26	0.23	0.23
s, saturation flow rate [veh/h]	1800	1900	1900	1800	1900	1800	3800	1900	3400	1900	1900
c, Capacity [veh/h]	859	884	884	61	884	33	796	398	766	791	791
d1, Uniform Delay [s]	20.57	32.06	32.06	17.39	17.16	58.19	47.41	42.41	46.46	26.53	26.49
k, delay calibration	0.11	0.50	0.50	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.24	85.24	85.24	4.40	0.00	7.34	57.74	5.50	79.87	2.76	2.73
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.35	1.16	1.16	0.41	0.00	0.39	1.09	0.56	1.17	0.55	0.55
d, Delay for Lane Group [s/veh]	20.82	117.30	117.30	21.79	17.16	65.54	105.14	47.91	126.33	29.29	29.22
Lane Group LOS	C	F	F	C	B	E	F	D	F	C	C
Critical Lane Group	No	Yes	No	No	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	5.43	45.59	45.59	0.45	0.03	0.46	18.20	6.48	19.83	9.99	9.92
50th-Percentile Queue Length [ft/ln]	135.65	1139.65	1139.65	11.31	0.75	11.46	454.93	162.00	495.76	249.74	248.04
95th-Percentile Queue Length [veh/ln]	9.25	63.27	63.27	0.81	0.05	0.83	26.35	10.65	29.50	15.17	15.09
95th-Percentile Queue Length [ft/ln]	231.15	1581.82	1581.82	20.35	1.35	20.63	658.73	266.36	737.38	379.32	377.19

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	20.82	117.30	117.30	21.79	17.16	17.16	65.54	105.14	47.91	126.33	29.25	29.22
Movement LOS	C	F	F	C	B	B	E	F	D	F	C	C
d_A, Approach Delay [s/veh]	105.00			21.45			93.16			78.50		
Approach LOS	F			C			F			E		
d_I, Intersection Delay [s/veh]	93.17											
Intersection LOS	F											
Intersection V/C	1.146											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	0.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	49.49	49.49	49.49	0.00
l_p,int, Pedestrian LOS Score for Intersection	2.991	1.979	3.256	0.000
Crosswalk LOS	C	A	C	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	934	934	417	767
d_b, Bicycle Delay [s]	17.05	17.05	37.59	22.80
l_b,int, Bicycle LOS Score for Intersection	5.444	1.604	2.465	3.017
Bicycle LOS	F	A	B	C

Sequence

Ring 1	1	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 5: Peyton Drive at Chino Hills Parkway

Control Type:	Signalized	Delay (sec / veh):	95.3
Analysis Method:	HCM 7th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.174

Intersection Setup

Name	Peyton Drive			Peyton Drive			Chino Hills Parkway			Chino Hills Parkway		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	1	1	0	0	1	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Peyton Drive			Peyton Drive			Chino Hills Parkway			Chino Hills Parkway		
Base Volume Input [veh/h]	177	300	213	399	448	186	359	1499	454	274	1129	349
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	177	300	213	399	448	186	359	1499	454	274	1129	349
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	47	79	56	105	118	49	94	394	119	72	297	92
Total Analysis Volume [veh/h]	186	316	224	420	472	196	378	1578	478	288	1188	367
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	115
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Overlap	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	3	8	0	7	4	4	5	2	0	1	6	0
Auxiliary Signal Groups						4,5						
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	6	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	30	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	1.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	16	35	0	25	44	44	18	43	0	12	37	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	7	0	7	0	0	7	0
Pedestrian Clearance [s]	0	24	0	0	21	21	0	21	0	0	21	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No	No	No	No		No	No	
Maximum Recall	No	No		No	No	No	No	No		No	No	
Pedestrian Recall	No	No		No	No	No	No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	R	L	C	C	L	C	R
C, Cycle Length [s]	115	115	115	115	115	115	115	115	115	115	115	115
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	8	20	20	21	33	51	14	50	50	8	44	44
g / C, Green / Cycle	0.07	0.18	0.18	0.18	0.29	0.44	0.12	0.43	0.43	0.07	0.38	0.38
(v / s)_i Volume / Saturation Flow Rate	0.05	0.15	0.13	0.23	0.12	0.10	0.11	0.54	0.54	0.08	0.31	0.19
s, saturation flow rate [veh/h]	3400	1900	1900	1800	3800	1900	3400	1900	1900	3400	3800	1900
c, Capacity [veh/h]	251	334	334	329	1083	841	417	820	820	241	1443	721
d1, Uniform Delay [s]	52.27	46.12	45.09	47.05	33.61	19.96	49.87	32.74	32.74	53.50	32.23	27.46
k, delay calibration	0.11	0.13	0.11	0.37	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	4.31	8.05	3.45	140.60	0.28	0.14	7.65	124.37	124.37	96.18	5.44	2.55
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.74	0.86	0.75	1.28	0.44	0.23	0.91	1.25	1.25	1.19	0.82	0.51
d, Delay for Lane Group [s/veh]	56.58	54.18	48.53	187.65	33.88	20.10	57.51	157.12	157.12	149.68	37.68	30.02
Lane Group LOS	E	D	D	F	C	C	E	F	F	F	D	C
Critical Lane Group	No	Yes	No	Yes	No	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	2.78	8.73	7.12	22.23	5.42	3.30	5.80	50.31	50.31	6.71	15.71	8.21
50th-Percentile Queue Length [ft/ln]	69.54	218.30	178.12	555.74	135.55	82.50	144.91	1257.68	1257.68	167.69	392.74	205.16
95th-Percentile Queue Length [veh/ln]	5.01	13.58	11.50	33.59	9.24	5.94	9.74	72.21	72.21	11.56	22.21	12.90
95th-Percentile Queue Length [ft/ln]	125.18	339.46	287.56	839.79	231.02	148.50	243.62	1805.34	1805.34	289.03	555.24	322.62

Movement, Approach, & Intersection Results

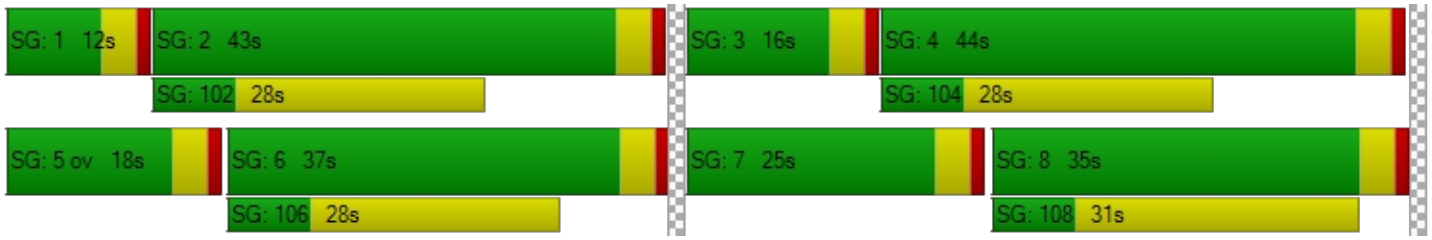
d_M, Delay for Movement [s/veh]	56.58	53.68	48.53	187.65	33.88	20.10	57.51	157.12	157.12	149.68	37.68	30.02
Movement LOS	E	D	D	F	C	C	E	F	F	F	D	C
d_A, Approach Delay [s/veh]	52.84			90.76			141.65			53.65		
Approach LOS	D			F			F			D		
d_I, Intersection Delay [s/veh]	95.35											
Intersection LOS	F											
Intersection V/C	1.174											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	47.07	47.07	47.07	47.07
l_p,int, Pedestrian LOS Score for Intersection	2.784	2.814	3.115	3.172
Crosswalk LOS	C	C	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	539	695	678	574
d_b, Bicycle Delay [s]	30.72	24.49	25.15	29.27
l_b,int, Bicycle LOS Score for Intersection	2.159	2.457	3.568	3.080
Bicycle LOS	B	B	D	C

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 6: Peyton Drive at Woodview Road

Control Type:	All-way stop	Delay (sec / veh):	11.1
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.420

Intersection Setup

Name	Peyton Drive		Woodview Road		Woodview Road	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	1	1	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	45.00		40.00		35.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

Volumes

Name	Peyton Drive		Woodview Road		Woodview Road	
Base Volume Input [veh/h]	236	74	59	89	89	143
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	236	74	59	89	89	143
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	62	19	16	23	23	38
Total Analysis Volume [veh/h]	248	78	62	94	94	151
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	591	737	573	623	702
Degree of Utilization, x	0.42	0.11	0.11	0.15	0.35

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	2.07	0.35	0.36	0.53	1.57
95th-Percentile Queue Length [ft]	51.71	8.84	9.05	13.23	39.13
Approach Delay [s/veh]	11.93		9.60		10.85
Approach LOS	B		A		B
Intersection Delay [s/veh]	11.07				
Intersection LOS	B				

Intersection Level Of Service Report
Intersection 7: Pipeline Avenue at Woodview Road

Control Type:	Two-way stop	Delay (sec / veh):	47.4
Analysis Method:	HCM 7th Edition	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.335

Intersection Setup

Name	Pipeline Avenue		Pipeline Avenue		Woodview Road	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	40.00		30.00		35.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name	Pipeline Avenue		Pipeline Avenue		Woodview Road	
Base Volume Input [veh/h]	208	278	342	71	55	264
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	208	278	342	71	55	264
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	55	73	90	19	14	69
Total Analysis Volume [veh/h]	219	293	360	75	58	278
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.19	0.00	0.00	0.00	0.33	0.43
d_M, Delay for Movement [s/veh]	8.48	0.00	0.00	0.00	47.41	32.15
Movement LOS	A	A	A	A	E	D
95th-Percentile Queue Length [veh/ln]	0.41	0.41	0.00	0.00	6.43	6.43
95th-Percentile Queue Length [ft/ln]	10.37	10.37	0.00	0.00	160.64	160.64
d_A, Approach Delay [s/veh]	3.63		0.00		34.78	
Approach LOS	A		A		D	
d_I, Intersection Delay [s/veh]	10.56					
Intersection LOS	E					

Intersection Level Of Service Report
Intersection 8: Pipeline Avenue at Soquel Canyon Parkway

Control Type:	All-way stop	Delay (sec / veh):	52.4
Analysis Method:	HCM 7th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.057

Intersection Setup

Name	Pipeline Avenue		Soquel Canyon Parkway		Soquel Canyon Parkway	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	1	0	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	40.00		45.00		50.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		No	

Volumes

Name	Pipeline Avenue		Soquel Canyon Parkway		Soquel Canyon Parkway	
Base Volume Input [veh/h]	547	27	18	38	42	485
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	547	27	18	38	42	485
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	144	7	5	10	11	128
Total Analysis Volume [veh/h]	576	28	19	40	44	511
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	604	458	488	488	488	551	551	617
Degree of Utilization, x	1.06	0.04	0.03	0.03	0.03	0.04	0.04	0.83

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	17.21	0.13	0.08	0.08	0.08	0.12	0.12	8.72
95th-Percentile Queue Length [ft]	430.36	3.24	2.10	2.10	2.10	3.11	3.11	217.94
Approach Delay [s/veh]	78.28	10.49				28.77		
Approach LOS	F	B				D		
Intersection Delay [s/veh]	52.44							
Intersection LOS	F							

Intersection Level Of Service Report

Intersection 9: Soquel Canyon Parkway at Los Serranos Country Club Drive/Butterfield Ranch Road

Control Type:	Signalized	Delay (sec / veh):	35.4
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.538

Intersection Setup

Name	Soquel Canyon Parkway			Soquel Canyon Parkway			Lo Se			Butterfield Ranch Road		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	0	1	0	0	1	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Soquel Canyon Parkway			Soquel Canyon Parkway			Lo Se			Butterfield Ranch Road		
Base Volume Input [veh/h]	40	450	152	385	749	263	427	285	43	213	185	326
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	40	450	152	385	749	263	427	285	43	213	185	326
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	11	118	40	101	197	69	112	75	11	56	49	86
Total Analysis Volume [veh/h]	42	474	160	405	788	277	449	300	45	224	195	343
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Overlap
Signal Group	1	6	0	5	2	0	3	8	0	7	4	4
Auxiliary Signal Groups												4,5
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	6
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	30
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	3.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	1.0
Split [s]	29	39	0	20	30	0	22	39	0	22	39	39
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	3.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	7
Pedestrian Clearance [s]	0	28	0	0	18	0	0	28	0	0	28	28
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	2.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	2.0
Minimum Recall	No	No		No	No		No	No		No	No	No
Maximum Recall	No	No		No	No		No	No		No	No	No
Pedestrian Recall	No	No		No	No		No	No		No	No	No
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	C	L	C	C	L	C	R
C, Cycle Length [s]	120	120	120	120	120	120	120	120	120	120	120	120
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	0.00
g_i, Effective Green Time [s]	5	55	55	16	66	66	18	23	23	10	15	35
g / C, Green / Cycle	0.04	0.46	0.46	0.13	0.55	0.55	0.15	0.19	0.19	0.08	0.13	0.29
(v / s)_i Volume / Saturation Flow Rate	0.02	0.11	0.11	0.12	0.19	0.18	0.13	0.09	0.09	0.07	0.10	0.09
s, saturation flow rate [veh/h]	1800	3800	1900	3400	3800	1900	3400	1900	1900	3400	1900	3800
c, Capacity [veh/h]	69	1739	870	455	2101	1051	501	362	362	289	243	1120
d1, Uniform Delay [s]	56.82	19.90	19.79	51.14	14.85	14.56	50.27	43.38	43.18	53.82	50.89	32.81
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	8.22	0.34	0.64	6.20	0.46	0.80	5.90	1.02	0.94	4.47	6.11	0.15
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.61	0.25	0.24	0.89	0.35	0.32	0.90	0.49	0.47	0.78	0.80	0.31
d, Delay for Lane Group [s/veh]	65.04	20.23	20.42	57.34	15.31	15.36	56.17	44.40	44.12	58.29	57.01	32.97
Lane Group LOS	E	C	C	E	B	B	E	D	D	E	E	C
Critical Lane Group	No	Yes	No	Yes	No	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	1.41	3.75	3.64	6.37	5.56	5.11	7.02	4.79	4.56	3.49	6.11	3.91
50th-Percentile Queue Length [ft/ln]	35.34	93.75	91.11	159.24	138.89	127.66	175.48	119.74	113.94	87.32	152.66	97.87
95th-Percentile Queue Length [veh/ln]	2.54	6.75	6.56	10.51	9.42	8.81	11.36	8.38	8.06	6.29	10.16	7.05
95th-Percentile Queue Length [ft/ln]	63.61	168.76	164.00	262.72	235.52	220.31	284.10	209.47	201.46	157.18	253.98	176.17

Movement, Approach, & Intersection Results

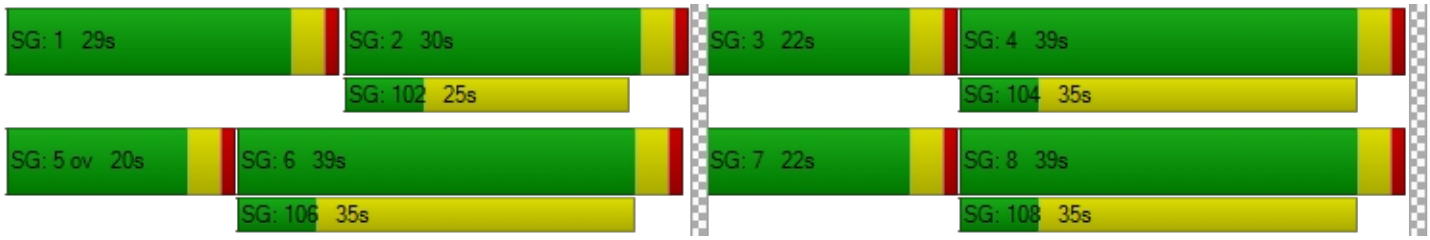
d_M, Delay for Movement [s/veh]	65.04	20.25	20.42	57.34	15.31	15.36	56.17	44.28	44.12	58.29	57.01	32.97
Movement LOS	E	C	C	E	B	B	E	D	D	E	E	C
d_A, Approach Delay [s/veh]	23.08			26.90			51.00			46.56		
Approach LOS	C			C			D			D		
d_I, Intersection Delay [s/veh]	35.42											
Intersection LOS	D											
Intersection V/C	0.538											

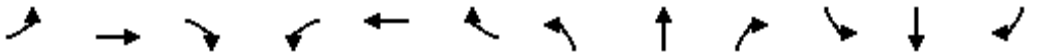
Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	49.52	49.52	49.52	49.52
l_p,int, Pedestrian LOS Score for Intersection	2.849	3.073	2.569	2.938
Crosswalk LOS	C	C	B	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	583	433	583	583
d_b, Bicycle Delay [s]	30.12	36.83	30.12	30.12
l_b,int, Bicycle LOS Score for Intersection	1.931	2.368	2.215	2.817
Bicycle LOS	A	B	B	C

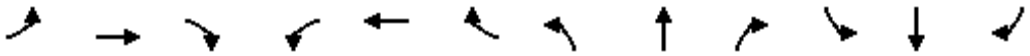
Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-





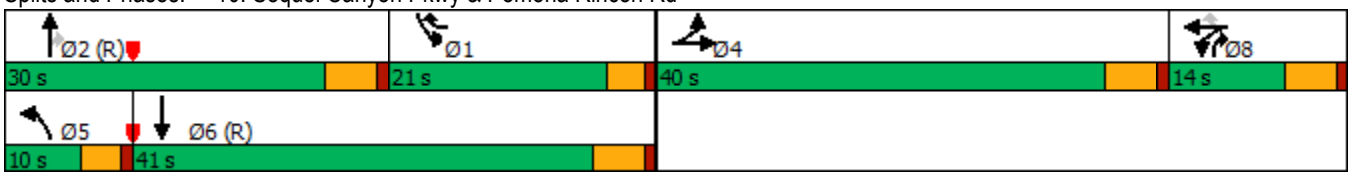
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	72	32	12	176	4	490	34	914	293	750	1188	72
Future Volume (vph)	72	32	12	176	4	490	34	914	293	750	1188	72
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	0.95	0.91	0.95	1.00	0.86	0.86	0.97	0.91	0.91
Frt		0.960			0.863	0.850		0.995	0.850		0.991	
Flt Protected	0.950			0.950	0.997		0.950			0.950		
Satd. Flow (prot)	1770	1788	0	1681	1458	1504	1770	4782	1362	3433	5040	0
Flt Permitted	0.950			0.950	0.997		0.950			0.950		
Satd. Flow (perm)	1770	1788	0	1681	1458	1504	1770	4782	1362	3433	5040	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		13			261	283		4	293		10	
Link Speed (mph)		25			25			50			50	
Link Distance (ft)		560			625			594			526	
Travel Time (s)		15.3			17.0			8.1			7.2	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	80	36	13	196	4	544	38	1016	326	833	1320	80
Shared Lane Traffic (%)				10%		48%			10%			
Lane Group Flow (vph)	80	49	0	176	285	283	38	1049	293	833	1400	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2	1	1	2	1	1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100		20	100	20	20	100	20	20	100	
Trailing Detector (ft)	0	0		0	0	0	0	0	0	0	0	
Detector 1 Position(ft)	0	0		0	0	0	0	0	0	0	0	
Detector 1 Size(ft)	20	6		20	6	20	20	6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Split	NA		Split	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	
Protected Phases	4	4		8	8	1	5	2	8	1	6	
Permitted Phases						8			2			
Detector Phase	4	4		8	8	1	5	2	8	1	6	
Switch Phase												
Minimum Initial (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	

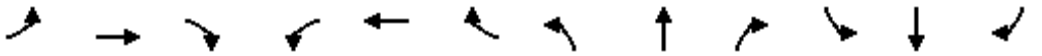


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Split (s)	40.0	40.0		11.0	11.0	10.0	10.0	30.0	11.0	10.0	23.0	
Total Split (s)	40.0	40.0		14.0	14.0	21.0	10.0	30.0	14.0	21.0	41.0	
Total Split (%)	38.1%	38.1%		13.3%	13.3%	20.0%	9.5%	28.6%	13.3%	20.0%	39.0%	
Maximum Green (s)	35.0	35.0		9.0	9.0	17.0	6.0	25.0	9.0	17.0	36.0	
Yellow Time (s)	4.0	4.0		4.0	4.0	3.0	3.0	4.0	4.0	3.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0	4.0	4.0	5.0	5.0	4.0	5.0	
Lead/Lag						Lag	Lead	Lead		Lag	Lag	
Lead-Lag Optimize?						Yes	Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	None		None	None	None	None	C-Max	None	None	C-Max	
Walk Time (s)	7.0	7.0						7.0			7.0	
Flash Dont Walk (s)	28.0	28.0						18.0			11.0	
Pedestrian Calls (#/hr)	5	5						5			5	
Act Effct Green (s)	14.3	14.3		20.6	20.6	39.4	7.0	36.4	61.9	17.0	50.5	
Actuated g/C Ratio	0.14	0.14		0.20	0.20	0.38	0.07	0.35	0.59	0.16	0.48	
v/c Ratio	0.33	0.19		0.53	0.58	0.38	0.32	0.63	0.32	1.50	0.58	
Control Delay	41.4	29.3		47.2	12.6	3.4	54.5	32.5	3.3	267.6	23.2	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	41.4	29.3		47.2	12.6	3.4	54.5	32.5	3.3	267.6	23.2	
LOS	D	C		D	B	A	D	C	A	F	C	
Approach Delay		36.8			17.3			26.9			114.4	
Approach LOS		D			B			C			F	
Queue Length 50th (ft)	52	23		109	14	0	25	227	0	~401	262	
Queue Length 95th (ft)	72	43		#297	#151	35	59	#355	62	#522	367	
Internal Link Dist (ft)		480			545			514			446	
Turn Bay Length (ft)												
Base Capacity (vph)	590	604		329	495	740	117	1659	923	555	2430	
Starvation Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.14	0.08		0.53	0.58	0.38	0.32	0.63	0.32	1.50	0.58	

Intersection Summary			
Area Type:	Other		
Cycle Length: 105			
Actuated Cycle Length: 105			
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green			
Natural Cycle: 115			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.50			
Intersection Signal Delay: 69.1		Intersection LOS: E	
Intersection Capacity Utilization 72.0%		ICU Level of Service C	
Analysis Period (min) 15			
~ Volume exceeds capacity, queue is theoretically infinite.			
Queue shown is maximum after two cycles.			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 10: Soquel Canyon Pkwy & Pomona Rincon Rd





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	72	32	12	176	4	490	34	914	293	750	1188	72
Future Volume (veh/h)	72	32	12	176	4	490	34	914	293	750	1188	72
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	80	36	13	132	0	615	38	1016	326	833	1320	80
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	117	86	31	153	0	1602	68	1336	513	1451	3097	188
Arrive On Green	0.07	0.07	0.07	0.09	0.00	0.09	0.04	0.24	0.24	0.42	0.63	0.63
Sat Flow, veh/h	1781	1312	474	1781	0	3170	1781	5611	1585	3456	4922	298
Grp Volume(v), veh/h	80	0	49	132	0	615	38	1016	326	833	913	487
Grp Sat Flow(s),veh/h/ln	1781	0	1785	1781	0	1585	1781	1870	1585	1728	1702	1817
Q Serve(g_s), s	4.6	0.0	2.8	7.7	0.0	0.0	2.2	17.7	18.4	19.4	14.3	14.3
Cycle Q Clear(g_c), s	4.6	0.0	2.8	7.7	0.0	0.0	2.2	17.7	18.4	19.4	14.3	14.3
Prop In Lane	1.00		0.27	1.00		1.00	1.00		1.00	1.00		0.16
Lane Grp Cap(c), veh/h	117	0	118	153	0	1602	68	1336	513	1451	2142	1143
V/C Ratio(X)	0.68	0.00	0.42	0.86	0.00	0.38	0.56	0.76	0.64	0.57	0.43	0.43
Avail Cap(c_a), veh/h	594	0	595	153	0	1602	102	1336	513	1451	2142	1143
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	48.0	0.0	47.1	47.4	0.0	15.9	49.6	37.2	30.2	23.3	9.9	9.9
Incr Delay (d2), s/veh	6.8	0.0	2.3	36.9	0.0	0.2	6.9	4.1	5.9	0.6	0.6	1.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.3	0.0	1.3	5.0	0.0	4.5	1.1	8.1	8.4	7.3	4.6	5.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	54.7	0.0	49.4	84.3	0.0	16.1	56.6	41.3	36.1	23.8	10.5	11.0
LnGrp LOS	D	A	D	F	A	B	E	D	D	C	B	B
Approach Vol, veh/h		129			747			1380			2233	
Approach Delay, s/veh		52.7			28.1			40.5			15.6	
Approach LOS		D			C			D			B	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	49.1	30.0		11.9	8.0	71.1		14.0				
Change Period (Y+Rc), s	5.0	* 5		5.0	4.0	5.0		5.0				
Max Green Setting (Gmax), s	17.0	* 25		35.0	6.0	36.0		9.0				
Max Q Clear Time (g_c+I1), s	21.4	20.4		6.6	4.2	16.3		9.7				
Green Ext Time (p_c), s	0.0	2.9		0.5	0.0	8.6		0.0				

Intersection Summary			
HCM 6th Ctrl Delay		26.4	
HCM 6th LOS		C	

Notes

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection Level Of Service Report
Intersection 11: Peyton Drive at Grand Avenue

Control Type:	Signalized	Delay (sec / veh):	39.6
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.723

Intersection Setup

Name	Peyton Drive			Peyton Drive			Grand Avenue			Grand Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	1	0	0	1	0	1	1	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Peyton Drive			Peyton Drive			Grand Avenue			Grand Avenue		
Base Volume Input [veh/h]	178	730	188	238	735	205	366	1117	183	275	619	282
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	178	730	188	238	735	205	366	1117	183	275	619	282
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	47	192	49	63	193	54	96	294	48	72	163	74
Total Analysis Volume [veh/h]	187	768	198	251	774	216	385	1176	193	289	652	297
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	1	6	0	5	2	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	12	39	0	14	41	0	28	51	0	16	39	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	28	0	0	24	0	0	31	0	0	28	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	C	L	C	R	L	C	R
C, Cycle Length [s]	120	120	120	120	120	120	120	120	120	120	120	120
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	8	41	41	10	43	43	16	41	41	12	37	37
g / C, Green / Cycle	0.07	0.34	0.34	0.08	0.36	0.36	0.13	0.34	0.34	0.10	0.31	0.31
(v / s)_i Volume / Saturation Flow Rate	0.06	0.13	0.10	0.07	0.18	0.17	0.11	0.31	0.10	0.09	0.17	0.16
s, saturation flow rate [veh/h]	3400	5700	1900	3400	3800	1900	3400	3800	1900	3400	3800	1900
c, Capacity [veh/h]	231	1941	647	287	1357	679	458	1294	647	344	1167	583
d1, Uniform Delay [s]	55.20	30.18	29.15	54.35	30.17	29.79	50.73	37.82	29.07	53.05	34.81	34.18
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	6.59	0.61	1.22	8.15	1.30	2.30	4.25	2.80	0.26	5.56	0.42	0.69
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.81	0.40	0.31	0.87	0.50	0.47	0.84	0.91	0.30	0.84	0.56	0.51
d, Delay for Lane Group [s/veh]	61.80	30.79	30.38	62.50	31.47	32.08	54.98	40.62	29.32	58.60	35.23	34.87
Lane Group LOS	E	C	C	E	C	C	D	D	C	E	D	C
Critical Lane Group	Yes	No	No	No	Yes	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	3.00	5.76	4.44	4.07	7.84	7.48	5.91	16.75	4.14	4.55	8.02	7.22
50th-Percentile Queue Length [ft/ln]	75.10	144.01	111.04	101.86	195.92	186.90	147.81	418.70	103.60	113.68	200.44	180.57
95th-Percentile Queue Length [veh/ln]	5.41	9.70	7.90	7.33	12.43	11.96	9.90	23.46	7.46	8.04	12.66	11.63
95th-Percentile Queue Length [ft/ln]	135.18	242.41	197.45	183.35	310.69	299.01	247.50	586.49	186.49	201.11	316.53	290.76

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	61.80	30.79	30.38	62.50	31.55	32.08	54.98	40.62	29.32	58.60	35.23	34.87
Movement LOS	E	C	C	E	C	C	D	D	C	E	D	C
d_A, Approach Delay [s/veh]	35.75			37.90			42.53			40.60		
Approach LOS	D			D			D			D		
d_I, Intersection Delay [s/veh]	39.57											
Intersection LOS	D											
Intersection V/C	0.723											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	49.54	49.54	49.54	49.54
l_p,int, Pedestrian LOS Score for Intersection	3.124	3.067	2.999	3.088
Crosswalk LOS	C	C	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	583	616	783	583
d_b, Bicycle Delay [s]	30.13	28.73	22.23	30.13
l_b,int, Bicycle LOS Score for Intersection	2.194	2.242	3.007	2.581
Bicycle LOS	B	B	C	B

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 12: Carbon Canyon Road at Fairway Drive/Ginseng Lane

Control Type:	Two-way stop	Delay (sec / veh):	1,799.1
Analysis Method:	HCM 7th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	2.788

Intersection Setup

Name	Carbon Canyon Road			Carbon Canyon Road			Fairway Drive			Ginseng Lane		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	0	0	0	1	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	45.00			45.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			No			No		

Volumes

Name	Carbon Canyon Road			Carbon Canyon Road			Fairway Drive			Ginseng Lane		
Base Volume Input [veh/h]	8	1975	4	9	843	12	19	0	14	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	8	1975	4	9	843	12	19	0	14	0	0	0
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	520	1	2	222	3	5	0	4	0	0	0
Total Analysis Volume [veh/h]	8	2079	4	9	887	13	20	0	15	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Free	Free	Stop	Stop
Flared Lane				No
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance			No	No
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.02	0.00	0.03	0.01	0.00	2.79	0.00	0.04	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	9.82	0.00	0.00	19.03	0.00	0.00	1799.14	1607.95	16.07	536.82	317.87	58.77
Movement LOS	A	A	A	C	A	A	F	F	C	F	F	F
95th-Percentile Queue Length [veh/ln]	0.03	0.00	0.00	0.10	0.00	0.00	3.66	3.66	0.14	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	0.80	0.00	0.00	2.62	0.00	0.00	91.38	91.38	3.45	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	0.04			0.19			1034.97			304.49		
Approach LOS	A			A			F			F		
d_I, Intersection Delay [s/veh]	12.02											
Intersection LOS	F											

Intersection Level Of Service Report
Intersection 13: Carbon Canyon Road at Canyon Hills Road

Control Type:	Two-way stop	Delay (sec / veh):	3,604.4
Analysis Method:	HCM 7th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	6.781

Intersection Setup

Name	Carbon Canyon Road			Carbon Canyon Road			Canyon Hills Road			Canyon Hills Road		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	1	0	0	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	45.00			45.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			No			No		

Volumes

Name	Carbon Canyon Road			Carbon Canyon Road			Canyon Hills Road			Canyon Hills Road		
Base Volume Input [veh/h]	27	1973	15	19	764	60	38	0	32	8	0	11
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	27	1973	15	19	764	60	38	0	32	8	0	11
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	7	519	4	5	201	16	10	0	8	2	0	3
Total Analysis Volume [veh/h]	28	2077	16	20	804	63	40	0	34	8	0	12
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Free	Free	Stop	Stop
Flared Lane			No	No
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance			No	No
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.04	0.02	0.00	0.08	0.01	0.00	6.78	0.00	0.09	1.25	0.00	0.18
d_M, Delay for Movement [s/veh]	9.81	0.00	0.00	19.80	0.00	0.00	3604.41	3303.07	3003.92	1081.00	839.45	573.34
Movement LOS	A	A	A	C	A	A	F	F	F	F	F	F
95th-Percentile Queue Length [veh/ln]	0.11	0.00	0.00	0.24	0.00	0.00	10.54	10.54	10.54	3.14	3.14	3.14
95th-Percentile Queue Length [ft/ln]	2.80	0.00	0.00	6.12	0.00	0.00	263.44	263.44	263.44	78.48	78.48	78.48
d_A, Approach Delay [s/veh]	0.13			0.45			3328.51			776.41		
Approach LOS	A			A			F			F		
d_I, Intersection Delay [s/veh]	84.63											
Intersection LOS	F											

APPENDIX F-II

YEAR 2040 WITH PROJECT TRAFFIC CONDITIONS

Intersection Level Of Service Report
Intersection 1: Peyton Drive at Chino Avenue

Control Type:	Signalized	Delay (sec / veh):	37.8
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.520

Intersection Setup

Name	Peyton Drive			Peyton Drive			Chino Avenue			Chino Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	0	1	0	0	1	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Peyton Drive			Peyton Drive			Chino Avenue			Chino Avenue		
Base Volume Input [veh/h]	192	607	143	171	492	239	268	383	150	128	356	142
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	192	607	143	171	492	239	268	383	150	128	356	142
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	51	160	38	45	129	63	71	101	39	34	94	37
Total Analysis Volume [veh/h]	202	639	151	180	518	252	282	403	158	135	375	149
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	1	6	0	5	2	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	12	35	0	12	35	0	34	39	0	34	39	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	24	0	0	24	0	0	28	0	0	28	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	C	L	C	C	L	C	R
C, Cycle Length [s]	120	120	120	120	120	120	120	120	120	120	120	120
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	8	60	60	8	60	60	21	25	25	11	15	15
g / C, Green / Cycle	0.07	0.50	0.50	0.07	0.50	0.50	0.17	0.21	0.21	0.09	0.12	0.12
(v / s)_i Volume / Saturation Flow Rate	0.06	0.14	0.13	0.05	0.14	0.13	0.16	0.10	0.09	0.08	0.10	0.08
s, saturation flow rate [veh/h]	3400	3800	1900	3400	3800	1900	1800	3800	1900	1800	3800	1900
c, Capacity [veh/h]	229	1907	954	229	1907	954	314	781	391	165	468	234
d1, Uniform Delay [s]	55.52	17.33	17.22	55.14	17.25	17.17	48.52	42.13	41.80	53.52	51.21	50.09
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.18	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	10.60	0.37	0.69	5.88	0.35	0.68	13.78	0.48	0.83	9.37	3.24	2.86
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.88	0.28	0.27	0.79	0.27	0.26	0.90	0.49	0.46	0.82	0.80	0.64
d, Delay for Lane Group [s/veh]	66.11	17.70	17.91	61.02	17.60	17.85	62.31	42.60	42.63	62.89	54.45	52.95
Lane Group LOS	E	B	B	E	B	B	E	D	D	E	D	D
Critical Lane Group	Yes	No	No	No	Yes	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	3.37	4.35	4.24	2.87	4.20	4.16	9.44	5.08	4.73	4.43	5.69	4.45
50th-Percentile Queue Length [ft/ln]	84.19	108.75	106.10	71.73	105.05	104.00	236.11	126.92	118.28	110.74	142.34	111.20
95th-Percentile Queue Length [veh/ln]	6.06	7.77	7.62	5.16	7.56	7.49	14.48	8.77	8.30	7.88	9.61	7.91
95th-Percentile Queue Length [ft/ln]	151.55	194.27	190.56	129.11	189.09	187.20	362.11	219.30	207.46	197.04	240.18	197.67

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	66.11	17.73	17.91	61.02	17.60	17.85	62.31	42.61	42.63	62.89	54.45	52.95
Movement LOS	E	B	B	E	B	B	E	D	D	E	D	D
d_A, Approach Delay [s/veh]	27.61			25.89			49.20			55.84		
Approach LOS	C			C			D			E		
d_I, Intersection Delay [s/veh]	37.82											
Intersection LOS	D											
Intersection V/C	0.520											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	49.52	49.52	49.52	49.52
l_p,int, Pedestrian LOS Score for Intersection	2.959	2.985	2.841	2.802
Crosswalk LOS	C	C	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	517	517	583	583
d_b, Bicycle Delay [s]	33.02	33.02	30.12	30.12
l_b,int, Bicycle LOS Score for Intersection	2.105	2.082	2.023	2.103
Bicycle LOS	B	B	B	B

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 2: Gateway Village/Boys Republic Drive at Grand Avenue

Control Type:	Signalized	Delay (sec / veh):	50.1
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.938

Intersection Setup

Name	Boys Republic Drive			Gateway Village			Grand Avenue			Grand Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	1	1	0	0	1	0	0	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			No		

Volumes

Name	Boys Republic Drive			Gateway Village			Grand Avenue			Grand Avenue		
Base Volume Input [veh/h]	56	30	499	92	37	39	55	801	16	567	1288	86
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	56	30	499	92	37	39	55	801	16	567	1288	86
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	15	8	131	24	10	10	14	211	4	149	339	23
Total Analysis Volume [veh/h]	59	32	525	97	39	41	58	843	17	597	1356	91
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Split	Split	Split	Split	Split	Split	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	0	8	0	0	4	0	5	2	0	1	6	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	0	6	0	0	6	0	6	6	0	6	6	0
Maximum Green [s]	0	30	0	0	30	0	30	30	0	30	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	15	0	0	35	0	11	25	0	45	59	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	0	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	24	0	0	14	0	0	11	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall		No			No		No	No		No	No	
Maximum Recall		No			No		No	No		No	No	
Pedestrian Recall		No			No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	R	L	C	L	C	C	L	C	C
C, Cycle Length [s]	120	120	120	120	120	120	120	120	120	120
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	34	34	8	8	5	21	21	41	57	57
g / C, Green / Cycle	0.28	0.28	0.07	0.07	0.04	0.18	0.18	0.34	0.47	0.47
(v / s)_i Volume / Saturation Flow Rate	0.05	0.28	0.05	0.05	0.03	0.15	0.15	0.33	0.25	0.26
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1800	3800	1900	1800	3800	1900
c, Capacity [veh/h]	505	533	123	123	77	669	335	615	1805	902
d1, Uniform Delay [s]	32.71	42.91	54.81	54.75	56.81	47.85	48.19	38.91	22.11	22.28
k, delay calibration	0.11	0.44	0.11	0.11	0.11	0.50	0.50	0.44	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.17	33.11	7.93	7.41	13.70	12.43	26.44	27.68	1.12	2.34
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.18	0.98	0.73	0.71	0.75	0.84	0.88	0.97	0.53	0.54
d, Delay for Lane Group [s/veh]	32.88	76.02	62.74	62.15	70.51	60.28	74.63	66.60	23.23	24.61
Lane Group LOS	C	E	E	E	E	E	E	E	C	C
Critical Lane Group	No	Yes	Yes	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	2.04	20.19	2.92	2.85	2.03	9.33	11.03	21.76	9.65	10.23
50th-Percentile Queue Length [ft/ln]	51.10	504.86	73.06	71.15	50.81	233.19	275.71	543.88	241.20	255.84
95th-Percentile Queue Length [veh/ln]	3.68	27.56	5.26	5.12	3.66	14.34	16.47	29.40	14.74	15.48
95th-Percentile Queue Length [ft/ln]	91.98	689.10	131.50	128.07	91.46	358.40	411.87	735.11	368.55	387.00

Movement, Approach, & Intersection Results

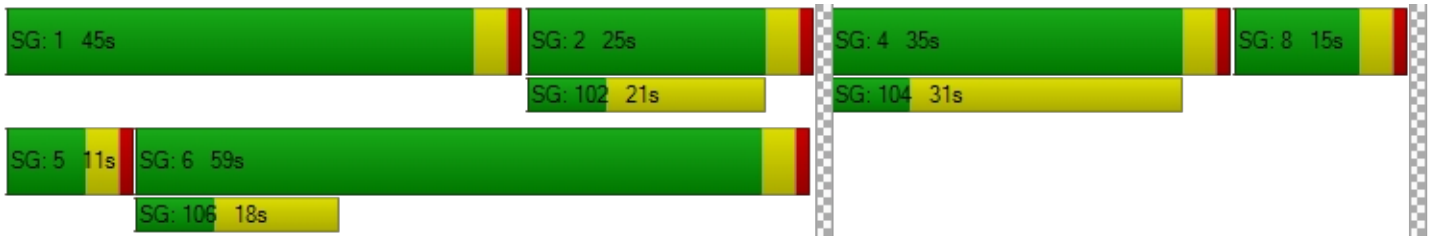
d_M, Delay for Movement [s/veh]	32.88	32.88	76.02	62.69	62.15	62.15	70.51	65.00	74.63	66.60	23.64	24.61
Movement LOS	C	C	E	E	E	E	E	E	E	E	C	C
d_A, Approach Delay [s/veh]	69.65			62.45			65.53			36.23		
Approach LOS	E			E			E			D		
d_I, Intersection Delay [s/veh]	50.11											
Intersection LOS	D											
Intersection V/C	0.938											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	0.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	49.50	49.50	49.50	0.00
l_p,int, Pedestrian LOS Score for Intersection	2.454	2.070	2.938	0.000
Crosswalk LOS	B	B	C	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	183	517	350	917
d_b, Bicycle Delay [s]	49.50	33.00	40.84	17.60
l_b,int, Bicycle LOS Score for Intersection	2.576	1.852	2.065	2.684
Bicycle LOS	B	A	B	B

Sequence

Ring 1	1	2	4	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 3: Peyton Drive at Eucalyptus Avenue

Control Type:	Signalized	Delay (sec / veh):	19.5
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.506

Intersection Setup

Name	Peyton Drive			Peyton Drive			Eucalyptus Avenue			Eucalyptus Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	1	1	0	0	1	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Peyton Drive			Peyton Drive			Eucalyptus Avenue			Eucalyptus Avenue		
Base Volume Input [veh/h]	22	703	126	206	613	270	301	135	22	192	167	300
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	22	703	126	206	613	270	301	135	22	192	167	300
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	6	185	33	54	161	71	79	36	6	51	44	79
Total Analysis Volume [veh/h]	23	740	133	217	645	284	317	142	23	202	176	316
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal Group	1	6	0	5	2	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	6	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	10	29	0	10	29	0	10	41	0	10	41	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	18	0	0	14	0	0	21	0	0	24	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		Yes	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	R	L	C	C	L	C	R
C, Cycle Length [s]	90	90	90	90	90	90	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	0.00	0.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	57	47	47	57	50	50	25	25	15	25	15	15
g / C, Green / Cycle	0.63	0.52	0.52	0.63	0.56	0.56	0.28	0.28	0.17	0.28	0.17	0.17
(v / s)_i Volume / Saturation Flow Rate	0.01	0.15	0.15	0.12	0.17	0.15	0.09	0.09	0.09	0.11	0.14	0.12
s, saturation flow rate [veh/h]	1800	3800	1900	1800	3800	1900	1800	1800	1900	1800	1900	1900
c, Capacity [veh/h]	1074	1967	983	1083	2107	1054	404	506	323	372	325	325
d1, Uniform Delay [s]	6.27	12.41	12.36	7.04	10.77	10.52	25.51	25.51	34.03	26.20	35.85	35.37
k, delay calibration	0.11	0.50	0.50	0.50	0.50	0.50	0.49	0.49	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.01	0.39	0.75	0.42	0.38	0.63	2.81	1.59	1.25	1.24	4.35	3.06
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.02	0.30	0.29	0.20	0.31	0.27	0.39	0.31	0.51	0.54	0.79	0.72
d, Delay for Lane Group [s/veh]	6.28	12.79	13.12	7.45	11.15	11.15	28.32	27.10	35.28	27.43	40.20	38.43
Lane Group LOS	A	B	B	A	B	B	C	C	D	C	D	D
Critical Lane Group	No	Yes	No	Yes	No	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.15	3.28	3.31	1.70	3.31	2.93	2.94	2.85	3.35	3.56	5.71	5.07
50th-Percentile Queue Length [ft/ln]	3.77	81.93	82.77	42.44	82.70	73.33	73.53	71.24	83.65	89.12	142.75	126.73
95th-Percentile Queue Length [veh/ln]	0.27	5.90	5.96	3.06	5.95	5.28	5.29	5.13	6.02	6.42	9.63	8.76
95th-Percentile Queue Length [ft/ln]	6.79	147.48	148.99	76.40	148.86	131.99	132.35	128.23	150.57	160.41	240.72	219.04

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	6.28	12.86	13.12	7.45	11.15	11.15	27.72	35.28	35.28	27.43	40.20	38.85
Movement LOS	A	B	B	A	B	B	C	D	D	C	D	D
d_A, Approach Delay [s/veh]	12.73			10.45			30.30			35.88		
Approach LOS	B			B			C			D		
d_I, Intersection Delay [s/veh]	19.54											
Intersection LOS	B											
Intersection V/C	0.506											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	34.72	34.72	34.72	34.72
l_p,int, Pedestrian LOS Score for Intersection	3.027	3.213	2.385	2.698
Crosswalk LOS	C	C	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	555	555	821	821
d_b, Bicycle Delay [s]	23.51	23.51	15.64	15.64
l_b,int, Bicycle LOS Score for Intersection	2.052	2.505	1.957	2.705
Bicycle LOS	B	B	A	B

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 4: Rustic Drive/Carbon Canyon Road at Chino Hills Parkway

Control Type:	Signalized	Delay (sec / veh):	96.5
Analysis Method:	HCM 7th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.071

Intersection Setup

Name	Carbon Canyon Road			Rustic Drive			Chino Hills Parkway			Chino Hills Parkway		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	1	0	0	1	0	1	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			No		

Volumes

Name	Carbon Canyon Road			Rustic Drive			Chino Hills Parkway			Chino Hills Parkway		
Base Volume Input [veh/h]	238	1	674	31	1	1	17	396	324	1929	823	9
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	238	1	674	31	1	1	17	396	324	1929	823	9
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	63	0	177	8	0	0	4	104	85	508	217	2
Total Analysis Volume [veh/h]	251	1	709	33	1	1	18	417	341	2031	866	9
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	0	8	0	0	4	0	5	2	0	1	6	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	0	6	0	0	6	0	6	6	0	6	6	0
Maximum Green [s]	0	30	0	0	30	0	30	30	0	30	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	32	0	0	32	0	10	29	0	59	78	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	0	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	21	0	0	18	0	0	11	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall		No			No		No	No		No	No	
Maximum Recall		No			No		No	No		No	No	
Pedestrian Recall		No			No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	L	C	R	L	C	C
C, Cycle Length [s]	120	120	120	120	120	120	120	120	120	120	120
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	25	25	25	25	25	3	28	28	55	80	80
g / C, Green / Cycle	0.21	0.21	0.21	0.21	0.21	0.02	0.23	0.23	0.46	0.67	0.67
(v / s)_i Volume / Saturation Flow Rate	0.14	0.19	0.19	0.02	0.00	0.01	0.11	0.18	0.60	0.23	0.23
s, saturation flow rate [veh/h]	1800	1900	1900	1800	1900	1800	3800	1900	3400	1900	1900
c, Capacity [veh/h]	403	396	396	78	396	41	889	444	1556	1270	1270
d1, Uniform Delay [s]	43.66	46.21	46.21	38.28	37.61	57.84	39.55	42.91	32.53	8.57	8.57
k, delay calibration	0.13	0.27	0.27	0.11	0.11	0.11	0.50	0.50	0.21	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.83	15.57	15.57	3.58	0.00	7.06	1.78	12.00	139.46	0.74	0.74
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.62	0.90	0.90	0.42	0.01	0.44	0.47	0.77	1.31	0.34	0.34
d, Delay for Lane Group [s/veh]	45.49	61.78	61.78	41.86	37.62	64.89	41.33	54.91	171.99	9.31	9.31
Lane Group LOS	D	E	E	D	D	E	D	D	F	A	A
Critical Lane Group	No	Yes	No	No	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	7.06	11.97	11.97	0.87	0.05	0.62	5.53	10.90	51.91	4.90	4.90
50th-Percentile Queue Length [ft/ln]	176.42	299.25	299.24	21.69	1.19	15.52	138.19	272.51	1297.72	122.51	122.51
95th-Percentile Queue Length [veh/ln]	11.41	17.64	17.64	1.56	0.09	1.12	9.38	16.31	76.11	8.53	8.53
95th-Percentile Queue Length [ft/ln]	285.34	441.10	441.08	39.04	2.14	27.93	234.59	407.87	1902.82	213.26	213.26

Movement, Approach, & Intersection Results

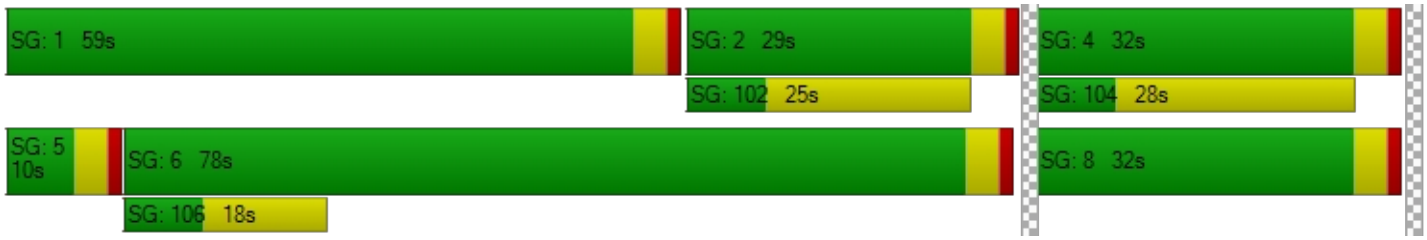
d_M, Delay for Movement [s/veh]	45.49	61.78	61.78	41.86	37.62	37.62	64.89	41.33	54.91	171.99	9.31	9.31
Movement LOS	D	E	E	D	D	D	E	D	D	F	A	A
d_A, Approach Delay [s/veh]	57.53			41.61			47.84			123.01		
Approach LOS	E			D			D			F		
d_I, Intersection Delay [s/veh]	96.48											
Intersection LOS	F											
Intersection V/C	1.071											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	0.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	49.50	49.50	49.50	0.00
l_p,int, Pedestrian LOS Score for Intersection	2.964	1.974	3.131	0.000
Crosswalk LOS	C	A	C	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	467	467	417	1234
d_b, Bicycle Delay [s]	35.26	35.26	37.60	8.81
l_b,int, Bicycle LOS Score for Intersection	3.145	1.617	2.200	3.957
Bicycle LOS	C	A	B	D

Sequence

Ring 1	1	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 5: Peyton Drive at Chino Hills Parkway

Control Type:	Signalized	Delay (sec / veh):	43.6
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.948

Intersection Setup

Name	Peyton Drive			Peyton Drive			Chino Hills Parkway			Chino Hills Parkway		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	1	1	0	0	1	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Peyton Drive			Peyton Drive			Chino Hills Parkway			Chino Hills Parkway		
Base Volume Input [veh/h]	607	413	307	201	225	401	219	648	155	210	1357	287
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	607	413	307	201	225	401	219	648	155	210	1357	287
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	160	109	81	53	59	106	58	171	41	55	357	76
Total Analysis Volume [veh/h]	639	435	323	212	237	422	231	682	163	221	1428	302
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Overlap	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	3	8	0	7	4	4	5	2	0	1	6	0
Auxiliary Signal Groups						4,5						
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	6	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	30	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	1.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	43	55	0	20	32	32	13	32	0	13	32	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	7	0	7	0	0	7	0
Pedestrian Clearance [s]	0	24	0	0	21	21	0	21	0	0	21	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No	No	No	No		No	No	
Maximum Recall	No	No		No	No	No	No	No		No	No	
Pedestrian Recall	No	No		No	No	No	No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	R	L	C	C	L	C	R
C, Cycle Length [s]	120	120	120	120	120	120	120	120	120	120	120	120
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	26	29	29	16	19	32	9	51	51	9	51	51
g / C, Green / Cycle	0.21	0.24	0.24	0.13	0.16	0.27	0.08	0.42	0.42	0.08	0.42	0.42
(v / s)_i Volume / Saturation Flow Rate	0.19	0.21	0.19	0.12	0.06	0.22	0.07	0.23	0.21	0.07	0.38	0.16
s, saturation flow rate [veh/h]	3400	1900	1900	1800	3800	1900	3400	1900	1900	3400	3800	1900
c, Capacity [veh/h]	727	452	452	239	596	505	257	799	799	257	1597	799
d1, Uniform Delay [s]	45.68	44.22	42.89	51.17	45.51	41.59	55.03	26.20	25.70	54.86	32.32	23.99
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.20	0.11	0.50	0.50	0.11	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	3.63	6.15	3.08	10.53	0.43	6.61	10.79	2.69	2.33	8.18	8.13	1.36
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.88	0.89	0.79	0.89	0.40	0.84	0.90	0.55	0.51	0.86	0.89	0.38
d, Delay for Lane Group [s/veh]	49.31	50.37	45.98	61.70	45.94	48.20	65.83	28.88	28.03	63.04	40.46	25.35
Lane Group LOS	D	D	D	E	D	D	E	C	C	E	D	C
Critical Lane Group	Yes	No	No	No	No	Yes	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	9.55	12.26	10.25	6.96	3.22	12.65	3.85	9.91	9.06	3.59	20.59	6.20
50th-Percentile Queue Length [ft/ln]	238.66	306.55	256.33	173.90	80.61	316.27	96.22	247.73	226.46	89.87	514.76	155.00
95th-Percentile Queue Length [veh/ln]	14.61	18.00	15.50	11.28	5.80	18.48	6.93	15.07	13.99	6.47	28.03	10.28
95th-Percentile Queue Length [ft/ln]	365.33	450.12	387.62	282.04	145.10	462.09	173.19	376.79	349.86	161.77	700.81	257.09

Movement, Approach, & Intersection Results

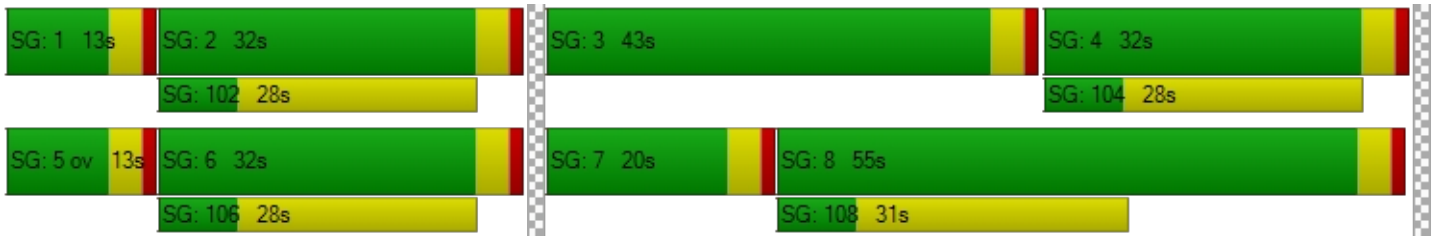
d_M, Delay for Movement [s/veh]	49.31	50.03	45.98	61.70	45.94	48.20	65.83	28.58	28.03	63.04	40.46	25.35
Movement LOS	D	D	D	E	D	D	E	C	C	E	D	C
d_A, Approach Delay [s/veh]	48.77			50.87			36.49			40.68		
Approach LOS	D			D			D			D		
d_I, Intersection Delay [s/veh]	43.64											
Intersection LOS	D											
Intersection V/C	0.948											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	49.52	49.52	49.52	49.52
l_p,int, Pedestrian LOS Score for Intersection	2.795	2.765	3.046	3.049
Crosswalk LOS	C	C	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	850	467	467	467
d_b, Bicycle Delay [s]	19.85	35.28	35.28	35.28
l_b,int, Bicycle LOS Score for Intersection	2.712	2.278	2.447	3.169
Bicycle LOS	B	B	B	C

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 6: Peyton Drive at Woodview Road

Control Type:	All-way stop	Delay (sec / veh):	13.4
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.510

Intersection Setup

Name	Peyton Drive			Peyton Drive			Woodview Road			Woodview Road		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	0	0	1	1	0	0	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			45.00			40.00			35.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			No			No		

Volumes

Name	Peyton Drive			Peyton Drive			Woodview Road			Woodview Road		
Base Volume Input [veh/h]	34	208	4	140	130	77	69	34	35	2	33	248
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	34	208	4	140	130	77	69	34	35	2	33	248
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	9	55	1	37	34	20	18	9	9	1	9	65
Total Analysis Volume [veh/h]	36	219	4	147	137	81	73	36	37	2	35	261
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	477	512	488	524	584	460	516	494	581
Degree of Utilization, x	0.08	0.44	0.30	0.26	0.14	0.16	0.14	0.00	0.51

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	0.24	2.18	1.26	1.04	0.48	0.56	0.49	0.01	2.88
95th-Percentile Queue Length [ft]	6.09	54.52	31.44	26.03	12.00	14.00	12.26	0.30	72.12
Approach Delay [s/veh]	14.45		12.02			11.42		15.13	
Approach LOS	B		B			B		C	
Intersection Delay [s/veh]	13.40								
Intersection LOS	B								

Intersection Level Of Service Report
Intersection 7: Pipeline Avenue at Woodview Road

Control Type:	Two-way stop	Delay (sec / veh):	127.1
Analysis Method:	HCM 7th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.780

Intersection Setup

Name	Pipeline Avenue		Pipeline Avenue		Woodview Road	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	40.00		30.00		35.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name	Pipeline Avenue		Pipeline Avenue		Woodview Road	
Base Volume Input [veh/h]	195	419	293	57	119	212
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	195	419	293	57	119	212
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	51	110	77	15	31	56
Total Analysis Volume [veh/h]	205	441	308	60	125	223
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.17	0.00	0.00	0.00	0.78	0.32
d_M, Delay for Movement [s/veh]	8.28	0.00	0.00	0.00	127.11	109.76
Movement LOS	A	A	A	A	F	F
95th-Percentile Queue Length [veh/ln]	0.38	0.38	0.00	0.00	13.50	13.50
95th-Percentile Queue Length [ft/ln]	9.62	9.62	0.00	0.00	337.48	337.48
d_A, Approach Delay [s/veh]	2.63		0.00		115.99	
Approach LOS	A		A		F	
d_I, Intersection Delay [s/veh]	30.88					
Intersection LOS	F					

Intersection Level Of Service Report
Intersection 8: Pipeline Avenue at Soquel Canyon Parkway

Control Type:	All-way stop	Delay (sec / veh):	35.5
Analysis Method:	HCM 7th Edition	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.015

Intersection Setup

Name	Pipeline Avenue		Soquel Canyon Parkway		Soquel Canyon Parkway	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	1	0	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	40.00		45.00		50.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		No	

Volumes

Name	Pipeline Avenue		Soquel Canyon Parkway		Soquel Canyon Parkway	
Base Volume Input [veh/h]	497	27	48	287	267	424
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	497	27	48	287	267	424
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	131	7	13	76	70	112
Total Analysis Volume [veh/h]	523	28	51	302	281	446
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	551	448	478	478	478	513	513	569
Degree of Utilization, x	1.02	0.11	0.21	0.21	0.21	0.27	0.27	0.78

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	14.90	0.38	0.79	0.79	0.79	1.10	1.10	7.36
95th-Percentile Queue Length [ft]	372.46	9.56	19.72	19.72	19.72	27.61	27.61	183.93
Approach Delay [s/veh]	68.20	12.18				22.06		
Approach LOS	F	B				C		
Intersection Delay [s/veh]	35.51							
Intersection LOS	E							

Intersection Level Of Service Report

Intersection 9: Soquel Canyon Parkway at Los Serranos Country Club Drive/Butterfield Ranch Road

Control Type:	Signalized	Delay (sec / veh):	33.9
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.577

Intersection Setup

Name	Soquel Canyon Parkway			Soquel Canyon Parkway			Lo Se			Butterfield Ranch Road		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	0	1	0	0	1	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Soquel Canyon Parkway			Soquel Canyon Parkway			Lo Se			Butterfield Ranch Road		
Base Volume Input [veh/h]	14	880	151	120	388	266	351	158	21	298	267	630
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	14	880	151	120	388	266	351	158	21	298	267	630
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	4	232	40	32	102	70	92	42	6	78	70	166
Total Analysis Volume [veh/h]	15	926	159	126	408	280	369	166	22	314	281	663
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Overlap
Signal Group	1	6	0	5	2	0	3	8	0	7	4	4
Auxiliary Signal Groups												4,5
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	6
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	30
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	3.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	1.0
Split [s]	17	39	0	10	32	0	32	39	0	32	39	39
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	3.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	7
Pedestrian Clearance [s]	0	28	0	0	18	0	0	28	0	0	28	28
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	2.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	2.0
Minimum Recall	No	No		No	No		No	No		No	No	No
Maximum Recall	No	No		No	No		No	No		No	No	No
Pedestrian Recall	No	No		No	No		No	No		No	No	No
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	C	L	C	C	L	C	R
C, Cycle Length [s]	120	120	120	120	120	120	120	120	120	120	120	120
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	0.00
g_i, Effective Green Time [s]	2	60	60	6	64	64	16	24	24	14	22	32
g / C, Green / Cycle	0.02	0.50	0.50	0.05	0.53	0.53	0.13	0.20	0.20	0.11	0.18	0.27
(v / s)_i Volume / Saturation Flow Rate	0.01	0.19	0.19	0.04	0.11	0.15	0.11	0.05	0.05	0.09	0.15	0.17
s, saturation flow rate [veh/h]	1800	3800	1900	3400	3800	1900	3400	1900	1900	3400	1900	3800
c, Capacity [veh/h]	37	1912	956	173	2026	1013	444	378	378	387	347	1013
d1, Uniform Delay [s]	58.07	18.34	18.24	56.17	14.65	15.34	50.91	40.55	40.48	51.94	47.09	39.13
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	6.93	0.58	1.11	5.82	0.22	0.68	4.11	0.35	0.33	4.12	4.56	0.72
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.40	0.38	0.37	0.73	0.20	0.28	0.83	0.25	0.24	0.81	0.81	0.65
d, Delay for Lane Group [s/veh]	65.00	18.92	19.36	61.99	14.88	16.02	55.02	40.90	40.81	56.06	51.66	39.85
Lane Group LOS	E	B	B	E	B	B	E	D	D	E	D	D
Critical Lane Group	No	Yes	No	Yes	No	No	Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	0.52	6.31	6.29	2.02	2.95	4.35	5.66	2.43	2.35	4.83	8.48	8.77
50th-Percentile Queue Length [ft/ln]	13.05	157.78	157.19	50.56	73.86	108.64	141.45	60.86	58.73	120.87	211.99	219.29
95th-Percentile Queue Length [veh/ln]	0.94	10.43	10.40	3.64	5.32	7.76	9.56	4.38	4.23	8.44	13.26	13.63
95th-Percentile Queue Length [ft/ln]	23.49	260.78	259.99	91.00	132.96	194.11	238.97	109.55	105.71	211.03	331.38	340.72

Movement, Approach, & Intersection Results

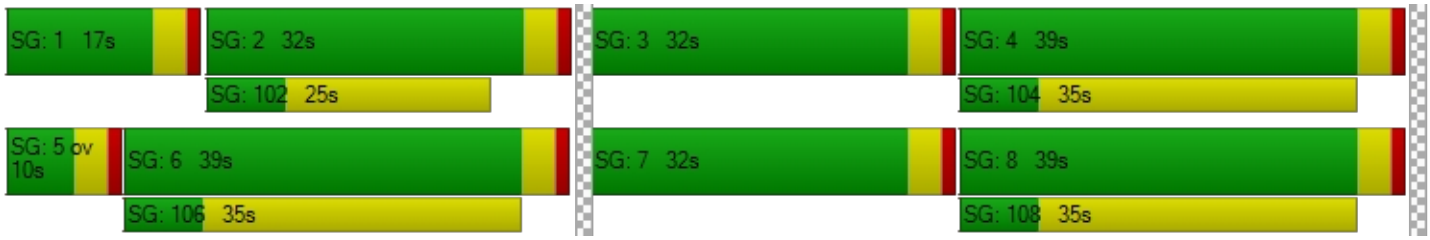
d_M, Delay for Movement [s/veh]	65.00	19.01	19.36	61.99	14.88	16.02	55.02	40.86	40.81	56.06	51.66	39.85
Movement LOS	E	B	B	E	B	B	E	D	D	E	D	D
d_A, Approach Delay [s/veh]	19.69			22.56			50.24			46.54		
Approach LOS	B			C			D			D		
d_I, Intersection Delay [s/veh]	33.94											
Intersection LOS	C											
Intersection V/C	0.577											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	49.52	49.52	49.52	49.52
l_p,int, Pedestrian LOS Score for Intersection	2.865	3.077	2.535	2.948
Crosswalk LOS	C	C	B	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	583	467	583	583
d_b, Bicycle Delay [s]	30.12	35.28	30.12	30.12
l_b,int, Bicycle LOS Score for Intersection	2.165	2.007	2.019	3.635
Bicycle LOS	B	B	B	D

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

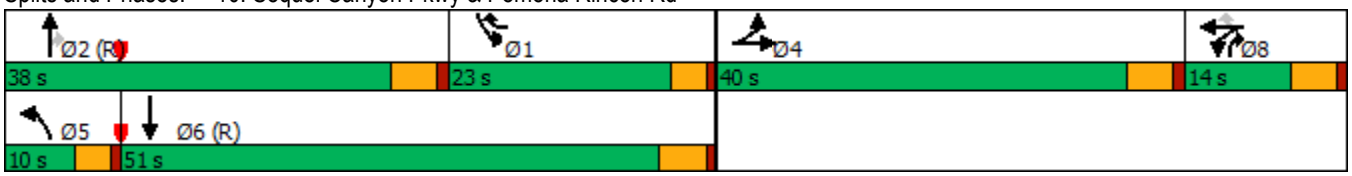


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	32	92	7	160	3	518	34	1438	400	677	620	62
Future Volume (vph)	32	92	7	160	3	518	34	1438	400	677	620	62
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	0.95	0.91	0.95	1.00	0.86	0.86	0.97	0.91	0.91
Frt		0.989			0.861	0.850		0.996	0.850		0.986	
Flt Protected	0.950			0.950	0.997		0.950			0.950		
Satd. Flow (prot)	1770	1842	0	1681	1455	1504	1770	4787	1362	3433	5014	0
Flt Permitted	0.950			0.950	0.997		0.950			0.950		
Satd. Flow (perm)	1770	1842	0	1681	1455	1504	1770	4787	1362	3433	5014	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3			383	414		3	393		17	
Link Speed (mph)		25			25			50			50	
Link Distance (ft)		560			625			594			526	
Travel Time (s)		15.3			17.0			8.1			7.2	
Peak Hour Factor	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65
Adj. Flow (vph)	49	142	11	246	5	797	52	2212	615	1042	954	95
Shared Lane Traffic (%)				10%		48%			10%			
Lane Group Flow (vph)	49	153	0	221	413	414	52	2274	553	1042	1049	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2	1	1	2	1	1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100		20	100	20	20	100	20	20	100	
Trailing Detector (ft)	0	0		0	0	0	0	0	0	0	0	
Detector 1 Position(ft)	0	0		0	0	0	0	0	0	0	0	
Detector 1 Size(ft)	20	6		20	6	20	20	6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Split	NA		Split	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	
Protected Phases	4	4		8	8	1	5	2	8	1	6	
Permitted Phases						8			2			
Detector Phase	4	4		8	8	1	5	2	8	1	6	
Switch Phase												
Minimum Initial (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Split (s)	40.0	40.0		11.0	11.0	10.0	10.0	30.0	11.0	10.0	23.0	
Total Split (s)	40.0	40.0		14.0	14.0	23.0	10.0	38.0	14.0	23.0	51.0	
Total Split (%)	34.8%	34.8%		12.2%	12.2%	20.0%	8.7%	33.0%	12.2%	20.0%	44.3%	
Maximum Green (s)	35.0	35.0		9.0	9.0	19.0	6.0	33.0	9.0	19.0	46.0	
Yellow Time (s)	4.0	4.0		4.0	4.0	3.0	3.0	4.0	4.0	3.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0	4.0	4.0	5.0	5.0	4.0	5.0	
Lead/Lag						Lag	Lead	Lead		Lag	Lag	
Lead-Lag Optimize?						Yes	Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	None		None	None	None	None	C-Max	None	None	C-Max	
Walk Time (s)	7.0	7.0						7.0			7.0	
Flash Dont Walk (s)	28.0	28.0						18.0			11.0	
Pedestrian Calls (#/hr)	5	5						5			5	
Act Effct Green (s)	17.7	17.7		26.3	26.3	46.3	6.0	33.0	64.3	19.0	48.0	
Actuated g/C Ratio	0.15	0.15		0.23	0.23	0.40	0.05	0.29	0.56	0.17	0.42	
v/c Ratio	0.18	0.54		0.58	0.66	0.49	0.57	1.65	0.59	1.84	0.50	
Control Delay	39.9	48.9		48.6	12.2	3.6	76.8	326.8	8.6	412.9	25.7	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	39.9	48.9		48.6	12.2	3.6	76.8	326.8	8.6	412.9	25.7	
LOS	D	D		D	B	A	E	F	A	F	C	
Approach Delay		46.8			16.5			261.1			218.6	
Approach LOS		D			B			F			F	
Queue Length 50th (ft)	33	107		148	18	0	38	~956	60	~603	208	
Queue Length 95th (ft)	39	97		#271	5	0	58	#646	58	#465	166	
Internal Link Dist (ft)		480			545			514			446	
Turn Bay Length (ft)												
Base Capacity (vph)	538	562		384	628	853	92	1375	935	567	2102	
Starvation Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.09	0.27		0.58	0.66	0.49	0.57	1.65	0.59	1.84	0.50	

Intersection Summary			
Area Type:	Other		
Cycle Length: 115			
Actuated Cycle Length: 115			
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green			
Natural Cycle: 115			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.84			
Intersection Signal Delay: 198.7		Intersection LOS: F	
Intersection Capacity Utilization 81.0%		ICU Level of Service D	
Analysis Period (min) 15			
~ Volume exceeds capacity, queue is theoretically infinite.			
Queue shown is maximum after two cycles.			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 10: Soquel Canyon Pkwy & Pomona Rincon Rd



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	32	92	7	160	3	518	34	1438	400	677	620	62
Future Volume (veh/h)	32	92	7	160	3	518	34	1438	400	677	620	62
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	49	142	11	166	0	886	52	2212	615	1042	954	95
Peak Hour Factor	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	190	183	14	139	0	1371	75	1610	579	1224	2869	285
Arrive On Green	0.11	0.11	0.11	0.08	0.00	0.08	0.04	0.29	0.29	0.35	0.61	0.61
Sat Flow, veh/h	1781	1714	133	1781	0	3170	1781	5611	1585	3456	4721	469
Grp Volume(v), veh/h	49	0	153	166	0	886	52	2212	615	1042	687	362
Grp Sat Flow(s),veh/h/ln	1781	0	1846	1781	0	1585	1781	1870	1585	1728	1702	1786
Q Serve(g_s), s	2.9	0.0	9.3	9.0	0.0	0.0	3.3	33.0	33.0	32.1	11.4	11.5
Cycle Q Clear(g_c), s	2.9	0.0	9.3	9.0	0.0	0.0	3.3	33.0	33.0	32.1	11.4	11.5
Prop In Lane	1.00		0.07	1.00		1.00	1.00		1.00	1.00		0.26
Lane Grp Cap(c), veh/h	190	0	197	139	0	1371	75	1610	579	1224	2069	1085
V/C Ratio(X)	0.26	0.00	0.78	1.19	0.00	0.65	0.69	1.37	1.06	0.85	0.33	0.33
Avail Cap(c_a), veh/h	542	0	562	139	0	1371	93	1610	579	1224	2069	1085
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	47.2	0.0	50.0	53.0	0.0	25.7	54.3	41.0	33.6	34.3	11.1	11.1
Incr Delay (d2), s/veh	0.7	0.0	6.5	136.5	0.0	1.1	14.9	172.2	55.1	5.9	0.4	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	0.0	4.7	9.3	0.0	9.7	1.7	40.0	25.1	13.6	3.9	4.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	47.9	0.0	56.5	189.5	0.0	26.8	69.2	213.2	88.7	40.2	11.5	11.9
LnGrp LOS	D	A	E	F	A	C	E	F	F	D	B	B
Approach Vol, veh/h		202			1052			2879			2091	
Approach Delay, s/veh		54.4			52.4			184.0			25.9	
Approach LOS		D			D			F			C	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	45.7	38.0		17.3	8.9	74.9		14.0				
Change Period (Y+Rc), s	5.0	* 5		5.0	4.0	5.0		5.0				
Max Green Setting (Gmax), s	19.0	* 33		35.0	6.0	46.0		9.0				
Max Q Clear Time (g_c+I1), s	34.1	35.0		11.3	5.3	13.5		11.0				
Green Ext Time (p_c), s	0.0	0.0		1.0	0.0	7.1		0.0				

Intersection Summary			
HCM 6th Ctrl Delay		104.5	
HCM 6th LOS		F	

Notes

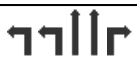
User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection Level Of Service Report
Intersection 11: Peyton Drive at Grand Avenue

Control Type:	Signalized	Delay (sec / veh):	38.3
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.745

Intersection Setup

Name	Peyton Drive			Peyton Drive			Grand Avenue			Grand Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	1	0	0	1	0	1	1	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Peyton Drive			Peyton Drive			Grand Avenue			Grand Avenue		
Base Volume Input [veh/h]	245	678	160	148	789	269	235	628	285	249	1070	109
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	245	678	160	148	789	269	235	628	285	249	1070	109
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	64	178	42	39	208	71	62	165	75	66	282	29
Total Analysis Volume [veh/h]	258	714	168	156	831	283	247	661	300	262	1126	115
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	1	6	0	5	2	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	15	39	0	11	35	0	14	47	0	23	56	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	28	0	0	24	0	0	31	0	0	28	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	C	L	C	R	L	C	R
C, Cycle Length [s]	120	120	120	120	120	120	120	120	120	120	120	120
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	11	47	47	7	43	43	10	38	38	12	40	40
g / C, Green / Cycle	0.09	0.39	0.39	0.06	0.36	0.36	0.08	0.32	0.32	0.10	0.33	0.33
(v / s)_i Volume / Saturation Flow Rate	0.08	0.13	0.09	0.05	0.20	0.18	0.07	0.17	0.16	0.08	0.30	0.06
s, saturation flow rate [veh/h]	3400	5700	1900	3400	3800	1900	3400	3800	1900	3400	3800	1900
c, Capacity [veh/h]	312	2235	745	201	1366	683	285	1212	606	328	1260	630
d1, Uniform Delay [s]	53.58	25.35	24.33	55.71	30.82	30.22	54.32	33.70	33.05	53.10	38.12	28.55
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	5.54	0.38	0.70	6.35	1.65	2.76	7.77	0.38	0.63	4.50	2.47	0.14
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.83	0.32	0.23	0.78	0.56	0.51	0.87	0.55	0.49	0.80	0.89	0.18
d, Delay for Lane Group [s/veh]	59.11	25.73	25.03	62.05	32.47	32.98	62.09	34.08	33.68	57.60	40.59	28.69
Lane Group LOS	E	C	C	E	C	C	E	C	C	E	D	C
Critical Lane Group	Yes	No	No	No	Yes	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	4.07	4.80	3.34	2.51	9.12	8.48	3.99	8.00	7.17	4.07	15.96	2.40
50th-Percentile Queue Length [ft/ln]	101.64	120.04	83.61	62.67	227.93	212.02	99.82	199.88	179.18	101.82	398.91	59.98
95th-Percentile Queue Length [veh/ln]	7.32	8.40	6.02	4.51	14.07	13.26	7.19	12.63	11.56	7.33	22.51	4.32
95th-Percentile Queue Length [ft/ln]	182.95	209.88	150.51	112.81	351.73	331.42	179.68	315.81	288.94	183.27	562.69	107.97

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	59.11	25.73	25.03	62.05	32.51	32.98	62.09	34.08	33.68	57.60	40.59	28.69
Movement LOS	E	C	C	E	C	C	E	C	C	E	D	C
d_A, Approach Delay [s/veh]	33.18			36.25			39.71			42.64		
Approach LOS	C			D			D			D		
d_I, Intersection Delay [s/veh]	38.26											
Intersection LOS	D											
Intersection V/C	0.745											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	49.52	49.52	49.52	49.52
l_p,int, Pedestrian LOS Score for Intersection	3.137	3.025	3.008	3.042
Crosswalk LOS	C	C	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	583	517	716	866
d_b, Bicycle Delay [s]	30.12	33.02	24.72	19.28
l_b,int, Bicycle LOS Score for Intersection	2.187	2.258	2.556	2.800
Bicycle LOS	B	B	B	C

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 12: Carbon Canyon Road at Fairway Drive/Ginseng Lane

Control Type:	Two-way stop	Delay (sec / veh):	2,336.1
Analysis Method:	HCM 7th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	4.237

Intersection Setup

Name	Carbon Canyon Road			Carbon Canyon Road			Fairway Drive			Ginseng Lane		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	0	0	0	1	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	45.00			45.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			No			No		

Volumes

Name	Carbon Canyon Road			Carbon Canyon Road			Fairway Drive			Ginseng Lane		
Base Volume Input [veh/h]	24	663	0	1	2065	27	33	0	28	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	24	663	0	1	2065	27	33	0	28	0	0	0
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	6	174	0	0	543	7	9	0	7	0	0	0
Total Analysis Volume [veh/h]	25	698	0	1	2174	28	35	0	29	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Free	Free	Stop	Stop
Flared Lane				No
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance			No	No
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.10	0.01	0.00	0.00	0.02	0.00	4.24	0.00	0.50	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	21.85	0.00	0.00	9.01	0.00	0.00	2336.06	2172.69	119.06	904.90	283.30	13.17
Movement LOS	C	A	A	A	A	A	F	F	F	F	F	B
95th-Percentile Queue Length [veh/ln]	0.35	0.00	0.00	0.00	0.00	0.00	5.66	5.66	1.96	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	8.67	0.00	0.00	0.08	0.00	0.00	141.52	141.52	49.10	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	0.76			0.00			1331.48			400.46		
Approach LOS	A			A			F			F		
d_I, Intersection Delay [s/veh]	28.69											
Intersection LOS	F											

Intersection Level Of Service Report
Intersection 13: Carbon Canyon Road at Canyon Hills Road

Control Type:	Two-way stop	Delay (sec / veh):	10,000.0
Analysis Method:	HCM 7th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	16.136

Intersection Setup

Name	Carbon Canyon Road			Carbon Canyon Road			Canyon Hills Road			Canyon Hills Road		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	1	0	0	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	45.00			45.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			No			No		

Volumes

Name	Carbon Canyon Road			Carbon Canyon Road			Canyon Hills Road			Canyon Hills Road		
Base Volume Input [veh/h]	17	576	5	6	2063	32	55	0	49	13	0	16
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	17	576	5	6	2063	32	55	0	49	13	0	16
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	4	152	1	2	543	8	14	0	13	3	0	4
Total Analysis Volume [veh/h]	18	606	5	6	2172	34	58	0	52	14	0	17
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Free	Free	Stop	Stop
Flared Lane			No	No
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance			No	No
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.08	0.01	0.00	0.01	0.02	0.00	6.43	0.00	0.90	16.14	0.00	0.03
d_M, Delay for Movement [s/veh]	21.38	0.00	0.00	8.74	0.00	0.00	3508.92	3352.30	3172.51	10000.0	8697.35	8456.85
Movement LOS	C	A	A	A	A	A	F	F	F	F	F	F
95th-Percentile Queue Length [veh/ln]	0.24	0.00	0.00	0.02	0.00	0.00	14.68	14.68	14.68	5.68	5.68	5.68
95th-Percentile Queue Length [ft/ln]	6.09	0.00	0.00	0.47	0.00	0.00	367.10	367.10	367.10	142.04	142.04	142.04
d_A, Approach Delay [s/veh]	0.61			0.02			3349.89			9153.76		
Approach LOS	A			A			F			F		
d_I, Intersection Delay [s/veh]	218.88											
Intersection LOS	F											

Intersection Level Of Service Report
Intersection 1: Peyton Drive at Chino Avenue

Control Type:	Signalized	Delay (sec / veh):	34.3
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.658

Intersection Setup

Name	Peyton Drive			Peyton Drive			Chino Avenue			Chino Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	0	1	0	0	1	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Peyton Drive			Peyton Drive			Chino Avenue			Chino Avenue		
Base Volume Input [veh/h]	140	772	244	414	994	176	111	335	171	156	168	327
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	140	772	244	414	994	176	111	335	171	156	168	327
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	37	203	64	109	262	46	29	88	45	41	44	86
Total Analysis Volume [veh/h]	147	813	257	436	1046	185	117	353	180	164	177	344
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	115
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	1	6	0	5	2	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	11	35	0	22	46	0	13	39	0	19	45	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	24	0	0	24	0	0	28	0	0	28	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	C	L	C	C	L	C	R
C, Cycle Length [s]	115	115	115	115	115	115	115	115	115	115	115	115
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	7	50	50	17	60	60	9	20	20	12	24	24
g / C, Green / Cycle	0.06	0.43	0.43	0.15	0.52	0.52	0.08	0.18	0.18	0.11	0.20	0.20
(v / s)_i Volume / Saturation Flow Rate	0.04	0.19	0.18	0.13	0.22	0.21	0.07	0.09	0.09	0.09	0.05	0.18
s, saturation flow rate [veh/h]	3400	3800	1900	3400	3800	1900	1800	3800	1900	1800	3800	1900
c, Capacity [veh/h]	204	1640	820	496	1965	983	142	669	334	194	778	389
d1, Uniform Delay [s]	53.13	23.02	22.64	48.16	17.15	17.02	52.21	43.07	43.16	50.41	38.17	44.43
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	4.70	0.88	1.54	5.23	0.67	1.27	11.20	0.65	1.35	9.69	0.15	6.76
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.72	0.45	0.41	0.88	0.42	0.41	0.82	0.53	0.54	0.85	0.23	0.88
d, Delay for Lane Group [s/veh]	57.82	23.90	24.18	53.40	17.82	18.29	63.42	43.72	44.50	60.10	38.31	51.19
Lane Group LOS	E	C	C	D	B	B	E	D	D	E	D	D
Critical Lane Group	No	Yes	No	Yes	No	No	Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	2.22	7.10	6.66	6.47	6.81	6.75	3.77	4.62	4.79	5.15	2.11	10.20
50th-Percentile Queue Length [ft/ln]	55.50	177.49	166.50	161.68	170.22	168.68	94.14	115.60	119.72	128.70	52.69	254.90
95th-Percentile Queue Length [veh/ln]	4.00	11.47	10.89	10.64	11.09	11.01	6.78	8.15	8.38	8.87	3.79	15.43
95th-Percentile Queue Length [ft/ln]	99.90	286.73	272.31	265.94	277.20	275.18	169.46	203.76	209.44	221.73	94.84	385.82

Movement, Approach, & Intersection Results

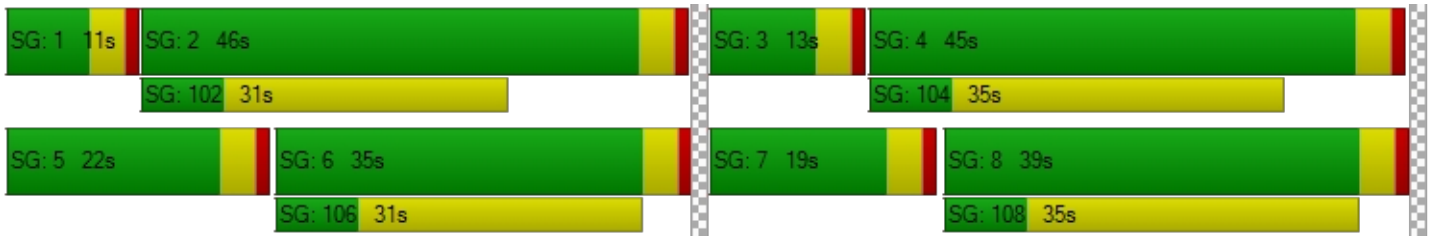
d_M, Delay for Movement [s/veh]	57.82	23.93	24.18	53.40	17.92	18.29	63.42	43.72	44.50	60.10	38.31	51.19
Movement LOS	E	C	C	D	B	B	E	D	D	E	D	D
d_A, Approach Delay [s/veh]	28.08			27.24			47.48			50.00		
Approach LOS	C			C			D			D		
d_I, Intersection Delay [s/veh]	34.29											
Intersection LOS	C											
Intersection V/C	0.658											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	47.05	47.05	47.05	47.05
l_p,int, Pedestrian LOS Score for Intersection	3.055	3.096	2.767	2.847
Crosswalk LOS	C	C	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	539	730	608	713
d_b, Bicycle Delay [s]	30.70	23.19	27.84	23.83
l_b,int, Bicycle LOS Score for Intersection	2.229	2.476	1.917	2.125
Bicycle LOS	B	B	A	B

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 2: Gateway Village/Boys Republic Drive at Grand Avenue

Control Type:	Signalized	Delay (sec / veh):	225.1
Analysis Method:	HCM 7th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.541

Intersection Setup

Name	Boys Republic Drive			Gateway Village			Grand Avenue			Grand Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	1	1	0	0	1	0	0	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			No		

Volumes

Name	Boys Republic Drive			Gateway Village			Grand Avenue			Grand Avenue		
Base Volume Input [veh/h]	37	36	745	290	57	77	121	1471	62	870	1358	140
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	37	36	745	290	57	77	121	1471	62	870	1358	140
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	10	9	196	76	15	20	32	387	16	229	357	37
Total Analysis Volume [veh/h]	39	38	784	305	60	81	127	1548	65	916	1429	147
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Split	Split	Split	Split	Split	Split	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	0	8	0	0	4	0	5	2	0	1	6	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	0	6	0	0	6	0	6	6	0	6	6	0
Maximum Green [s]	0	30	0	0	30	0	30	30	0	30	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	20	0	0	35	0	13	25	0	40	52	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	0	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	24	0	0	14	0	0	11	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall		No			No		No	No		No	No	
Maximum Recall		No			No		No	No		No	No	
Pedestrian Recall		No			No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	R	L	C	L	C	C	L	C	C
C, Cycle Length [s]	120	120	120	120	120	120	120	120	120	120
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	29	29	18	18	9	21	21	36	48	48
g / C, Green / Cycle	0.24	0.24	0.15	0.15	0.08	0.18	0.18	0.30	0.40	0.40
(v / s)_i Volume / Saturation Flow Rate	0.04	0.41	0.13	0.12	0.07	0.28	0.29	0.51	0.27	0.28
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1800	3800	1900	1800	3800	1900
c, Capacity [veh/h]	438	462	265	265	135	669	335	540	1523	762
d1, Uniform Delay [s]	35.90	45.41	49.90	49.68	55.22	49.44	49.44	42.01	29.67	29.96
k, delay calibration	0.11	0.50	0.11	0.11	0.11	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.19	322.61	7.65	6.50	23.69	272.87	300.25	321.50	2.51	5.34
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.18	1.70	0.85	0.83	0.94	1.59	1.64	1.70	0.68	0.70
d, Delay for Lane Group [s/veh]	36.09	368.02	57.55	56.18	78.91	322.30	349.69	363.51	32.18	35.30
Lane Group LOS	D	F	E	E	E	F	F	F	C	D
Critical Lane Group	No	Yes	Yes	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	1.82	55.05	7.18	6.87	4.71	35.36	37.91	63.98	12.80	13.84
50th-Percentile Queue Length [ft/ln]	45.47	1376.22	179.47	171.64	117.73	884.03	947.69	1599.49	320.08	345.93
95th-Percentile Queue Length [veh/ln]	3.27	84.76	11.57	11.16	8.27	54.44	58.40	98.94	18.67	19.94
95th-Percentile Queue Length [ft/ln]	81.85	2119.05	289.32	279.07	206.70	1361.04	1460.08	2473.51	466.79	498.44

Movement, Approach, & Intersection Results

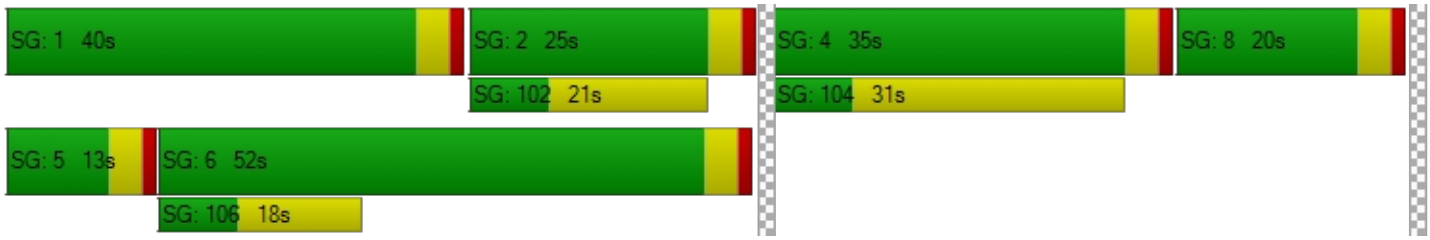
d_M, Delay for Movement [s/veh]	36.09	36.09	368.02	57.19	56.18	56.18	78.91	330.85	349.69	363.51	33.03	35.30
Movement LOS	D	D	F	E	E	E	E	F	F	F	C	D
d_A, Approach Delay [s/veh]	338.34			56.87			313.17			154.64		
Approach LOS	F			E			F			F		
d_I, Intersection Delay [s/veh]	225.12											
Intersection LOS	F											
Intersection V/C	1.541											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	0.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	49.51	49.51	49.51	0.00
l_p,int, Pedestrian LOS Score for Intersection	2.608	2.200	3.066	0.000
Crosswalk LOS	B	B	C	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	267	517	350	800
d_b, Bicycle Delay [s]	45.07	33.01	40.84	21.60
l_b,int, Bicycle LOS Score for Intersection	2.980	2.296	2.517	2.930
Bicycle LOS	C	B	B	C

Sequence

Ring 1	1	2	4	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 3: Peyton Drive at Eucalyptus Avenue

Control Type:	Signalized	Delay (sec / veh):	22.9
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.618

Intersection Setup

Name	Peyton Drive			Peyton Drive			Eucalyptus Avenue			Eucalyptus Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	1	1	0	0	1	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Peyton Drive			Peyton Drive			Eucalyptus Avenue			Eucalyptus Avenue		
Base Volume Input [veh/h]	45	562	206	239	725	348	248	401	32	203	332	231
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	45	562	206	239	725	348	248	401	32	203	332	231
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	12	148	54	63	191	92	65	106	8	53	87	61
Total Analysis Volume [veh/h]	47	592	217	252	763	366	261	422	34	214	349	243
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal Group	1	6	0	5	2	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	6	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	10	29	0	10	29	0	16	41	0	10	35	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	18	0	0	14	0	0	21	0	0	24	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		Yes	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	R	L	C	C	L	C	R
C, Cycle Length [s]	90	90	90	90	90	90	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	2.00	0.00	2.00	2.00	0.00	0.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	48	38	38	48	39	39	35	35	24	35	24	24
g / C, Green / Cycle	0.53	0.42	0.42	0.53	0.44	0.44	0.38	0.38	0.27	0.38	0.27	0.27
(v / s)_i Volume / Saturation Flow Rate	0.03	0.15	0.14	0.14	0.20	0.19	0.07	0.07	0.24	0.12	0.18	0.13
s, saturation flow rate [veh/h]	1800	3800	1900	1800	3800	1900	1800	1800	1900	1800	1900	1900
c, Capacity [veh/h]	799	1578	789	880	1655	827	522	690	517	270	506	506
d1, Uniform Delay [s]	10.35	18.03	17.83	11.71	17.98	17.80	18.45	18.45	31.44	19.42	29.72	27.82
k, delay calibration	0.11	0.50	0.50	0.50	0.50	0.50	0.11	0.11	0.15	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.03	0.61	1.10	0.82	0.93	1.71	0.25	0.13	7.05	5.22	1.68	0.71
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.06	0.35	0.33	0.29	0.46	0.44	0.25	0.19	0.88	0.79	0.69	0.48
d, Delay for Lane Group [s/veh]	10.38	18.64	18.93	12.53	18.90	19.51	18.70	18.58	38.49	24.64	31.40	28.52
Lane Group LOS	B	B	B	B	B	B	B	B	D	C	C	C
Critical Lane Group	No	Yes	No	Yes	No	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	0.44	3.91	3.74	2.81	5.56	5.47	1.80	1.79	10.22	3.44	6.86	4.42
50th-Percentile Queue Length [ft/ln]	10.94	97.76	93.38	70.37	139.05	136.84	45.06	44.79	255.50	86.02	171.54	110.43
95th-Percentile Queue Length [veh/ln]	0.79	7.04	6.72	5.07	9.43	9.31	3.24	3.23	15.46	6.19	11.16	7.86
95th-Percentile Queue Length [ft/ln]	19.68	175.97	168.08	126.67	235.74	232.76	81.11	80.63	386.58	154.84	278.94	196.60

Movement, Approach, & Intersection Results

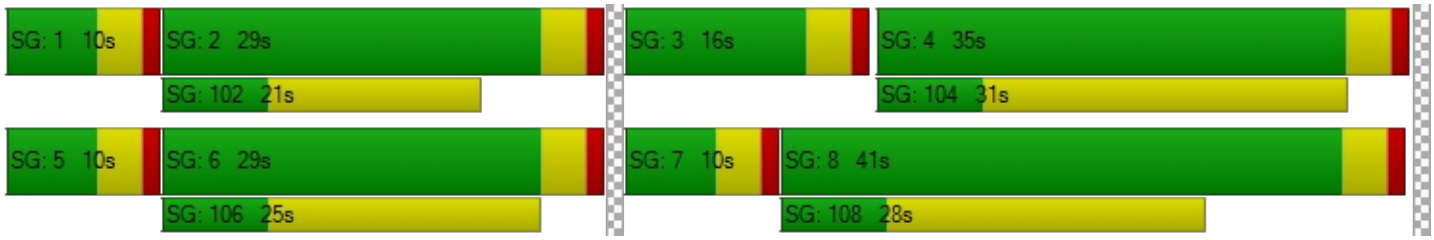
d_M, Delay for Movement [s/veh]	10.38	18.66	18.93	12.53	18.90	19.51	18.69	38.49	38.49	24.64	31.40	28.52
Movement LOS	B	B	B	B	B	B	B	D	D	C	C	C
d_A, Approach Delay [s/veh]	18.27			17.90			31.26			28.74		
Approach LOS	B			B			C			C		
d_I, Intersection Delay [s/veh]	22.86											
Intersection LOS	C											
Intersection V/C	0.618											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	34.72	34.72	34.72	34.72
l_p,int, Pedestrian LOS Score for Intersection	3.060	3.178	2.522	2.788
Crosswalk LOS	C	C	B	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	555	555	821	688
d_b, Bicycle Delay [s]	23.51	23.51	15.64	19.38
l_b,int, Bicycle LOS Score for Intersection	2.030	2.699	2.151	2.890
Bicycle LOS	B	B	B	C

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 4: Rustic Drive/Carbon Canyon Road at Chino Hills Parkway

Control Type:	Signalized	Delay (sec / veh):	119.2
Analysis Method:	HCM 7th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.228

Intersection Setup

Name	Carbon Canyon Road			Rustic Drive			Chino Hills Parkway			Chino Hills Parkway		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	1	0	0	1	0	1	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			No		

Volumes

Name	Carbon Canyon Road			Rustic Drive			Chino Hills Parkway			Chino Hills Parkway		
Base Volume Input [veh/h]	288	1	2071	24	1	1	12	869	215	938	820	35
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	288	1	2071	24	1	1	12	869	215	938	820	35
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	76	0	545	6	0	0	3	229	57	247	216	9
Total Analysis Volume [veh/h]	303	1	2180	25	1	1	13	915	226	987	863	37
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	0	8	0	0	4	0	5	2	0	1	6	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	0	6	0	0	6	0	6	6	0	6	6	0
Maximum Green [s]	0	30	0	0	30	0	30	30	0	30	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	59	0	0	59	0	10	29	0	32	51	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	0	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	21	0	0	18	0	0	11	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall		No			No		No	No		No	No	
Maximum Recall		No			No		No	No		No	No	
Pedestrian Recall		No			No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	L	C	R	L	C	C
C, Cycle Length [s]	120	120	120	120	120	120	120	120	120	120	120
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	55	55	55	55	55	2	25	25	28	51	51
g / C, Green / Cycle	0.46	0.46	0.46	0.46	0.46	0.02	0.21	0.21	0.23	0.42	0.42
(v / s)_i Volume / Saturation Flow Rate	0.17	0.57	0.57	0.01	0.00	0.01	0.24	0.12	0.29	0.24	0.24
s, saturation flow rate [veh/h]	1800	1900	1900	1800	1900	1800	3800	1900	3400	1900	1900
c, Capacity [veh/h]	845	869	869	61	869	33	795	397	794	806	806
d1, Uniform Delay [s]	21.24	32.55	32.55	17.92	17.69	58.19	47.42	42.56	45.96	26.05	26.04
k, delay calibration	0.11	0.50	0.50	0.11	0.11	0.11	0.50	0.50	0.14	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.26	124.30	124.30	4.42	0.00	7.34	82.24	5.80	112.58	2.79	2.78
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.36	1.26	1.26	0.41	0.00	0.39	1.15	0.57	1.24	0.56	0.56
d, Delay for Lane Group [s/veh]	21.50	156.85	156.85	22.33	17.69	65.54	129.66	48.36	158.54	28.84	28.81
Lane Group LOS	C	F	F	C	B	E	F	D	F	C	C
Critical Lane Group	No	Yes	No	No	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	5.59	54.30	54.30	0.46	0.03	0.46	20.88	6.66	24.15	10.25	10.22
50th-Percentile Queue Length [ft/ln]	139.81	1357.46	1357.46	11.49	0.77	11.46	522.05	166.59	603.82	256.22	255.62
95th-Percentile Queue Length [veh/ln]	9.47	77.72	77.72	0.83	0.06	0.83	30.57	10.90	36.10	15.50	15.47
95th-Percentile Queue Length [ft/ln]	236.77	1942.96	1942.96	20.67	1.38	20.63	764.26	272.42	902.49	387.47	386.73

Movement, Approach, & Intersection Results

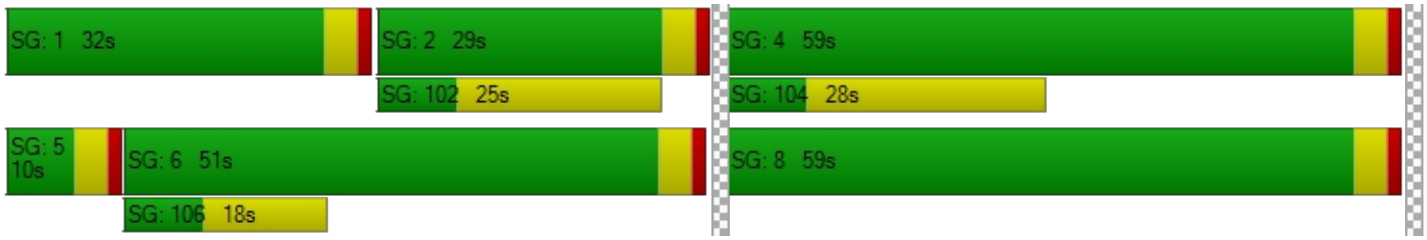
d_M, Delay for Movement [s/veh]	21.50	156.85	156.85	22.33	17.69	17.69	65.54	129.66	48.36	158.54	28.83	28.81
Movement LOS	C	F	F	C	B	B	E	F	D	F	C	C
d_A, Approach Delay [s/veh]	140.34			21.99			113.02			96.67		
Approach LOS	F			C			F			F		
d_I, Intersection Delay [s/veh]	119.24											
Intersection LOS	F											
Intersection V/C	1.228											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	0.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	49.49	49.49	49.49	0.00
l_p,int, Pedestrian LOS Score for Intersection	3.035	1.979	3.275	0.000
Crosswalk LOS	C	A	C	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	917	917	417	784
d_b, Bicycle Delay [s]	17.59	17.59	37.59	22.19
l_b,int, Bicycle LOS Score for Intersection	5.658	1.604	2.512	3.116
Bicycle LOS	F	A	B	C

Sequence

Ring 1	1	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 5: Peyton Drive at Chino Hills Parkway

Control Type:	Signalized	Delay (sec / veh):	108.2
Analysis Method:	HCM 7th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.216

Intersection Setup

Name	Peyton Drive			Peyton Drive			Chino Hills Parkway			Chino Hills Parkway		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	1	1	0	0	1	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Peyton Drive			Peyton Drive			Chino Hills Parkway			Chino Hills Parkway		
Base Volume Input [veh/h]	238	300	213	402	448	219	403	1524	552	274	1152	353
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	238	300	213	402	448	219	403	1524	552	274	1152	353
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	63	79	56	106	118	58	106	401	145	72	303	93
Total Analysis Volume [veh/h]	251	316	224	423	472	231	424	1604	581	288	1213	372
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	115
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Overlap	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	3	8	0	7	4	4	5	2	0	1	6	0
Auxiliary Signal Groups						4,5						
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	6	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	30	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	1.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	28	35	0	25	32	32	19	43	0	12	36	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	7	0	7	0	0	7	0
Pedestrian Clearance [s]	0	24	0	0	21	21	0	21	0	0	21	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No	No	No	No		No	No	
Maximum Recall	No	No		No	No	No	No	No		No	No	
Pedestrian Recall	No	No		No	No	No	No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	R	L	C	C	L	C	R
C, Cycle Length [s]	115	115	115	115	115	115	115	115	115	115	115	115
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	11	20	20	21	30	49	15	50	50	8	43	43
g / C, Green / Cycle	0.10	0.18	0.18	0.18	0.26	0.43	0.13	0.43	0.43	0.07	0.37	0.37
(v / s)_i Volume / Saturation Flow Rate	0.07	0.15	0.13	0.24	0.12	0.12	0.12	0.58	0.58	0.08	0.32	0.20
s, saturation flow rate [veh/h]	3400	1900	1900	1800	3800	1900	3400	1900	1900	3400	3800	1900
c, Capacity [veh/h]	325	335	335	329	1001	816	446	819	819	241	1409	704
d1, Uniform Delay [s]	50.84	46.11	45.04	47.05	35.68	21.35	49.65	32.76	32.76	53.50	33.49	28.35
k, delay calibration	0.11	0.13	0.11	0.38	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	3.89	8.10	3.39	144.57	0.35	0.19	11.09	158.54	158.54	96.18	7.10	2.82
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.77	0.86	0.75	1.28	0.47	0.28	0.95	1.33	1.33	1.19	0.86	0.53
d, Delay for Lane Group [s/veh]	54.73	54.21	48.43	191.61	36.03	21.54	60.74	191.30	191.30	149.68	40.59	31.17
Lane Group LOS	D	D	D	F	D	C	E	F	F	F	D	C
Critical Lane Group	No	Yes	No	Yes	No	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	3.70	8.75	7.10	22.59	5.62	4.08	6.72	58.05	58.05	6.71	16.72	8.51
50th-Percentile Queue Length [ft/ln]	92.62	218.85	177.48	564.80	140.41	102.11	167.96	1451.24	1451.24	167.69	417.88	212.73
95th-Percentile Queue Length [veh/ln]	6.67	13.61	11.47	34.17	9.50	7.35	10.97	85.03	85.03	11.56	23.42	13.29
95th-Percentile Queue Length [ft/ln]	166.71	340.16	286.72	854.17	237.58	183.80	274.24	2125.74	2125.74	289.03	585.50	332.33

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	54.73	53.72	48.43	191.61	36.03	21.54	60.74	191.30	191.30	149.68	40.59	31.17
Movement LOS	D	D	D	F	D	C	E	F	F	F	D	C
d_A, Approach Delay [s/veh]	52.54			91.50			170.08			55.49		
Approach LOS	D			F			F			E		
d_I, Intersection Delay [s/veh]	108.18											
Intersection LOS	F											
Intersection V/C	1.216											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	47.07	47.07	47.07	47.07
l_p,int, Pedestrian LOS Score for Intersection	2.811	2.828	3.164	3.180
Crosswalk LOS	C	C	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	539	487	678	556
d_b, Bicycle Delay [s]	30.72	32.95	25.15	29.99
l_b,int, Bicycle LOS Score for Intersection	2.212	2.489	3.712	3.105
Bicycle LOS	B	B	D	C

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 6: Peyton Drive at Woodview Road

Control Type:	All-way stop	Delay (sec / veh):	10.9
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.345

Intersection Setup

Name	Peyton Drive			Peyton Drive			Woodview Road			Woodview Road		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	0	0	1	1	0	0	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			45.00			40.00			35.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			No			No		

Volumes

Name	Peyton Drive			Peyton Drive			Woodview Road			Woodview Road		
Base Volume Input [veh/h]	45	93	3	181	153	74	59	44	45	5	44	111
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	45	93	3	181	153	74	59	44	45	5	44	111
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	12	24	1	48	40	19	16	12	12	1	12	29
Total Analysis Volume [veh/h]	47	98	3	191	161	78	62	46	47	5	46	117
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	512	553	554	599	679	511	580	518	603
Degree of Utilization, x	0.09	0.18	0.35	0.27	0.11	0.12	0.16	0.01	0.27

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	0.30	0.66	1.53	1.08	0.39	0.41	0.57	0.03	1.09
95th-Percentile Queue Length [ft]	7.54	16.57	38.23	27.00	9.68	10.29	14.19	0.73	27.27
Approach Delay [s/veh]	10.59		11.25			10.34		10.84	
Approach LOS	B		B			B		B	
Intersection Delay [s/veh]	10.91								
Intersection LOS	B								

Intersection Level Of Service Report
Intersection 7: Pipeline Avenue at Woodview Road

Control Type:	Two-way stop	Delay (sec / veh):	62.5
Analysis Method:	HCM 7th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.527

Intersection Setup

Name	Pipeline Avenue		Pipeline Avenue		Woodview Road	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	40.00		30.00		35.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name	Pipeline Avenue		Pipeline Avenue		Woodview Road	
Base Volume Input [veh/h]	147	330	426	121	86	158
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	147	330	426	121	86	158
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	39	87	112	32	23	42
Total Analysis Volume [veh/h]	155	347	448	127	91	166
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.16	0.00	0.00	0.00	0.53	0.30
d_M, Delay for Movement [s/veh]	8.79	0.00	0.00	0.00	62.51	48.04
Movement LOS	A	A	A	A	F	E
95th-Percentile Queue Length [veh/ln]	0.28	0.28	0.00	0.00	6.95	6.95
95th-Percentile Queue Length [ft/ln]	7.06	7.06	0.00	0.00	173.69	173.69
d_A, Approach Delay [s/veh]	2.72		0.00		53.17	
Approach LOS	A		A		F	
d_I, Intersection Delay [s/veh]	11.26					
Intersection LOS	F					

Intersection Level Of Service Report
Intersection 8: Pipeline Avenue at Soquel Canyon Parkway

Control Type:	All-way stop	Delay (sec / veh):	31.5
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.926

Intersection Setup

Name	Pipeline Avenue		Soquel Canyon Parkway		Soquel Canyon Parkway	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	1	0	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	40.00		45.00		50.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		No	

Volumes

Name	Pipeline Avenue		Soquel Canyon Parkway		Soquel Canyon Parkway	
Base Volume Input [veh/h]	431	43	28	251	240	446
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	431	43	28	251	240	446
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	113	11	7	66	63	117
Total Analysis Volume [veh/h]	454	45	29	264	253	469
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	538	435	464	464	464	495	495	551
Degree of Utilization, x	0.93	0.07	0.19	0.19	0.19	0.26	0.26	0.85

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	11.41	0.21	0.69	0.69	0.69	1.01	1.01	9.08
95th-Percentile Queue Length [ft]	285.26	5.34	17.29	17.29	17.29	25.23	25.23	226.97
Approach Delay [s/veh]	48.34	12.19				27.66		
Approach LOS	E	B				D		
Intersection Delay [s/veh]	31.49							
Intersection LOS	D							

Intersection Level Of Service Report

Intersection 9: Soquel Canyon Parkway at Los Serranos Country Club Drive/Butterfield Ranch Road

Control Type:	Signalized	Delay (sec / veh):	34.7
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.560

Intersection Setup

Name	Soquel Canyon Parkway			Soquel Canyon Parkway			Lo Se			Butterfield Ranch Road		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	0	1	0	0	1	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Soquel Canyon Parkway			Soquel Canyon Parkway			Lo Se			Butterfield Ranch Road		
Base Volume Input [veh/h]	40	536	164	385	887	263	427	285	43	232	185	326
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	40	536	164	385	887	263	427	285	43	232	185	326
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	11	141	43	101	233	69	112	75	11	61	49	86
Total Analysis Volume [veh/h]	42	564	173	405	934	277	449	300	45	244	195	343
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Overlap
Signal Group	1	6	0	5	2	0	3	8	0	7	4	4
Auxiliary Signal Groups												4,5
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	6
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	30
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	3.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	1.0
Split [s]	26	39	0	20	33	0	22	39	0	22	39	39
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	3.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	7
Pedestrian Clearance [s]	0	28	0	0	18	0	0	28	0	0	28	28
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	2.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	2.0
Minimum Recall	No	No		No	No		No	No		No	No	No
Maximum Recall	No	No		No	No		No	No		No	No	No
Pedestrian Recall	No	No		No	No		No	No		No	No	No
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	C	L	C	C	L	C	R
C, Cycle Length [s]	120	120	120	120	120	120	120	120	120	120	120	120
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	0.00
g_i, Effective Green Time [s]	5	55	55	16	66	66	18	22	22	11	15	35
g / C, Green / Cycle	0.04	0.46	0.46	0.13	0.55	0.55	0.15	0.18	0.18	0.09	0.13	0.29
(v / s)_i Volume / Saturation Flow Rate	0.02	0.13	0.13	0.12	0.22	0.20	0.13	0.09	0.09	0.07	0.10	0.09
s, saturation flow rate [veh/h]	1800	3800	1900	3400	3800	1900	3400	1900	1900	3400	1900	3800
c, Capacity [veh/h]	69	1739	870	455	2101	1051	501	350	350	309	243	1120
d1, Uniform Delay [s]	56.82	20.32	20.18	51.14	15.33	15.05	50.27	44.02	43.82	53.46	50.89	32.81
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	8.22	0.42	0.78	6.20	0.55	0.99	5.90	1.12	1.03	4.52	6.11	0.15
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.61	0.29	0.27	0.89	0.39	0.37	0.90	0.50	0.48	0.79	0.80	0.31
d, Delay for Lane Group [s/veh]	65.04	20.73	20.96	57.34	15.88	16.04	56.17	45.13	44.85	57.98	57.01	32.97
Lane Group LOS	E	C	C	E	B	B	E	D	D	E	E	C
Critical Lane Group	No	Yes	No	Yes	No	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	1.41	4.46	4.32	6.37	6.49	6.09	7.02	4.83	4.60	3.80	6.11	3.91
50th-Percentile Queue Length [ft/ln]	35.34	111.46	108.00	159.24	162.21	152.17	175.48	120.87	115.00	95.01	152.66	97.87
95th-Percentile Queue Length [veh/ln]	2.54	7.92	7.73	10.51	10.67	10.13	11.36	8.44	8.12	6.84	10.16	7.05
95th-Percentile Queue Length [ft/ln]	63.61	198.03	193.21	262.72	266.65	253.33	284.10	211.02	202.94	171.01	253.98	176.17

Movement, Approach, & Intersection Results

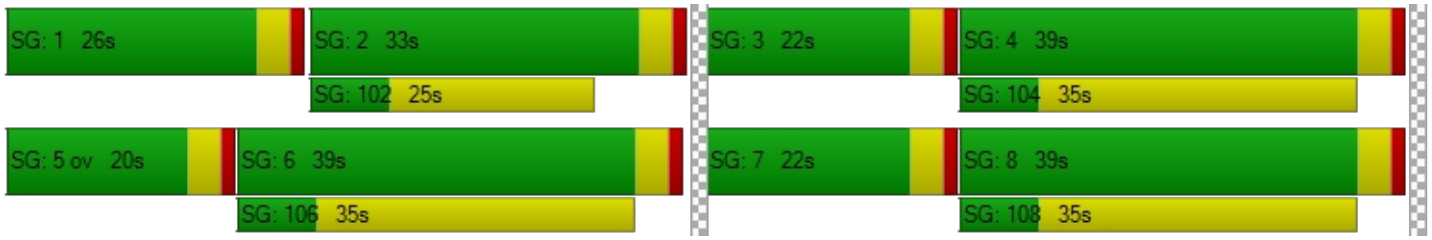
d_M, Delay for Movement [s/veh]	65.04	20.76	20.96	57.34	15.90	16.04	56.17	45.02	44.85	57.98	57.01	32.97
Movement LOS	E	C	C	E	B	B	E	D	D	E	E	C
d_A, Approach Delay [s/veh]	23.19			26.31			51.31			46.77		
Approach LOS	C			C			D			D		
d_I, Intersection Delay [s/veh]	34.73											
Intersection LOS	C											
Intersection V/C	0.560											

Other Modes

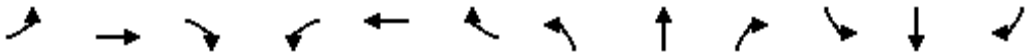
g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	49.52	49.52	49.52	49.52
l_p,int, Pedestrian LOS Score for Intersection	2.887	3.101	2.569	2.942
Crosswalk LOS	C	C	B	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	583	483	583	583
d_b, Bicycle Delay [s]	30.12	34.52	30.12	30.12
l_b,int, Bicycle LOS Score for Intersection	1.988	2.448	2.215	2.850
Bicycle LOS	A	B	B	C

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



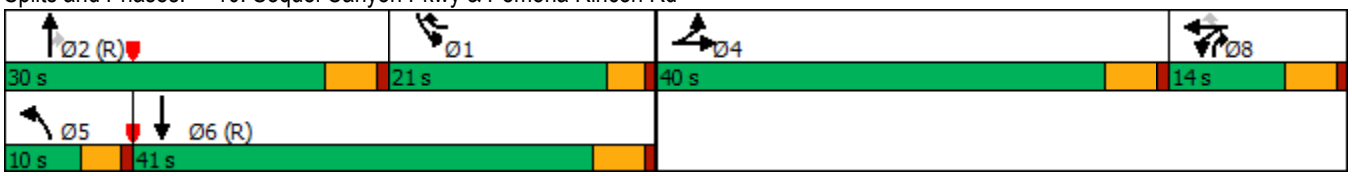
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	72	32	12	176	4	490	34	1000	293	750	1326	72
Future Volume (vph)	72	32	12	176	4	490	34	1000	293	750	1326	72
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	0.95	0.91	0.95	1.00	0.86	0.86	0.97	0.91	0.91
Frt		0.960			0.863	0.850		0.996	0.850		0.992	
Flt Protected	0.950			0.950	0.997		0.950			0.950		
Satd. Flow (prot)	1770	1788	0	1681	1458	1504	1770	4787	1362	3433	5045	0
Flt Permitted	0.950			0.950	0.997		0.950			0.950		
Satd. Flow (perm)	1770	1788	0	1681	1458	1504	1770	4787	1362	3433	5045	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		13			261	283		4	293		9	
Link Speed (mph)		25			25			50			50	
Link Distance (ft)		560			625			594			526	
Travel Time (s)		15.3			17.0			8.1			7.2	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	80	36	13	196	4	544	38	1111	326	833	1473	80
Shared Lane Traffic (%)				10%		48%			10%			
Lane Group Flow (vph)	80	49	0	176	285	283	38	1144	293	833	1553	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2	1	1	2	1	1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100		20	100	20	20	100	20	20	100	
Trailing Detector (ft)	0	0		0	0	0	0	0	0	0	0	
Detector 1 Position(ft)	0	0		0	0	0	0	0	0	0	0	
Detector 1 Size(ft)	20	6		20	6	20	20	6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Split	NA		Split	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	
Protected Phases	4	4		8	8	1	5	2	8	1	6	
Permitted Phases						8			2			
Detector Phase	4	4		8	8	1	5	2	8	1	6	
Switch Phase												
Minimum Initial (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	

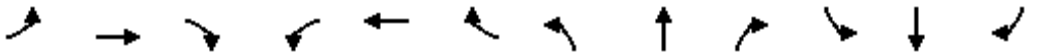


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Split (s)	40.0	40.0		11.0	11.0	10.0	10.0	30.0	11.0	10.0	23.0	
Total Split (s)	40.0	40.0		14.0	14.0	21.0	10.0	30.0	14.0	21.0	41.0	
Total Split (%)	38.1%	38.1%		13.3%	13.3%	20.0%	9.5%	28.6%	13.3%	20.0%	39.0%	
Maximum Green (s)	35.0	35.0		9.0	9.0	17.0	6.0	25.0	9.0	17.0	36.0	
Yellow Time (s)	4.0	4.0		4.0	4.0	3.0	3.0	4.0	4.0	3.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0	4.0	4.0	5.0	5.0	4.0	5.0	
Lead/Lag						Lag	Lead	Lead		Lag	Lag	
Lead-Lag Optimize?						Yes	Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	None		None	None	None	None	C-Max	None	None	C-Max	
Walk Time (s)	7.0	7.0						7.0			7.0	
Flash Dont Walk (s)	28.0	28.0						18.0			11.0	
Pedestrian Calls (#/hr)	5	5						5			5	
Act Effct Green (s)	14.3	14.3		20.6	20.6	39.4	7.0	36.4	61.9	17.0	50.5	
Actuated g/C Ratio	0.14	0.14		0.20	0.20	0.38	0.07	0.35	0.59	0.16	0.48	
v/c Ratio	0.33	0.19		0.53	0.58	0.38	0.32	0.69	0.32	1.50	0.64	
Control Delay	41.4	29.3		47.2	12.6	3.4	54.5	33.8	3.3	267.6	24.6	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	41.4	29.3		47.2	12.6	3.4	54.5	33.8	3.3	267.6	24.6	
LOS	D	C		D	B	A	D	C	A	F	C	
Approach Delay		36.8			17.3			28.3			109.4	
Approach LOS		D			B			C			F	
Queue Length 50th (ft)	52	23		109	14	0	25	253	0	~401	303	
Queue Length 95th (ft)	72	43		#297	#151	35	59	#410	62	#522	#425	
Internal Link Dist (ft)		480			545			514			446	
Turn Bay Length (ft)												
Base Capacity (vph)	590	604		329	495	740	117	1661	923	555	2431	
Starvation Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.14	0.08		0.53	0.58	0.38	0.32	0.69	0.32	1.50	0.64	

Intersection Summary			
Area Type:	Other		
Cycle Length: 105			
Actuated Cycle Length: 105			
Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Green			
Natural Cycle: 115			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.50			
Intersection Signal Delay: 67.7		Intersection LOS: E	
Intersection Capacity Utilization 73.7%		ICU Level of Service D	
Analysis Period (min) 15			
~ Volume exceeds capacity, queue is theoretically infinite.			
Queue shown is maximum after two cycles.			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 10: Soquel Canyon Pkwy & Pomona Rincon Rd





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	72	32	12	176	4	490	34	1000	293	750	1326	72
Future Volume (veh/h)	72	32	12	176	4	490	34	1000	293	750	1326	72
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	80	36	13	132	0	615	38	1111	326	833	1473	80
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	117	86	31	153	0	1602	68	1336	513	1451	3118	169
Arrive On Green	0.07	0.07	0.07	0.09	0.00	0.09	0.04	0.24	0.24	0.42	0.63	0.63
Sat Flow, veh/h	1781	1312	474	1781	0	3170	1781	5611	1585	3456	4957	269
Grp Volume(v), veh/h	80	0	49	132	0	615	38	1111	326	833	1012	541
Grp Sat Flow(s),veh/h/ln	1781	0	1785	1781	0	1585	1781	1870	1585	1728	1702	1822
Q Serve(g_s), s	4.6	0.0	2.8	7.7	0.0	0.0	2.2	19.8	18.4	19.4	16.5	16.5
Cycle Q Clear(g_c), s	4.6	0.0	2.8	7.7	0.0	0.0	2.2	19.8	18.4	19.4	16.5	16.5
Prop In Lane	1.00		0.27	1.00		1.00	1.00		1.00	1.00		0.15
Lane Grp Cap(c), veh/h	117	0	118	153	0	1602	68	1336	513	1451	2142	1146
V/C Ratio(X)	0.68	0.00	0.42	0.86	0.00	0.38	0.56	0.83	0.64	0.57	0.47	0.47
Avail Cap(c_a), veh/h	594	0	595	153	0	1602	102	1336	513	1451	2142	1146
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	48.0	0.0	47.1	47.4	0.0	15.9	49.6	38.0	30.2	23.3	10.3	10.3
Incr Delay (d2), s/veh	6.8	0.0	2.3	36.9	0.0	0.2	6.9	6.2	5.9	0.6	0.8	1.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.3	0.0	1.3	5.0	0.0	4.5	1.1	9.3	8.4	7.3	5.3	5.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	54.7	0.0	49.4	84.3	0.0	16.1	56.6	44.2	36.1	23.8	11.0	11.7
LnGrp LOS	D	A	D	F	A	B	E	D	D	C	B	B
Approach Vol, veh/h		129			747			1475			2386	
Approach Delay, s/veh		52.7			28.1			42.7			15.6	
Approach LOS		D			C			D			B	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	49.1	30.0		11.9	8.0	71.1		14.0				
Change Period (Y+Rc), s	5.0	* 5		5.0	4.0	5.0		5.0				
Max Green Setting (Gmax), s	17.0	* 25		35.0	6.0	36.0		9.0				
Max Q Clear Time (g_c+I1), s	21.4	21.8		6.6	4.2	18.5		9.7				
Green Ext Time (p_c), s	0.0	2.2		0.5	0.0	9.1		0.0				

Intersection Summary			
HCM 6th Ctrl Delay		27.0	
HCM 6th LOS		C	

Notes

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection Level Of Service Report
Intersection 11: Peyton Drive at Grand Avenue

Control Type:	Signalized	Delay (sec / veh):	39.8
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.735

Intersection Setup

Name	Peyton Drive			Peyton Drive			Grand Avenue			Grand Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	1	0	0	1	0	1	1	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Peyton Drive			Peyton Drive			Grand Avenue			Grand Avenue		
Base Volume Input [veh/h]	178	731	194	250	738	205	366	1141	183	286	634	290
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	178	731	194	250	738	205	366	1141	183	286	634	290
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	47	192	51	66	194	54	96	300	48	75	167	76
Total Analysis Volume [veh/h]	187	769	204	263	777	216	385	1201	193	301	667	305
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	1	6	0	5	2	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	15	39	0	15	39	0	27	50	0	16	39	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	28	0	0	24	0	0	31	0	0	28	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	R	L	C	C	L	C	R	L	C	R
C, Cycle Length [s]	120	120	120	120	120	120	120	120	120	120	120	120
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	9	39	39	11	42	42	16	42	42	12	38	38
g / C, Green / Cycle	0.07	0.33	0.33	0.09	0.35	0.35	0.13	0.35	0.35	0.10	0.31	0.31
(v / s)_i Volume / Saturation Flow Rate	0.06	0.13	0.11	0.08	0.18	0.17	0.11	0.32	0.10	0.09	0.18	0.16
s, saturation flow rate [veh/h]	3400	5700	1900	3400	3800	1900	3400	3800	1900	3400	3800	1900
c, Capacity [veh/h]	245	1873	624	314	1325	662	455	1313	656	342	1186	593
d1, Uniform Delay [s]	54.69	31.29	30.32	53.62	30.98	30.58	50.79	37.61	28.63	53.28	34.45	33.83
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	4.87	0.67	1.39	5.96	1.40	2.47	4.42	2.96	0.25	7.38	0.42	0.69
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.76	0.41	0.33	0.84	0.51	0.48	0.85	0.91	0.29	0.88	0.56	0.51
d, Delay for Lane Group [s/veh]	59.56	31.96	31.72	59.57	32.38	33.05	55.21	40.57	28.88	60.66	34.87	34.53
Lane Group LOS	E	C	C	E	C	C	E	D	C	E	C	C
Critical Lane Group	Yes	No	No	No	Yes	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	2.94	5.90	4.70	4.16	8.00	7.63	5.92	17.15	4.11	4.83	8.17	7.39
50th-Percentile Queue Length [ft/ln]	73.56	147.39	117.49	104.09	199.91	190.84	148.10	428.80	102.74	120.68	204.31	184.81
95th-Percentile Queue Length [veh/ln]	5.30	9.88	8.25	7.49	12.63	12.16	9.92	23.94	7.40	8.43	12.86	11.85
95th-Percentile Queue Length [ft/ln]	132.41	246.94	206.37	187.36	315.85	304.12	247.89	598.60	184.93	210.77	321.52	296.29

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	59.56	31.96	31.72	59.57	32.47	33.05	55.21	40.57	28.88	60.66	34.87	34.53
Movement LOS	E	C	C	E	C	C	E	D	C	E	C	C
d_A, Approach Delay [s/veh]	36.36			38.24			42.47			40.89		
Approach LOS	D			D			D			D		
d_I, Intersection Delay [s/veh]	39.83											
Intersection LOS	D											
Intersection V/C	0.735											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	49.52	49.52	49.52	49.52
l_p,int, Pedestrian LOS Score for Intersection	3.126	3.070	3.005	3.098
Crosswalk LOS	C	C	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	583	583	766	583
d_b, Bicycle Delay [s]	30.12	30.12	22.83	30.12
l_b,int, Bicycle LOS Score for Intersection	2.198	2.250	3.027	2.610
Bicycle LOS	B	B	C	B

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 12: Carbon Canyon Road at Fairway Drive/Ginseng Lane

Control Type:	Two-way stop	Delay (sec / veh):	6,883.1
Analysis Method:	HCM 7th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	11.452

Intersection Setup

Name	Carbon Canyon Road			Carbon Canyon Road			Fairway Drive			Ginseng Lane		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	0	0	0	1	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	45.00			45.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			No			No		

Volumes

Name	Carbon Canyon Road			Carbon Canyon Road			Fairway Drive			Ginseng Lane		
Base Volume Input [veh/h]	28	2083	4	9	910	37	34	0	27	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	28	2083	4	9	910	37	34	0	27	0	0	0
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	7	548	1	2	239	10	9	0	7	0	0	0
Total Analysis Volume [veh/h]	29	2193	4	9	958	39	36	0	28	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Free	Free	Stop	Stop
Flared Lane				No
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance			No	No
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.04	0.02	0.00	0.04	0.01	0.00	11.45	0.00	0.09	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	10.41	0.00	0.00	20.60	0.00	0.00	6883.08	6416.94	18.04	1296.97	702.54	68.14
Movement LOS	B	A	A	C	A	A	F	F	C	F	F	F
95th-Percentile Queue Length [veh/ln]	0.13	0.00	0.00	0.12	0.00	0.00	6.26	6.26	0.30	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	3.27	0.00	0.00	2.91	0.00	0.00	156.57	156.57	7.54	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	0.14			0.18			3879.62			689.22		
Approach LOS	A			A			F			F		
d_I, Intersection Delay [s/veh]	75.48											
Intersection LOS	F											

Intersection Level Of Service Report
Intersection 13: Carbon Canyon Road at Canyon Hills Road

Control Type:	Two-way stop	Delay (sec / veh):	5,766.4
Analysis Method:	HCM 7th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	10.475

Intersection Setup

Name	Carbon Canyon Road			Carbon Canyon Road			Canyon Hills Road			Canyon Hills Road		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	1	0	0	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	45.00			45.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			No			No		

Volumes

Name	Carbon Canyon Road			Carbon Canyon Road			Canyon Hills Road			Canyon Hills Road		
Base Volume Input [veh/h]	27	2101	15	19	844	60	38	0	32	8	0	11
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	27	2101	15	19	844	60	38	0	32	8	0	11
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	7	553	4	5	222	16	10	0	8	2	0	3
Total Analysis Volume [veh/h]	28	2212	16	20	888	63	40	0	34	8	0	12
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Free	Free	Stop	Stop
Flared Lane			No	No
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance			No	No
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.04	0.02	0.00	0.09	0.01	0.00	10.47	0.00	0.10	1.86	0.00	0.22
d_M, Delay for Movement [s/veh]	10.19	0.00	0.00	21.89	0.00	0.00	5766.41	5261.34	4834.63	1725.89	1341.70	953.38
Movement LOS	B	A	A	C	A	A	F	F	F	F	F	F
95th-Percentile Queue Length [veh/ln]	0.12	0.00	0.00	0.28	0.00	0.00	10.92	10.92	10.92	3.46	3.46	3.46
95th-Percentile Queue Length [ft/ln]	3.02	0.00	0.00	6.97	0.00	0.00	272.93	272.93	272.93	86.59	86.59	86.59
d_A, Approach Delay [s/veh]	0.13			0.45			5338.29			1262.38		
Approach LOS	A			A			F			F		
d_I, Intersection Delay [s/veh]	126.77											
Intersection LOS	F											

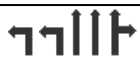
APPENDIX F-III

YEAR 2040 WITH PROJECT WITH MITIGATION TRAFFIC CONDITIONS

Intersection Level Of Service Report
Intersection 2: Gateway Village/Boys Republic Drive at Grand Avenue

Control Type:	Signalized	Delay (sec / veh):	25.7
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.635

Intersection Setup

Name	Boys Republic Drive			Gateway Village			Grand Avenue			Grand Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	1	1	0	0	1	0	0	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			No		

Volumes

Name	Boys Republic Drive			Gateway Village			Grand Avenue			Grand Avenue		
Base Volume Input [veh/h]	56	30	499	92	37	39	55	801	16	567	1288	86
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	56	30	499	92	37	39	55	801	16	567	1288	86
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	15	8	131	24	10	10	14	211	4	149	339	23
Total Analysis Volume [veh/h]	59	32	525	97	39	41	58	843	17	597	1356	91
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Split	Split	Overlap	Split	Split	Split	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	0	8	8	0	4	0	5	2	0	1	6	0
Auxiliary Signal Groups			1,8									
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	0	6	6	0	6	0	6	6	0	6	6	0
Maximum Green [s]	0	30	30	0	30	0	30	30	0	30	30	0
Amber [s]	0.0	3.0	3.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	1.0	1.0	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	10	10	0	35	0	10	25	0	40	55	0
Vehicle Extension [s]	0.0	3.0	3.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	0	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	24	0	0	14	0	0	11	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	2.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	2.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall		No	No		No		No	No		No	No	
Maximum Recall		No	No		No		No	No		No	No	
Pedestrian Recall		No	No		No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	R	L	C	L	C	C	L	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	14	42	8	8	5	49	49	24	67	67
g / C, Green / Cycle	0.13	0.38	0.07	0.07	0.05	0.44	0.44	0.22	0.61	0.61
(v / s)_i Volume / Saturation Flow Rate	0.05	0.28	0.05	0.05	0.03	0.15	0.15	0.18	0.25	0.26
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1800	3800	1900	3400	3800	1900
c, Capacity [veh/h]	228	720	127	127	83	1678	839	734	2323	1162
d1, Uniform Delay [s]	44.25	29.36	50.03	49.98	51.75	20.16	20.31	41.04	11.11	11.20
k, delay calibration	0.11	0.34	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.13	4.47	6.90	6.47	10.02	0.54	1.16	2.24	0.54	1.12
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.40	0.73	0.70	0.69	0.70	0.34	0.35	0.81	0.41	0.42
d, Delay for Lane Group [s/veh]	45.38	33.84	56.93	56.45	61.77	20.71	21.47	43.29	11.65	12.32
Lane Group LOS	D	C	E	E	E	C	C	D	B	B
Critical Lane Group	No	Yes	Yes	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	2.35	12.58	2.65	2.58	1.81	4.83	5.21	7.87	5.92	6.28
50th-Percentile Queue Length [ft/ln]	58.87	314.61	66.18	64.48	45.17	120.85	130.15	196.63	147.94	156.94
95th-Percentile Queue Length [veh/ln]	4.24	18.40	4.76	4.64	3.25	8.44	8.95	12.46	9.91	10.39
95th-Percentile Queue Length [ft/ln]	105.97	460.06	119.12	116.06	81.31	210.99	223.70	311.61	247.68	259.66

Movement, Approach, & Intersection Results

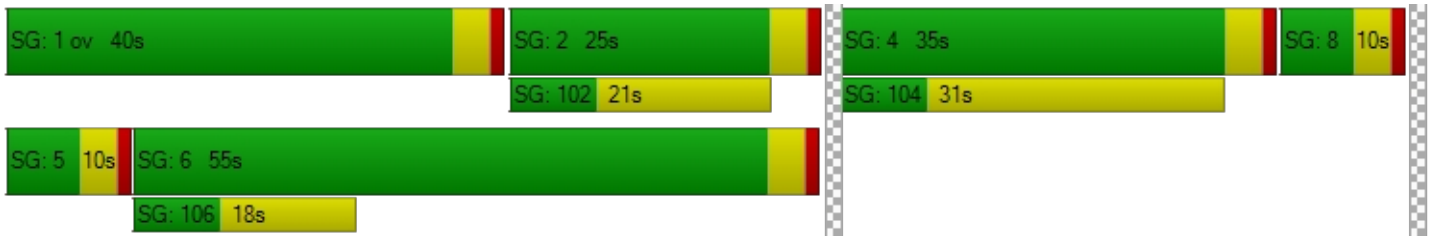
d_M, Delay for Movement [s/veh]	45.38	45.38	33.84	56.89	56.45	56.45	61.77	20.96	21.47	43.29	11.85	12.32
Movement LOS	D	D	C	E	E	E	E	C	C	D	B	B
d_A, Approach Delay [s/veh]	35.54			56.69			23.54			21.05		
Approach LOS	D			E			C			C		
d_I, Intersection Delay [s/veh]	25.72											
Intersection LOS	C											
Intersection V/C	0.635											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	0.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	44.58	44.58	44.58	0.00
l_p,int, Pedestrian LOS Score for Intersection	2.450	2.066	2.934	0.000
Crosswalk LOS	B	B	C	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	109	563	382	927
d_b, Bicycle Delay [s]	49.19	28.39	36.03	15.84
l_b,int, Bicycle LOS Score for Intersection	2.576	1.852	2.065	2.684
Bicycle LOS	B	A	B	B

Sequence

Ring 1	1	2	4	8	-	-	-	-	-	-	-	-	-	-	-	-	
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	



Intersection Level Of Service Report

Intersection 4: Rustic Drive/Carbon Canyon Road at Chino Hills Parkway

Control Type:	Signalized	Delay (sec / veh):	30.5
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.825

Intersection Setup

Name	Carbon Canyon Road			Rustic Drive			Chino Hills Parkway			Chino Hills Parkway		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	1	0	0	1	0	1	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			No		

Volumes

Name	Carbon Canyon Road			Rustic Drive			Chino Hills Parkway			Chino Hills Parkway		
Base Volume Input [veh/h]	238	1	674	31	1	1	17	396	324	1929	823	9
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	238	1	674	31	1	1	17	396	324	1929	823	9
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	63	0	177	8	0	0	4	104	85	508	217	2
Total Analysis Volume [veh/h]	251	1	709	33	1	1	18	417	341	2031	866	9
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Permiss	Permiss	Unsigna	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	0	8	0	0	4	0	5	2	0	1	6	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	0	6	0	0	6	0	6	6	0	6	6	0
Maximum Green [s]	0	30	0	0	30	0	30	30	0	30	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	32	0	0	32	0	10	29	0	59	78	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	0	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	21	0	0	18	0	0	11	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall		No			No		No	No		No	No	
Maximum Recall		No			No		No	No		No	No	
Pedestrian Recall		No			No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	L	C	L	C	R	L	C	C
C, Cycle Length [s]	120	120	120	120	120	120	120	120	120	120
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	19	19	19	19	3	36	36	54	87	87
g / C, Green / Cycle	0.16	0.16	0.16	0.16	0.02	0.30	0.30	0.45	0.72	0.72
(v / s)_i Volume / Saturation Flow Rate	0.14	0.00	0.02	0.00	0.01	0.11	0.18	0.42	0.23	0.23
s, saturation flow rate [veh/h]	1800	1900	1800	1900	1800	3800	1900	4800	1900	1900
c, Capacity [veh/h]	309	295	310	295	42	1131	566	2144	1370	1370
d1, Uniform Delay [s]	49.70	42.79	43.57	42.82	57.77	33.22	36.04	31.82	6.06	6.06
k, delay calibration	0.13	0.11	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	5.95	0.00	0.15	0.01	6.72	0.93	4.70	2.90	0.62	0.62
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.81	0.00	0.11	0.01	0.43	0.37	0.60	0.95	0.32	0.32
d, Delay for Lane Group [s/veh]	55.65	42.80	43.72	42.83	64.49	34.14	40.74	34.72	6.67	6.67
Lane Group LOS	E	D	D	D	E	C	D	C	A	A
Critical Lane Group	Yes	No	No	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	7.88	0.03	0.86	0.05	0.62	4.95	9.27	18.82	3.87	3.87
50th-Percentile Queue Length [ft/ln]	196.92	0.64	21.55	1.28	15.45	123.82	231.75	470.43	96.76	96.76
95th-Percentile Queue Length [veh/ln]	12.48	0.05	1.55	0.09	1.11	8.60	14.26	25.93	6.97	6.97
95th-Percentile Queue Length [ft/ln]	311.99	1.15	38.79	2.31	27.82	215.07	356.59	648.29	174.17	174.17

Movement, Approach, & Intersection Results

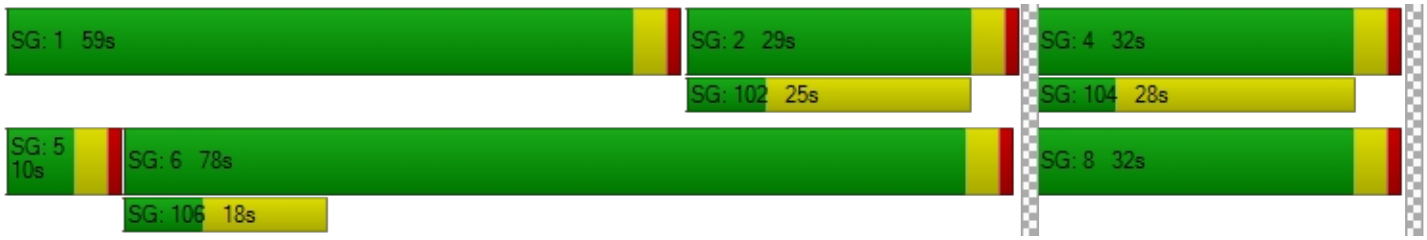
d_M, Delay for Movement [s/veh]	55.65	42.80	0.00	43.72	42.83	42.83	64.49	34.14	40.74	34.72	6.67	6.67
Movement LOS	E	D		D	D	D	E	C	D	C	A	A
d_A, Approach Delay [s/veh]	55.60			43.67			37.75			26.27		
Approach LOS	E			D			D			C		
d_I, Intersection Delay [s/veh]	30.53											
Intersection LOS	C											
Intersection V/C	0.825											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	0.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	49.49	49.49	49.49	0.00
l_p,int, Pedestrian LOS Score for Intersection	2.893	1.974	3.131	0.000
Crosswalk LOS	C	A	C	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	467	467	417	1234
d_b, Bicycle Delay [s]	35.25	35.25	37.59	8.81
l_b,int, Bicycle LOS Score for Intersection	1.975	1.617	2.200	3.957
Bicycle LOS	A	A	B	D

Sequence

Ring 1	1	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 5: Peyton Drive at Chino Hills Parkway

Control Type:	Signalized	Delay (sec / veh):	39.0
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.927

Intersection Setup

Name	Peyton Drive			Peyton Drive			Chino Hills Parkway			Chino Hills Parkway		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	1	1	0	1	1	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Peyton Drive			Peyton Drive			Chino Hills Parkway			Chino Hills Parkway		
Base Volume Input [veh/h]	607	413	307	201	225	401	219	648	155	210	1357	287
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	607	413	307	201	225	401	219	648	155	210	1357	287
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	160	109	81	53	59	106	58	171	41	55	357	76
Total Analysis Volume [veh/h]	639	435	323	212	237	422	231	682	163	221	1428	302
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Overlap	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	3	8	0	7	4	4	5	2	0	1	6	0
Auxiliary Signal Groups						4,5						
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	6	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	30	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	1.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	26	35	0	27	36	36	13	32	0	16	35	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	7	0	7	0	0	7	0
Pedestrian Clearance [s]	0	24	0	0	24	24	0	21	0	0	24	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No	No	No	No		No	No	
Maximum Recall	No	No		No	No	No	No	No		No	No	
Pedestrian Recall	No	No		No	No	No	No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	R	L	C	R	L	C	R
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	22	26	26	9	14	27	9	49	49	9	49	49
g / C, Green / Cycle	0.20	0.24	0.24	0.08	0.12	0.24	0.08	0.45	0.45	0.08	0.45	0.45
(v / s)_i Volume / Saturation Flow Rate	0.19	0.21	0.19	0.06	0.06	0.22	0.07	0.18	0.09	0.07	0.38	0.16
s, saturation flow rate [veh/h]	3400	1900	1900	3400	3800	1900	3400	3800	1900	3400	3800	1900
c, Capacity [veh/h]	680	457	457	286	472	462	280	1696	848	286	1702	851
d1, Uniform Delay [s]	43.38	40.30	39.09	49.26	45.03	40.55	49.72	20.58	18.47	49.39	26.89	19.96
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.28	0.11	0.50	0.50	0.11	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	7.03	5.68	2.92	3.79	0.83	16.33	6.02	0.71	0.50	4.43	5.15	1.16
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.94	0.88	0.78	0.74	0.50	0.91	0.82	0.40	0.19	0.77	0.84	0.35
d, Delay for Lane Group [s/veh]	50.41	45.98	42.02	53.05	45.86	56.88	55.74	21.29	18.97	53.82	32.04	21.11
Lane Group LOS	D	D	D	D	D	E	E	C	B	D	C	C
Critical Lane Group	Yes	No	No	No	No	Yes	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	9.15	11.10	9.28	2.99	3.08	13.10	3.35	5.99	2.62	3.15	17.19	5.29
50th-Percentile Queue Length [ft/ln]	228.77	277.45	232.05	74.78	76.88	327.45	83.85	149.82	65.45	78.64	429.86	132.24
95th-Percentile Queue Length [veh/ln]	14.11	16.56	14.28	5.38	5.54	19.03	6.04	10.01	4.71	5.66	24.00	9.06
95th-Percentile Queue Length [ft/ln]	352.80	414.03	356.96	134.60	138.39	475.83	150.93	250.19	117.81	141.54	599.88	226.54

Movement, Approach, & Intersection Results

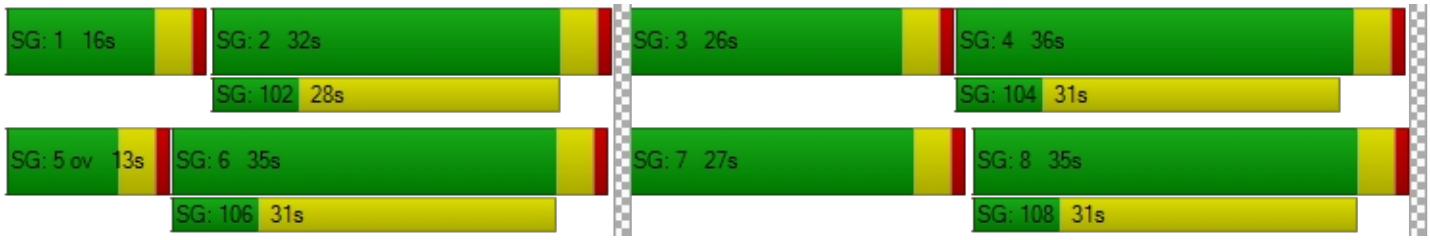
d_M, Delay for Movement [s/veh]	50.41	45.68	42.02	53.05	45.86	56.88	55.74	21.29	18.97	53.82	32.04	21.11
Movement LOS	D	D	D	D	D	E	E	C	B	D	C	C
d_A, Approach Delay [s/veh]	46.99			52.95			28.33			32.81		
Approach LOS	D			D			C			C		
d_I, Intersection Delay [s/veh]	38.96											
Intersection LOS	D											
Intersection V/C	0.927											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	44.58	44.58	44.58	44.58
l_p,int, Pedestrian LOS Score for Intersection	2.790	2.860	3.100	3.045
Crosswalk LOS	C	C	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	563	582	509	563
d_b, Bicycle Delay [s]	28.39	27.68	30.59	28.39
l_b,int, Bicycle LOS Score for Intersection	2.712	2.278	2.447	3.169
Bicycle LOS	B	B	B	C

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 7: Pipeline Avenue at Woodview Road

Control Type:	Signalized	Delay (sec / veh):	23.1
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.578

Intersection Setup

Name	Pipeline Avenue		Pipeline Avenue		Woodview Road	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	40.00		30.00		35.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	No		No		No	
Crosswalk	Yes		No		Yes	

Volumes

Name	Pipeline Avenue		Pipeline Avenue		Woodview Road	
Base Volume Input [veh/h]	195	419	293	57	119	212
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00					
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	195	419	293	57	119	212
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	51	110	77	15	31	56
Total Analysis Volume [veh/h]	205	441	308	60	125	223
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0		0		0	
v_di, Inbound Pedestrian Volume crossing m	0		0		0	
v_co, Outbound Pedestrian Volume crossing	0		0		0	
v_ci, Inbound Pedestrian Volume crossing mi	0		0		0	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Protected	Permissive	Permissive	Permissive	Permissive	Permissive
Signal Group	1	6	2	0	3	0
Auxiliary Signal Groups						
Lead / Lag	Lead	-	-	-	Lead	-
Minimum Green [s]	6	6	6	0	6	0
Maximum Green [s]	30	30	30	0	30	0
Amber [s]	3.0	3.0	3.0	0.0	3.0	0.0
All red [s]	1.0	1.0	1.0	0.0	1.0	0.0
Split [s]	21	39	18	0	51	0
Vehicle Extension [s]	3.0	3.0	3.0	0.0	3.0	0.0
Walk [s]	0	0	7	0	7	0
Pedestrian Clearance [s]	0	0	7	0	11	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No	No		No	
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	2.0	0.0	2.0	0.0
Minimum Recall	No	No	No		No	
Maximum Recall	No	No	No		No	
Pedestrian Recall	No	No	No		No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	C
C, Cycle Length [s]	90	90	90	90
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	12	62	46	20
g / C, Green / Cycle	0.14	0.69	0.51	0.22
(v / s)_i Volume / Saturation Flow Rate	0.11	0.23	0.19	0.19
s, saturation flow rate [veh/h]	1800	1900	1900	1800
c, Capacity [veh/h]	244	1314	972	396
d1, Uniform Delay [s]	37.99	5.59	13.32	33.97
k, delay calibration	0.11	0.50	0.50	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	7.66	0.69	1.12	6.41
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.84	0.34	0.38	0.88
d, Delay for Lane Group [s/veh]	45.64	6.28	14.45	40.38
Lane Group LOS	D	A	B	D
Critical Lane Group	Yes	No	Yes	Yes
50th-Percentile Queue Length [veh/ln]	4.75	2.77	4.56	7.78
50th-Percentile Queue Length [ft/ln]	118.74	69.15	113.92	194.53
95th-Percentile Queue Length [veh/ln]	8.32	4.98	8.06	12.36
95th-Percentile Queue Length [ft/ln]	208.10	124.48	201.44	308.89

Movement, Approach, & Intersection Results

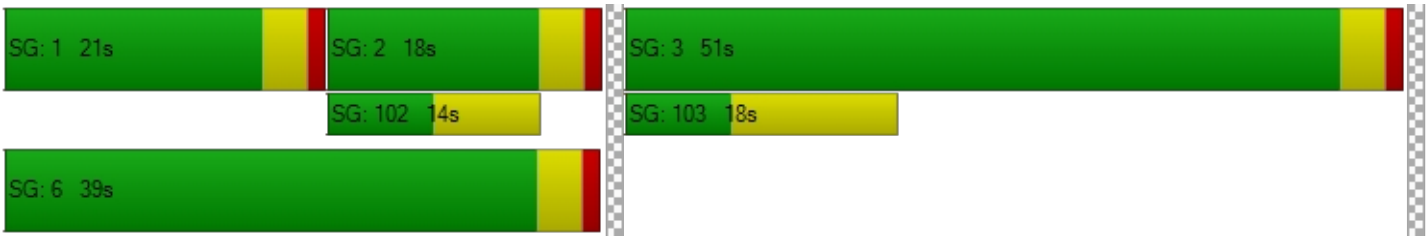
d_M, Delay for Movement [s/veh]	45.64	6.28	14.45	14.45	40.38	40.38
Movement LOS	D	A	B	B	D	D
d_A, Approach Delay [s/veh]	18.77		14.45		40.38	
Approach LOS	B		B		D	
d_I, Intersection Delay [s/veh]	23.12					
Intersection LOS	C					
Intersection V/C	0.578					

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	0.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	34.68	0.00	34.68
l_p,int, Pedestrian LOS Score for Intersection	2.450	0.000	2.063
Crosswalk LOS	B	F	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	778	311	1044
d_b, Bicycle Delay [s]	16.82	32.10	10.28
l_b,int, Bicycle LOS Score for Intersection	2.626	2.167	2.134
Bicycle LOS	B	B	B

Sequence

Ring 1	1	2	3	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 8: Pipeline Avenue at Soquel Canyon Parkway

Control Type:	Signalized	Delay (sec / veh):	18.5
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.594

Intersection Setup

Name	Pipeline Avenue		Soquel Canyon Parkway		Soquel Canyon Parkway	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	1	0	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	40.00		45.00		50.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	No		No		No	
Crosswalk	Yes		Yes		No	

Volumes

Name	Pipeline Avenue		Soquel Canyon Parkway		Soquel Canyon Parkway	
Base Volume Input [veh/h]	497	27	48	287	267	424
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00					
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	497	27	48	287	267	424
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	131	7	13	76	70	112
Total Analysis Volume [veh/h]	523	28	51	302	281	446
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0		0		0	
v_di, Inbound Pedestrian Volume crossing m	0		0		0	
v_co, Outbound Pedestrian Volume crossing	0		0		0	
v_ci, Inbound Pedestrian Volume crossing mi	0		0		0	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive
Signal Group	7	0	0	2	6	0
Auxiliary Signal Groups						
Lead / Lag	Lead	-	-	-	-	-
Minimum Green [s]	6	0	0	6	6	0
Maximum Green [s]	30	0	0	30	30	0
Amber [s]	3.0	0.0	0.0	3.0	3.0	0.0
All red [s]	1.0	0.0	0.0	1.0	1.0	0.0
Split [s]	64	0	0	26	26	0
Vehicle Extension [s]	3.0	0.0	0.0	3.0	3.0	0.0
Walk [s]	7	0	0	0	7	0
Pedestrian Clearance [s]	21	0	0	0	7	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk	No			No	No	
I1, Start-Up Lost Time [s]	2.0	0.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	0.0	0.0	2.0	2.0	0.0
Minimum Recall	No			No	No	
Maximum Recall	No			No	No	
Pedestrian Recall	No			No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	L	C	C	R
C, Cycle Length [s]	90	90	90	90	90
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	2.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	30	52	52	52	52
g / C, Green / Cycle	0.33	0.58	0.58	0.58	0.58
(v / s)_i Volume / Saturation Flow Rate	0.31	0.03	0.05	0.07	0.23
s, saturation flow rate [veh/h]	1800	1800	5700	3800	1900
c, Capacity [veh/h]	596	1018	3304	2203	1101
d1, Uniform Delay [s]	28.94	8.17	8.38	8.57	10.37
k, delay calibration	0.11	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	6.63	0.09	0.05	0.12	1.11
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.92	0.05	0.09	0.13	0.40
d, Delay for Lane Group [s/veh]	35.57	8.26	8.44	8.69	11.48
Lane Group LOS	D	A	A	A	B
Critical Lane Group	Yes	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	11.70	0.39	0.76	1.06	4.26
50th-Percentile Queue Length [ft/ln]	292.42	9.78	18.89	26.41	106.40
95th-Percentile Queue Length [veh/ln]	17.31	0.70	1.36	1.90	7.64
95th-Percentile Queue Length [ft/ln]	432.65	17.60	33.99	47.53	190.99

Movement, Approach, & Intersection Results

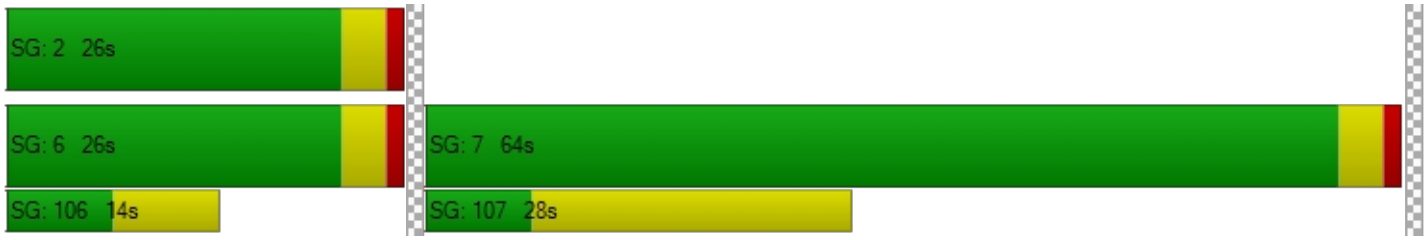
d_M, Delay for Movement [s/veh]	35.57	35.57	8.26	8.44	8.69	11.48
Movement LOS	D	D	A	A	A	B
d_A, Approach Delay [s/veh]	35.57		8.41		10.40	
Approach LOS	D		A		B	
d_I, Intersection Delay [s/veh]	18.47					
Intersection LOS	B					
Intersection V/C	0.594					

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	34.63	34.63	0.00
l_p,int, Pedestrian LOS Score for Intersection	2.468	2.614	0.000
Crosswalk LOS	B	B	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	1335	489	489
d_b, Bicycle Delay [s]	4.98	25.65	25.65
l_b,int, Bicycle LOS Score for Intersection	2.469	1.754	2.159
Bicycle LOS	B	A	B

Sequence

Ring 1	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	7	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 2: Gateway Village/Boys Republic Drive at Grand Avenue

Control Type:	Signalized	Delay (sec / veh):	49.0
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.011

Intersection Setup

Name	Boys Republic Drive			Gateway Village			Grand Avenue			Grand Avenue		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	1	1	0	0	1	0	0	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			No		

Volumes

Name	Boys Republic Drive			Gateway Village			Grand Avenue			Grand Avenue		
Base Volume Input [veh/h]	37	36	745	290	57	77	121	1471	62	870	1358	140
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	37	36	745	290	57	77	121	1471	62	870	1358	140
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	10	9	196	76	15	20	32	387	16	229	357	37
Total Analysis Volume [veh/h]	39	38	784	305	60	81	127	1548	65	916	1429	147
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Split	Split	Overlap	Split	Split	Split	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	0	8	8	0	4	0	5	2	0	1	6	0
Auxiliary Signal Groups			1,8									
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	0	6	6	0	6	0	6	6	0	6	6	0
Maximum Green [s]	0	30	30	0	30	0	30	30	0	30	30	0
Amber [s]	0.0	3.0	3.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	1.0	1.0	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	10	10	0	35	0	14	39	0	36	61	0
Vehicle Extension [s]	0.0	3.0	3.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	0	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	24	0	0	14	0	0	11	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	2.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	2.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall		No	No		No		No	No		No	No	
Maximum Recall		No	No		No		No	No		No	No	
Pedestrian Recall		No	No		No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	R	L	C	L	C	C	L	C	C
C, Cycle Length [s]	120	120	120	120	120	120	120	120	120	120
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	19	55	18	18	10	35	35	32	57	57
g / C, Green / Cycle	0.16	0.46	0.15	0.15	0.08	0.29	0.29	0.27	0.48	0.48
(v / s)_i Volume / Saturation Flow Rate	0.04	0.41	0.13	0.12	0.07	0.28	0.29	0.27	0.27	0.28
s, saturation flow rate [veh/h]	1800	1900	1800	1800	1800	3800	1900	3400	3800	1900
c, Capacity [veh/h]	287	873	265	265	151	1115	557	906	1810	905
d1, Uniform Delay [s]	44.31	29.88	49.89	49.68	54.22	41.64	42.13	44.02	22.68	22.90
k, delay calibration	0.11	0.50	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.50	13.98	7.62	6.47	11.92	18.15	34.32	16.58	1.34	2.82
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.27	0.90	0.85	0.83	0.84	0.96	0.98	1.01	0.58	0.59
d, Delay for Lane Group [s/veh]	44.81	43.86	57.51	56.15	66.14	59.79	76.45	60.60	24.02	25.73
Lane Group LOS	D	D	E	E	E	E	E	F	C	C
Critical Lane Group	No	Yes	Yes	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	2.06	23.57	7.18	6.86	4.28	18.12	21.26	15.41	10.81	11.56
50th-Percentile Queue Length [ft/ln]	51.50	589.19	179.42	171.60	106.98	453.00	531.54	385.28	270.25	288.88
95th-Percentile Queue Length [veh/ln]	3.71	31.53	11.57	11.16	7.67	25.10	28.82	21.99	16.20	17.13
95th-Percentile Queue Length [ft/ln]	92.70	788.23	289.26	279.02	191.79	627.53	720.59	549.79	405.05	428.25

Movement, Approach, & Intersection Results

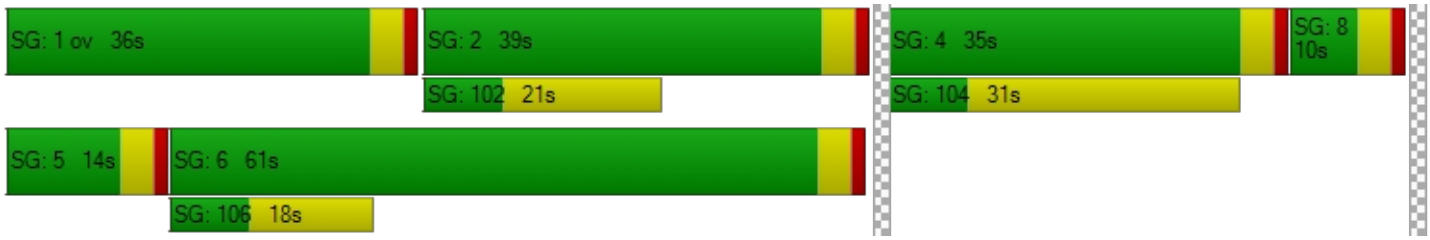
d_M, Delay for Movement [s/veh]	44.81	44.81	43.86	57.15	56.15	56.15	66.14	64.99	76.45	60.60	24.48	25.73
Movement LOS	D	D	D	E	E	E	E	E	E	F	C	C
d_A, Approach Delay [s/veh]	43.95			56.84			65.50			37.83		
Approach LOS	D			E			E			D		
d_I, Intersection Delay [s/veh]	49.01											
Intersection LOS	D											
Intersection V/C	1.011											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	0.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	49.51	49.51	49.51	0.00
l_p,int, Pedestrian LOS Score for Intersection	2.608	2.200	3.066	0.000
Crosswalk LOS	B	B	C	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	100	517	583	950
d_b, Bicycle Delay [s]	54.16	33.01	30.11	16.54
l_b,int, Bicycle LOS Score for Intersection	2.980	2.296	2.517	2.930
Bicycle LOS	C	B	B	C

Sequence

Ring 1	1	2	4	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 4: Rustic Drive/Carbon Canyon Road at Chino Hills Parkway

Control Type:	Signalized	Delay (sec / veh):	24.6
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.699

Intersection Setup

Name	Carbon Canyon Road			Rustic Drive			Chino Hills Parkway			Chino Hills Parkway		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	1	1	0	0	1	0	1	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			No		

Volumes

Name	Carbon Canyon Road			Rustic Drive			Chino Hills Parkway			Chino Hills Parkway		
Base Volume Input [veh/h]	288	1	2071	24	1	1	12	869	215	938	820	35
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	288	1	2071	24	1	1	12	869	215	938	820	35
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	76	0	545	6	0	0	3	229	57	247	216	9
Total Analysis Volume [veh/h]	303	1	2180	25	1	1	13	915	226	987	863	37
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Permiss	Permiss	Unsigna	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	0	8	0	0	4	0	5	2	0	1	6	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	0	6	0	0	6	0	6	6	0	6	6	0
Maximum Green [s]	0	30	0	0	30	0	30	30	0	30	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	32	0	0	32	0	10	29	0	39	58	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	0	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	21	0	0	18	0	0	11	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall		No			No		No	No		No	No	
Maximum Recall		No			No		No	No		No	No	
Pedestrian Recall		No			No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	L	C	L	C	R	L	C	C
C, Cycle Length [s]	100	100	100	100	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	19	19	19	19	2	45	45	24	67	67
g / C, Green / Cycle	0.19	0.19	0.19	0.19	0.02	0.45	0.45	0.24	0.67	0.67
(v / s)_i Volume / Saturation Flow Rate	0.17	0.00	0.01	0.00	0.01	0.24	0.12	0.21	0.24	0.24
s, saturation flow rate [veh/h]	1800	1900	1800	1900	1800	3800	1900	4800	1900	1900
c, Capacity [veh/h]	375	357	375	357	35	1700	850	1175	1278	1278
d1, Uniform Delay [s]	39.65	33.00	33.44	33.01	48.44	20.12	17.34	35.90	7.02	7.01
k, delay calibration	0.13	0.11	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	4.94	0.00	0.07	0.01	6.55	1.23	0.77	1.70	0.76	0.76
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.81	0.00	0.07	0.01	0.37	0.54	0.27	0.84	0.35	0.35
d, Delay for Lane Group [s/veh]	44.59	33.00	33.52	33.02	54.99	21.35	18.10	37.60	7.78	7.77
Lane Group LOS	D	C	C	C	D	C	B	D	A	A
Critical Lane Group	Yes	No	No	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	7.68	0.02	0.51	0.04	0.38	7.80	3.38	7.68	3.92	3.91
50th-Percentile Queue Length [ft/ln]	192.08	0.50	12.66	1.00	9.56	195.05	84.46	191.98	98.09	97.87
95th-Percentile Queue Length [veh/ln]	12.23	0.04	0.91	0.07	0.69	12.38	6.08	12.22	7.06	7.05
95th-Percentile Queue Length [ft/ln]	305.72	0.90	22.80	1.80	17.21	309.57	152.03	305.59	176.57	176.17

Movement, Approach, & Intersection Results

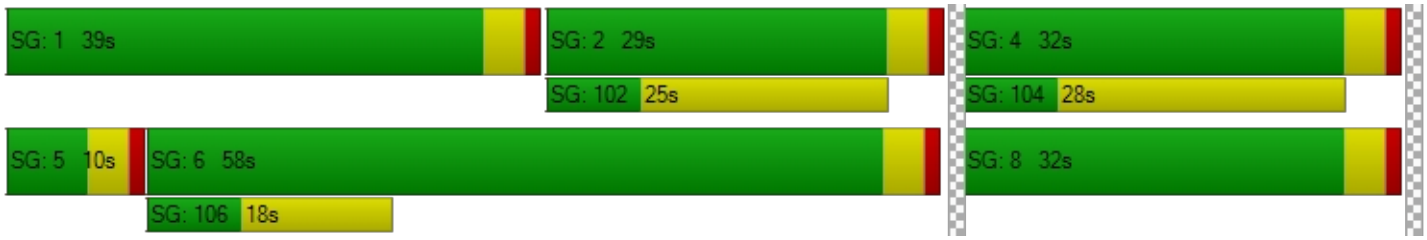
d_M, Delay for Movement [s/veh]	44.59	33.00	0.00	33.52	33.02	33.02	54.99	21.35	18.10	37.60	7.78	7.77
Movement LOS	D	C		C	C	C	D	C	B	D	A	A
d_A, Approach Delay [s/veh]	44.56			33.48			21.09			23.37		
Approach LOS	D			C			C			C		
d_I, Intersection Delay [s/veh]	24.58											
Intersection LOS	C											
Intersection V/C	0.699											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	0.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	39.61	39.61	39.61	0.00
l_p,int, Pedestrian LOS Score for Intersection	2.704	1.970	3.266	0.000
Crosswalk LOS	B	A	C	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	560	560	500	1080
d_b, Bicycle Delay [s]	25.92	25.92	28.13	10.58
l_b,int, Bicycle LOS Score for Intersection	2.061	1.604	2.512	3.116
Bicycle LOS	B	A	B	C

Sequence

Ring 1	1	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 5: Peyton Drive at Chino Hills Parkway

Control Type:	Signalized	Delay (sec / veh):	41.7
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.904

Intersection Setup

Name	Peyton Drive			Peyton Drive			Chino Hills Parkway			Chino Hills Parkway		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	1	1	0	1	1	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Peyton Drive			Peyton Drive			Chino Hills Parkway			Chino Hills Parkway		
Base Volume Input [veh/h]	238	300	213	402	448	219	403	1524	552	274	1152	353
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	238	300	213	402	448	219	403	1524	552	274	1152	353
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	63	79	56	106	118	58	106	401	145	72	303	93
Total Analysis Volume [veh/h]	251	316	224	423	472	231	424	1604	581	288	1213	372
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	16.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Overlap	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	3	8	0	7	4	4	5	2	0	1	6	0
Auxiliary Signal Groups						4,5						
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	6	6	6	0	6	6	0
Maximum Green [s]	30	30	0	30	30	30	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	1.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	19	35	0	19	35	35	21	52	0	14	45	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	7	0	7	0	0	7	0
Pedestrian Clearance [s]	0	24	0	0	24	24	0	21	0	0	24	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No	No	No	No		No	No	
Maximum Recall	No	No		No	No	No	No	No		No	No	
Pedestrian Recall	No	No		No	No	No	No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	R	L	C	R	L	C	R
C, Cycle Length [s]	120	120	120	120	120	120	120	120	120	120	120	120
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	11	21	21	15	25	46	17	58	58	10	51	51
g / C, Green / Cycle	0.09	0.17	0.17	0.13	0.21	0.38	0.14	0.48	0.48	0.08	0.43	0.43
(v / s)_i Volume / Saturation Flow Rate	0.07	0.15	0.13	0.12	0.12	0.12	0.12	0.42	0.31	0.08	0.32	0.20
s, saturation flow rate [veh/h]	3400	1900	1900	3400	3800	1900	3400	3800	1900	3400	3800	1900
c, Capacity [veh/h]	313	331	331	426	790	725	477	1835	918	285	1621	811
d1, Uniform Delay [s]	53.45	48.27	47.15	52.44	43.01	26.14	50.69	27.76	23.11	54.99	28.99	24.54
k, delay calibration	0.11	0.15	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.11	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	4.82	9.66	3.55	18.44	0.73	0.25	5.84	6.13	3.32	27.01	3.21	1.87
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.80	0.87	0.76	0.99	0.60	0.32	0.89	0.87	0.63	1.01	0.75	0.46
d, Delay for Lane Group [s/veh]	58.26	57.92	50.70	70.89	43.74	26.40	56.52	33.90	26.43	82.00	32.19	26.41
Lane Group LOS	E	E	D	E	D	C	E	C	C	F	C	C
Critical Lane Group	No	Yes	No	Yes	No	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	3.92	9.29	7.45	7.44	6.42	4.72	6.63	21.45	12.84	5.38	15.17	7.92
50th-Percentile Queue Length [ft/ln]	98.05	232.31	186.32	186.03	160.51	117.94	165.81	536.37	321.04	134.52	379.22	198.04
95th-Percentile Queue Length [veh/ln]	7.06	14.29	11.93	11.91	10.58	8.28	10.86	29.05	18.72	9.21	21.56	12.54
95th-Percentile Queue Length [ft/ln]	176.49	357.29	298.25	297.87	264.40	206.99	271.39	726.28	467.96	230.35	538.90	313.44

Movement, Approach, & Intersection Results

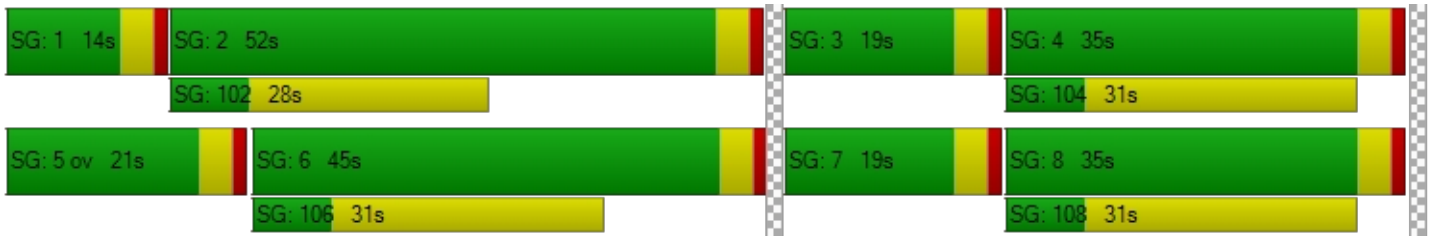
d_M, Delay for Movement [s/veh]	58.26	57.31	50.70	70.89	43.74	26.40	56.52	33.90	26.43	82.00	32.19	26.41
Movement LOS	E	E	D	E	D	C	E	C	C	F	C	C
d_A, Approach Delay [s/veh]	55.74			50.38			35.91			38.70		
Approach LOS	E			D			D			D		
d_I, Intersection Delay [s/veh]	41.73											
Intersection LOS	D											
Intersection V/C	0.904											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	49.52	49.52	49.52	49.52
l_p,int, Pedestrian LOS Score for Intersection	2.813	2.919	3.207	3.182
Crosswalk LOS	C	C	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	517	517	800	683
d_b, Bicycle Delay [s]	33.02	33.02	21.61	26.02
l_b,int, Bicycle LOS Score for Intersection	2.212	2.489	3.712	3.105
Bicycle LOS	B	B	D	C

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 7: Pipeline Avenue at Woodview Road

Control Type:	Signalized	Delay (sec / veh):	20.1
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.613

Intersection Setup

Name	Pipeline Avenue		Pipeline Avenue		Woodview Road	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	40.00		30.00		35.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	No		No		No	
Crosswalk	Yes		No		Yes	

Volumes

Name	Pipeline Avenue		Pipeline Avenue		Woodview Road	
Base Volume Input [veh/h]	147	330	426	121	86	158
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00					
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	147	330	426	121	86	158
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	39	87	112	32	23	42
Total Analysis Volume [veh/h]	155	347	448	127	91	166
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0		0		0	
v_di, Inbound Pedestrian Volume crossing m	0		0		0	
v_co, Outbound Pedestrian Volume crossing	0		0		0	
v_ci, Inbound Pedestrian Volume crossing mi	0		0		0	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Protected	Permissive	Permissive	Permissive	Permissive	Permissive
Signal Group	1	6	2	0	3	0
Auxiliary Signal Groups						
Lead / Lag	Lead	-	-	-	Lead	-
Minimum Green [s]	6	6	6	0	6	0
Maximum Green [s]	30	30	30	0	30	0
Amber [s]	3.0	3.0	3.0	0.0	3.0	0.0
All red [s]	1.0	1.0	1.0	0.0	1.0	0.0
Split [s]	31	49	18	0	41	0
Vehicle Extension [s]	3.0	3.0	3.0	0.0	3.0	0.0
Walk [s]	0	0	7	0	7	0
Pedestrian Clearance [s]	0	0	7	0	11	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No	No		No	
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	2.0	0.0	2.0	0.0
Minimum Recall	No	No	No		No	
Maximum Recall	No	No	No		No	
Pedestrian Recall	No	No	No		No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	C
C, Cycle Length [s]	90	90	90	90
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	10	67	53	15
g / C, Green / Cycle	0.11	0.74	0.59	0.17
(v / s)_i Volume / Saturation Flow Rate	0.09	0.18	0.30	0.14
s, saturation flow rate [veh/h]	1800	1900	1900	1800
c, Capacity [veh/h]	194	1412	1123	302
d1, Uniform Delay [s]	39.21	3.63	10.80	36.36
k, delay calibration	0.11	0.50	0.50	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	7.35	0.41	1.67	6.63
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.80	0.25	0.51	0.85
d, Delay for Lane Group [s/veh]	46.57	4.05	12.47	42.99
Lane Group LOS	D	A	B	D
Critical Lane Group	Yes	No	Yes	Yes
50th-Percentile Queue Length [veh/ln]	3.62	1.47	6.57	5.86
50th-Percentile Queue Length [ft/ln]	90.39	36.76	164.17	146.59
95th-Percentile Queue Length [veh/ln]	6.51	2.65	10.77	9.84
95th-Percentile Queue Length [ft/ln]	162.70	66.16	269.24	245.88

Movement, Approach, & Intersection Results

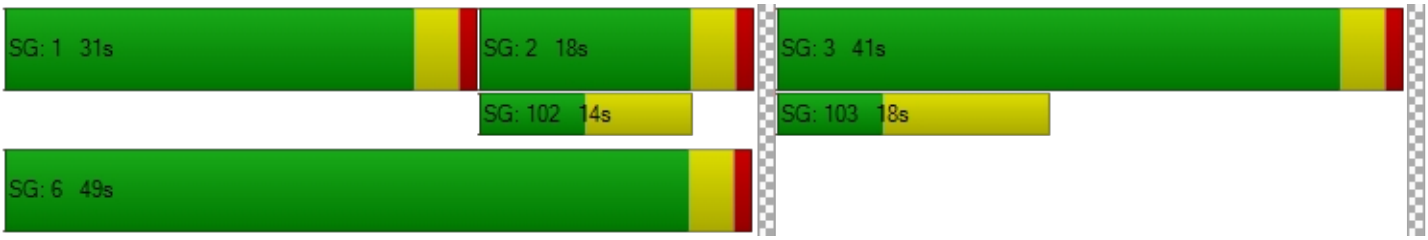
d_M, Delay for Movement [s/veh]	46.57	4.05	12.47	12.47	42.99	42.99
Movement LOS	D	A	B	B	D	D
d_A, Approach Delay [s/veh]	17.18		12.47		42.99	
Approach LOS	B		B		D	
d_I, Intersection Delay [s/veh]	20.12					
Intersection LOS	C					
Intersection V/C	0.613					

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	0.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	34.68	0.00	34.68
l_p,int, Pedestrian LOS Score for Intersection	2.423	0.000	2.021
Crosswalk LOS	B	F	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	1000	311	822
d_b, Bicycle Delay [s]	11.26	32.10	15.62
l_b,int, Bicycle LOS Score for Intersection	2.388	2.508	1.984
Bicycle LOS	B	B	A

Sequence

Ring 1	1	2	3	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 8: Pipeline Avenue at Soquel Canyon Parkway

Control Type:	Signalized	Delay (sec / veh):	18.0
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.575

Intersection Setup

Name	Pipeline Avenue		Soquel Canyon Parkway		Soquel Canyon Parkway	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	1	0	0	1
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	40.00		45.00		50.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	No		No		No	
Crosswalk	Yes		Yes		No	

Volumes

Name	Pipeline Avenue		Soquel Canyon Parkway		Soquel Canyon Parkway	
Base Volume Input [veh/h]	431	43	28	251	240	446
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00					
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	431	43	28	251	240	446
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	113	11	7	66	63	117
Total Analysis Volume [veh/h]	454	45	29	264	253	469
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0		0		0	
v_di, Inbound Pedestrian Volume crossing m	0		0		0	
v_co, Outbound Pedestrian Volume crossing	0		0		0	
v_ci, Inbound Pedestrian Volume crossing mi	0		0		0	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive
Signal Group	7	0	0	2	6	0
Auxiliary Signal Groups						
Lead / Lag	Lead	-	-	-	-	-
Minimum Green [s]	6	0	0	6	6	0
Maximum Green [s]	30	0	0	30	30	0
Amber [s]	3.0	0.0	0.0	3.0	3.0	0.0
All red [s]	1.0	0.0	0.0	1.0	1.0	0.0
Split [s]	67	0	0	23	23	0
Vehicle Extension [s]	3.0	0.0	0.0	3.0	3.0	0.0
Walk [s]	7	0	0	0	7	0
Pedestrian Clearance [s]	21	0	0	0	7	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk	No			No	No	
I1, Start-Up Lost Time [s]	2.0	0.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	0.0	0.0	2.0	2.0	0.0
Minimum Recall	No			No	No	
Maximum Recall	No			No	No	
Pedestrian Recall	No			No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	L	C	C	R
C, Cycle Length [s]	90	90	90	90	90
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	2.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	27	55	55	55	55
g / C, Green / Cycle	0.30	0.61	0.61	0.61	0.61
(v / s)_i Volume / Saturation Flow Rate	0.28	0.02	0.05	0.07	0.25
s, saturation flow rate [veh/h]	1800	1800	5700	3800	1900
c, Capacity [veh/h]	544	1078	3469	2313	1156
d1, Uniform Delay [s]	30.25	6.99	7.21	7.37	9.14
k, delay calibration	0.11	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	6.69	0.05	0.04	0.10	1.06
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.92	0.03	0.08	0.11	0.41
d, Delay for Lane Group [s/veh]	36.93	7.04	7.26	7.47	10.19
Lane Group LOS	D	A	A	A	B
Critical Lane Group	Yes	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	10.73	0.20	0.59	0.84	4.07
50th-Percentile Queue Length [ft/ln]	268.15	4.93	14.70	21.08	101.85
95th-Percentile Queue Length [veh/ln]	16.10	0.36	1.06	1.52	7.33
95th-Percentile Queue Length [ft/ln]	402.42	8.88	26.46	37.95	183.33

Movement, Approach, & Intersection Results

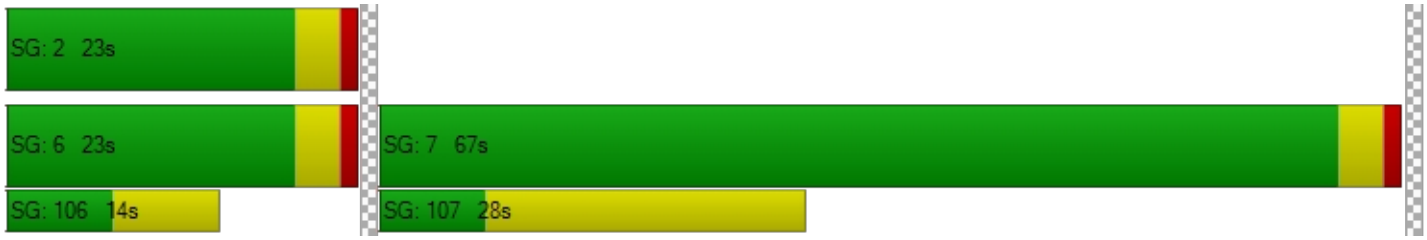
d_M, Delay for Movement [s/veh]	36.93	36.93	7.04	7.26	7.47	10.19
Movement LOS	D	D	A	A	A	B
d_A, Approach Delay [s/veh]	36.93		7.24		9.24	
Approach LOS	D		A		A	
d_I, Intersection Delay [s/veh]	17.98					
Intersection LOS	B					
Intersection V/C	0.575					

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	34.63	34.63	0.00
I_p,int, Pedestrian LOS Score for Intersection	2.404	2.596	0.000
Crosswalk LOS	B	B	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	1401	423	423
d_b, Bicycle Delay [s]	4.03	27.96	27.96
I_b,int, Bicycle LOS Score for Intersection	2.383	1.721	2.155
Bicycle LOS	B	A	B

Sequence

Ring 1	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	7	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



APPENDIX F-IV

CARBON CAYON ROAD SENSITIVITY ASSESSMENT

APPENDIX F-X

EXISTING WITH PROJECT

Intersection Level Of Service Report
Intersection 12: Carbon Canyon Road at Fairway Drive/Ginseng Lane

Control Type:	Signalized	Delay (sec / veh):	9.9
Analysis Method:	HCM 7th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.856

Intersection Setup

Name	Carbon Canyon Road			Carbon Canyon Road			Fairway Drive			Ginseng Lane		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	0	0	0	1	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	45.00			45.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			No		

Volumes

Name	Carbon Canyon Road			Carbon Canyon Road			Fairway Drive			Ginseng Lane		
Base Volume Input [veh/h]	21	384	0	1	1336	24	33	0	28	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	21	384	0	1	1336	24	33	0	28	0	0	0
Peak Hour Factor	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	6	102	0	0	355	6	9	0	7	0	0	0
Total Analysis Volume [veh/h]	22	409	0	1	1421	26	35	0	30	0	0	0
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	6	0	0	2	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	6	0	0	6	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	98	0	0	98	0	0	22	0	0	22	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	0	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	14	0	0	11	0	0	11	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	L	C	C	R	C
C, Cycle Length [s]	120	120	120	120	120	120	120
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	2.00	0.00	2.00	0.00	2.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	107	107	107	107	5	5	5
g / C, Green / Cycle	0.89	0.89	0.89	0.89	0.04	0.04	0.04
(v / s)_i Volume / Saturation Flow Rate	0.06	0.22	0.00	0.78	0.02	0.02	0.00
s, saturation flow rate [veh/h]	368	1870	976	1864	1542	1589	1533
c, Capacity [veh/h]	234	1662	876	1657	129	71	98
d1, Uniform Delay [s]	17.78	0.95	1.63	3.32	55.83	55.77	0.00
k, delay calibration	0.50	0.50	0.50	0.50	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.80	0.35	0.00	6.71	1.12	3.96	0.00
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.09	0.25	0.00	0.87	0.27	0.42	0.00
d, Delay for Lane Group [s/veh]	18.58	1.30	1.63	10.03	56.95	59.73	0.00
Lane Group LOS	B	A	A	B	E	E	A
Critical Lane Group	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	0.38	0.24	0.00	3.98	1.08	0.97	0.00
50th-Percentile Queue Length [ft/ln]	9.49	5.88	0.06	99.52	27.07	24.26	0.00
95th-Percentile Queue Length [veh/ln]	0.68	0.42	0.00	7.17	1.95	1.75	0.00
95th-Percentile Queue Length [ft/ln]	17.09	10.59	0.11	179.13	48.72	43.66	0.00

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	18.58	1.30	1.30	1.63	10.03	10.03	56.95	56.95	59.73	0.00	0.00	0.00
Movement LOS	B	A	A	A	B	B	E	E	E	A	A	A
d_A, Approach Delay [s/veh]	2.19			10.03			58.23			0.00		
Approach LOS	A			B			E			A		
d_I, Intersection Delay [s/veh]	9.90											
Intersection LOS	A											
Intersection V/C	0.856											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	0.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	49.48	49.48	49.48	0.00
l_p,int, Pedestrian LOS Score for Intersection	2.871	2.926	2.016	0.000
Crosswalk LOS	C	C	B	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	1567	1567	300	300
d_b, Bicycle Delay [s]	2.81	2.81	43.33	43.33
l_b,int, Bicycle LOS Score for Intersection	2.271	3.949	1.667	1.560
Bicycle LOS	B	D	A	A

Sequence

Ring 1	-	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 13: Carbon Canyon Road at Canyon Hills Road

Control Type:	Signalized	Delay (sec / veh):	10.1
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.798

Intersection Setup

Name	Carbon Canyon Road			Carbon Canyon Road			Canyon Hills Road			Canyon Hills Road		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	1	0	0	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	45.00			45.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			No		

Volumes

Name	Carbon Canyon Road			Carbon Canyon Road			Canyon Hills Road			Canyon Hills Road		
Base Volume Input [veh/h]	11	298	0	0	1333	22	34	0	31	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	11	298	0	0	1333	22	34	0	31	0	0	0
Peak Hour Factor	0.9610	0.9610	0.9610	0.9610	0.9610	0.9610	0.9610	0.9610	0.9610	0.9610	0.9610	0.9610
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	78	0	0	347	6	9	0	8	0	0	0
Total Analysis Volume [veh/h]	11	310	0	0	1387	23	35	0	32	0	0	0
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	6	0	0	2	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	6	0	0	6	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	91	0	0	91	0	0	29	0	0	29	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	0	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	21	0	0	18	0	0	11	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	L	C	C	C
C, Cycle Length [s]	120	120	120	120	120	120
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	2.00	0.00	2.00	2.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	106	106	106	106	6	6
g / C, Green / Cycle	0.88	0.88	0.88	0.88	0.05	0.05
(v / s)_i Volume / Saturation Flow Rate	0.03	0.17	0.00	0.76	0.04	0.00
s, saturation flow rate [veh/h]	381	1870	1069	1865	1584	1311
c, Capacity [veh/h]	244	1647	953	1642	129	99
d1, Uniform Delay [s]	16.57	1.03	0.00	3.51	56.02	0.00
k, delay calibration	0.50	0.50	0.50	0.50	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.35	0.25	0.00	6.09	3.19	0.00
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.05	0.19	0.00	0.86	0.52	0.00
d, Delay for Lane Group [s/veh]	16.92	1.28	0.00	9.60	59.21	0.00
Lane Group LOS	B	A	A	A	E	A
Critical Lane Group	No	No	No	Yes	Yes	No
50th-Percentile Queue Length [veh/ln]	0.18	0.27	0.00	5.13	2.14	0.00
50th-Percentile Queue Length [ft/ln]	4.46	6.68	0.00	128.20	53.38	0.00
95th-Percentile Queue Length [veh/ln]	0.32	0.48	0.00	8.84	3.84	0.00
95th-Percentile Queue Length [ft/ln]	8.04	12.02	0.00	221.04	96.08	0.00

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	16.92	1.28	1.28	0.00	9.60	9.60	59.21	59.21	59.21	0.00	0.00	0.00
Movement LOS	B	A	A	A	A	A	E	E	E	A	A	A
d_A, Approach Delay [s/veh]	1.82			9.60			59.21			0.00		
Approach LOS	A			A			E			A		
d_I, Intersection Delay [s/veh]	10.06											
Intersection LOS	B											
Intersection V/C	0.798											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	0.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	49.48	49.48	49.48	0.00
l_p,int, Pedestrian LOS Score for Intersection	2.802	2.859	1.785	0.000
Crosswalk LOS	C	C	A	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	1451	1451	417	417
d_b, Bicycle Delay [s]	4.53	4.53	37.58	37.58
l_b,int, Bicycle LOS Score for Intersection	2.089	3.886	1.670	1.560
Bicycle LOS	B	D	A	A

Sequence

Ring 1	-	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 12: Carbon Canyon Road at Fairway Drive/Ginseng Lane

Control Type:	Two-way stop	Delay (sec / veh):	35.4
Analysis Method:	HCM 7th Edition	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.229

Intersection Setup

Name	Carbon Canyon Road			Carbon Canyon Road			Fairway Drive			Ginseng Lane		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	0	0	0	1	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	45.00			45.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			No			No		

Volumes

Name	Carbon Canyon Road			Carbon Canyon Road			Fairway Drive			Ginseng Lane		
Base Volume Input [veh/h]	21	384	0	1	1336	24	33	0	28	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	21	384	0	1	1336	24	33	0	28	0	0	0
Peak Hour Factor	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	6	102	0	0	355	6	9	0	7	0	0	0
Total Analysis Volume [veh/h]	22	409	0	1	1421	26	35	0	30	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Free	Free	Stop	Stop
Flared Lane				No
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance			Yes	Yes
Number of Storage Spaces in Median	0	0	2	2

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.05	0.00	0.00	0.00	0.01	0.00	0.23	0.00	0.18	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	13.07	0.00	0.00	8.13	0.00	0.00	35.42	31.71	31.77	39.62	27.39	10.60
Movement LOS	B	A	A	A	A	A	E	D	D	E	D	B
95th-Percentile Queue Length [veh/ln]	0.15	0.00	0.00	0.00	0.00	0.00	0.84	0.84	0.65	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	3.69	0.00	0.00	0.07	0.00	0.00	21.08	21.08	16.15	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	0.67			0.01			33.74			25.87		
Approach LOS	A			A			D			D		
d_I, Intersection Delay [s/veh]	1.28											
Intersection LOS	E											

Intersection Level Of Service Report
Intersection 13: Carbon Canyon Road at Canyon Hills Road

Control Type:	Two-way stop	Delay (sec / veh):	35.7
Analysis Method:	HCM 7th Edition	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.186

Intersection Setup

Name	Carbon Canyon Road		Carbon Canyon Road		Canyon Hills Road	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	1	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	45.00		45.00		25.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name	Carbon Canyon Road		Carbon Canyon Road		Canyon Hills Road	
Base Volume Input [veh/h]	11	298	1333	22	34	31
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	11	298	1333	22	34	31
Peak Hour Factor	0.9610	0.9610	0.9610	0.9610	0.9610	0.9610
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	78	347	6	9	8
Total Analysis Volume [veh/h]	11	310	1387	23	35	32
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			Yes
Number of Storage Spaces in Median	0	0	2

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.00	0.01	0.00	0.16	0.19
d_M, Delay for Movement [s/veh]	12.62	0.00	0.00	0.00	31.81	35.74
Movement LOS	B	A	A	A	D	E
95th-Percentile Queue Length [veh/ln]	0.07	0.00	0.00	0.00	1.48	1.48
95th-Percentile Queue Length [ft/ln]	1.74	0.00	0.00	0.00	36.98	36.98
d_A, Approach Delay [s/veh]	0.43		0.00		33.68	
Approach LOS	A		A		D	
d_I, Intersection Delay [s/veh]	1.33					
Intersection LOS	E					

Intersection Level Of Service Report
Intersection 12: Carbon Canyon Road at Fairway Drive/Ginseng Lane

Control Type:	Roundabout	Delay (sec / veh):	407.0
Analysis Method:	HCM 7th Edition	Level Of Service:	F
Analysis Period:	15 minutes		

Intersection Setup

Name	Carbon Canyon Road			Carbon Canyon Road			Fairway Drive			Ginseng Lane		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	45.00			45.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			No			No		

Volumes

Name	Carbon Canyon Road			Carbon Canyon Road			Fairway Drive			Ginseng Lane		
Base Volume Input [veh/h]	21	384	405	1	1336	1361	33	0	61	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	21	384	405	1	1336	1361	33	0	61	0	0	0
Peak Hour Factor	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	6	102	108	0	355	362	9	0	16	0	0	0
Total Analysis Volume [veh/h]	22	409	431	1	1421	1448	35	0	65	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Number of Conflicting Circulating Lanes	1			1			1			1		
Circulating Flow Rate [veh/h]	37			22			1450			475		
Exiting Flow Rate [veh/h]	1516			453			1499			441		
Demand Flow Rate [veh/h]	21	384	405	1	1336	1361	33	0	61	0	0	0
Adjusted Demand Flow Rate [veh/h]	22	409	431	1	1421	1448	35	0	65	0	0	0

Lanes

Overwrite Calculated Critical Headway	No	No	No	No
User-Defined Critical Headway [s]	4.00	4.00	4.00	4.00
Overwrite Calculated Follow-Up Time	No	No	No	No
User-Defined Follow-Up Time [s]	3.00	3.00	3.00	3.00
A (intercept)	1380.00	1380.00	1380.00	1380.00
B (coefficient)	0.00102	0.00102	0.00102	0.00102
HV Adjustment Factor	0.98	0.98	0.98	0.98
Entry Flow Rate [veh/h]	880	2928	102	0
Capacity of Entry and Bypass Lanes [veh/h]	1330	1349	315	850
Pedestrian Impedance	1.00	1.00	1.00	1.00
Capacity per Entry Lane [veh/h]	1304	1323	309	834
X, volume / capacity	0.66	2.17	0.32	0.00

Movement, Approach, & Intersection Results

Lane LOS	B	F	C	A
95th-Percentile Queue Length [veh]	5.34	198.87	1.37	0.00
95th-Percentile Queue Length [ft]	133.59	4971.78	34.23	0.00
Approach Delay [s/veh]	11.29	539.41	18.82	4.32
Approach LOS	B	F	C	A
Intersection Delay [s/veh]	407.03			
Intersection LOS	F			

Intersection Level Of Service Report
Intersection 13: Carbon Canyon Road at Canyon Hills Road

Control Type:	Roundabout	Delay (sec / veh):	437.0
Analysis Method:	HCM 7th Edition	Level Of Service:	F
Analysis Period:	15 minutes		

Intersection Setup

Name	Carbon Canyon Road		Carbon Canyon Road		Canyon Hills Road	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	45.00		45.00		25.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name	Carbon Canyon Road		Carbon Canyon Road		Canyon Hills Road	
Base Volume Input [veh/h]	11	309	1333	1355	34	65
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00					
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	11	309	1333	1355	34	65
Peak Hour Factor	0.9610	0.9610	0.9610	0.9610	0.9610	0.9610
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	80	347	352	9	17
Total Analysis Volume [veh/h]	11	322	1387	1410	35	68
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Number of Conflicting Circulating Lanes	1		1		1	
Circulating Flow Rate [veh/h]	36		11		1415	
Exiting Flow Rate [veh/h]	1484		364		1449	
Demand Flow Rate [veh/h]	11	309	1333	1355	34	65
Adjusted Demand Flow Rate [veh/h]	11	322	1387	1410	35	68

Lanes

Overwrite Calculated Critical Headway	No	No	No
User-Defined Critical Headway [s]	4.00	4.00	4.00
Overwrite Calculated Follow-Up Time	No	No	No
User-Defined Follow-Up Time [s]	3.00	3.00	3.00
A (intercept)	1380.00	1380.00	1380.00
B (coefficient)	0.00102	0.00102	0.00102
HV Adjustment Factor	0.98	0.98	0.98
Entry Flow Rate [veh/h]	340	2853	106
Capacity of Entry and Bypass Lanes [veh/h]	1331	1365	326
Pedestrian Impedance	1.00	1.00	1.00
Capacity per Entry Lane [veh/h]	1305	1338	320
X, volume / capacity	0.26	2.09	0.32

Movement, Approach, & Intersection Results

Lane LOS	A	F	C
95th-Percentile Queue Length [veh]	1.02	188.01	1.36
95th-Percentile Queue Length [ft]	25.49	4700.26	33.96
Approach Delay [s/veh]	4.98	503.81	18.14
Approach LOS	A	F	C
Intersection Delay [s/veh]	436.96		
Intersection LOS	F		

Intersection Level Of Service Report
Intersection 12: Carbon Canyon Road at Fairway Drive/Ginseng Lane

Control Type:	Signalized	Delay (sec / veh):	7.3
Analysis Method:	HCM 7th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.809

Intersection Setup

Name	Carbon Canyon Road			Carbon Canyon Road			Fairway Drive			Ginseng Lane		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	0	0	0	1	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	45.00			45.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			No		

Volumes

Name	Carbon Canyon Road			Carbon Canyon Road			Fairway Drive			Ginseng Lane		
Base Volume Input [veh/h]	27	1334	4	8	480	36	31	0	25	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	27	1334	4	8	480	36	31	0	25	0	0	0
Peak Hour Factor	0.9750	0.9750	0.9750	0.9750	0.9750	0.9750	0.9750	0.9750	0.9750	0.9750	0.9750	0.9750
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	7	342	1	2	123	9	8	0	6	0	0	0
Total Analysis Volume [veh/h]	28	1368	4	8	492	37	32	0	26	0	0	0
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	6	0	0	2	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	6	0	0	6	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	98	0	0	98	0	0	22	0	0	22	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	0	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	14	0	0	11	0	0	11	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	L	C	C	R	C
C, Cycle Length [s]	120	120	120	120	120	120	120
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	2.00	0.00	2.00	0.00	2.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	107	107	107	107	5	5	5
g / C, Green / Cycle	0.89	0.89	0.89	0.89	0.04	0.04	0.04
(v / s)_i Volume / Saturation Flow Rate	0.03	0.73	0.02	0.29	0.02	0.02	0.00
s, saturation flow rate [veh/h]	874	1869	396	1847	1547	1589	1545
c, Capacity [veh/h]	780	1664	281	1644	127	69	97
d1, Uniform Delay [s]	1.92	2.72	11.97	1.01	55.90	55.80	0.00
k, delay calibration	0.50	0.50	0.50	0.50	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.09	4.80	0.19	0.52	1.03	3.43	0.00
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.04	0.82	0.03	0.32	0.25	0.38	0.00
d, Delay for Lane Group [s/veh]	2.01	7.52	12.16	1.53	56.93	59.23	0.00
Lane Group LOS	A	A	B	A	E	E	A
Critical Lane Group	No	Yes	No	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	0.09	2.67	0.11	0.30	0.99	0.84	0.00
50th-Percentile Queue Length [ft/ln]	2.13	66.71	2.64	7.54	24.73	20.95	0.00
95th-Percentile Queue Length [veh/ln]	0.15	4.80	0.19	0.54	1.78	1.51	0.00
95th-Percentile Queue Length [ft/ln]	3.83	120.08	4.76	13.58	44.51	37.71	0.00

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	2.01	7.52	7.52	12.16	1.53	1.53	56.93	56.93	59.23	0.00	0.00	0.00
Movement LOS	A	A	A	B	A	A	E	E	E	A	A	A
d_A, Approach Delay [s/veh]	7.41			1.69			57.96			0.00		
Approach LOS	A			A			E			A		
d_I, Intersection Delay [s/veh]	7.34											
Intersection LOS	A											
Intersection V/C	0.809											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	0.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	49.48	49.48	49.48	0.00
l_p,int, Pedestrian LOS Score for Intersection	2.889	2.944	2.027	0.000
Crosswalk LOS	C	C	B	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	1567	1567	300	300
d_b, Bicycle Delay [s]	2.81	2.81	43.33	43.33
l_b,int, Bicycle LOS Score for Intersection	3.870	2.446	1.655	1.560
Bicycle LOS	D	B	A	A

Sequence

Ring 1	-	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 13: Carbon Canyon Road at Canyon Hills Road

Control Type:	Signalized	Delay (sec / veh):	7.5
Analysis Method:	HCM 7th Edition	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.777

Intersection Setup

Name	Carbon Canyon Road			Carbon Canyon Road			Canyon Hills Road			Canyon Hills Road		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	1	0	0	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	45.00			45.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			No		

Volumes

Name	Carbon Canyon Road			Carbon Canyon Road			Canyon Hills Road			Canyon Hills Road		
Base Volume Input [veh/h]	11	1351	0	0	415	36	24	0	20	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	11	1351	0	0	415	36	24	0	20	0	0	0
Peak Hour Factor	0.9650	0.9650	0.9650	0.9650	0.9650	0.9650	0.9650	0.9650	0.9650	0.9650	0.9650	0.9650
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	350	0	0	108	9	6	0	5	0	0	0
Total Analysis Volume [veh/h]	11	1400	0	0	430	37	25	0	21	0	0	0
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	6	0	0	2	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	6	0	0	6	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	91	0	0	91	0	0	29	0	0	29	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	0	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	21	0	0	18	0	0	11	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	L	C	C	C
C, Cycle Length [s]	120	120	120	120	120	120
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	2.00	0.00	2.00	2.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	107	107	107	107	5	5
g / C, Green / Cycle	0.89	0.89	0.89	0.89	0.04	0.04
(v / s)_i Volume / Saturation Flow Rate	0.01	0.75	0.00	0.25	0.03	0.00
s, saturation flow rate [veh/h]	926	1870	385	1844	1615	1129
c, Capacity [veh/h]	833	1671	271	1648	110	75
d1, Uniform Delay [s]	1.64	2.69	0.00	0.91	56.79	0.00
k, delay calibration	0.50	0.50	0.50	0.50	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.03	5.19	0.00	0.43	2.50	0.00
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.01	0.84	0.00	0.28	0.42	0.00
d, Delay for Lane Group [s/veh]	1.67	7.88	0.00	1.34	59.30	0.00
Lane Group LOS	A	A	A	A	E	A
Critical Lane Group	No	Yes	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.03	2.41	0.00	0.20	1.46	0.00
50th-Percentile Queue Length [ft/ln]	0.71	60.23	0.00	4.94	36.61	0.00
95th-Percentile Queue Length [veh/ln]	0.05	4.34	0.00	0.36	2.64	0.00
95th-Percentile Queue Length [ft/ln]	1.28	108.42	0.00	8.88	65.90	0.00

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	1.67	7.88	7.88	0.00	1.34	1.34	59.30	59.30	59.30	0.00	0.00	0.00
Movement LOS	A	A	A	A	A	A	E	E	E	A	A	A
d_A, Approach Delay [s/veh]	7.83			1.34			59.30			0.00		
Approach LOS	A			A			E			A		
d_I, Intersection Delay [s/veh]	7.49											
Intersection LOS	A											
Intersection V/C	0.777											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	0.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	49.48	49.48	49.48	0.00
l_p,int, Pedestrian LOS Score for Intersection	2.862	2.912	1.782	0.000
Crosswalk LOS	C	C	A	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	1451	1451	417	417
d_b, Bicycle Delay [s]	4.53	4.53	37.58	37.58
l_b,int, Bicycle LOS Score for Intersection	3.888	2.330	1.636	1.560
Bicycle LOS	D	B	A	A

Sequence

Ring 1	-	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 12: Carbon Canyon Road at Fairway Drive/Ginseng Lane

Control Type:	Two-way stop	Delay (sec / veh):	37.3
Analysis Method:	HCM 7th Edition	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.224

Intersection Setup

Name	Carbon Canyon Road			Carbon Canyon Road			Fairway Drive			Ginseng Lane		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	0	0	0	1	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	45.00			45.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			No			No		

Volumes

Name	Carbon Canyon Road			Carbon Canyon Road			Fairway Drive			Ginseng Lane		
Base Volume Input [veh/h]	27	1334	4	8	480	36	31	0	25	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	27	1334	4	8	480	36	31	0	25	0	0	0
Peak Hour Factor	0.9750	0.9750	0.9750	0.9750	0.9750	0.9750	0.9750	0.9750	0.9750	0.9750	0.9750	0.9750
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	7	342	1	2	123	9	8	0	6	0	0	0
Total Analysis Volume [veh/h]	28	1368	4	8	492	37	32	0	26	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Free	Free	Stop	Stop
Flared Lane				No
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance			Yes	Yes
Number of Storage Spaces in Median	0	0	2	2

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.03	0.01	0.00	0.02	0.00	0.00	0.22	0.00	0.05	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	8.56	0.00	0.00	12.31	0.00	0.00	37.31	33.23	11.70	29.33	25.47	25.10
Movement LOS	A	A	A	B	A	A	E	D	B	D	D	D
95th-Percentile Queue Length [veh/ln]	0.08	0.00	0.00	0.05	0.00	0.00	0.82	0.82	0.14	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	2.08	0.00	0.00	1.22	0.00	0.00	20.43	20.43	3.62	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	0.17			0.18			25.83			26.63		
Approach LOS	A			A			D			D		
d_I, Intersection Delay [s/veh]	0.92											
Intersection LOS	E											

Intersection Level Of Service Report
Intersection 13: Carbon Canyon Road at Canyon Hills Road

Control Type:	Two-way stop	Delay (sec / veh):	25.1
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.123

Intersection Setup

Name	Carbon Canyon Road		Carbon Canyon Road		Canyon Hills Road	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	1	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	45.00		45.00		25.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name	Carbon Canyon Road		Carbon Canyon Road		Canyon Hills Road	
Base Volume Input [veh/h]	11	1351	415	36	24	20
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	11	1351	415	36	24	20
Peak Hour Factor	0.9650	0.9650	0.9650	0.9650	0.9650	0.9650
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	350	108	9	6	5
Total Analysis Volume [veh/h]	11	1400	430	37	25	21
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			Yes
Number of Storage Spaces in Median	0	0	2

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.01	0.00	0.00	0.12	0.03
d_M, Delay for Movement [s/veh]	8.32	0.00	0.00	0.00	25.06	13.20
Movement LOS	A	A	A	A	D	B
95th-Percentile Queue Length [veh/ln]	0.03	0.00	0.00	0.00	0.55	0.55
95th-Percentile Queue Length [ft/ln]	0.76	0.00	0.00	0.00	13.80	13.80
d_A, Approach Delay [s/veh]	0.06		0.00		19.64	
Approach LOS	A		A		C	
d_I, Intersection Delay [s/veh]	0.52					
Intersection LOS	D					

Intersection Level Of Service Report
Intersection 12: Carbon Canyon Road at Fairway Drive/Ginseng Lane

Control Type:	Roundabout	Delay (sec / veh):	383.9
Analysis Method:	HCM 7th Edition	Level Of Service:	F
Analysis Period:	15 minutes		

Intersection Setup

Name	Carbon Canyon Road			Carbon Canyon Road			Fairway Drive			Ginseng Lane		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	45.00			45.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			No			No		

Volumes

Name	Carbon Canyon Road			Carbon Canyon Road			Fairway Drive			Ginseng Lane		
Base Volume Input [veh/h]	27	1334	1365	8	480	524	31	0	56	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	27	1334	1365	8	480	524	31	0	56	0	0	0
Peak Hour Factor	0.9750	0.9750	0.9750	0.9750	0.9750	0.9750	0.9750	0.9750	0.9750	0.9750	0.9750	0.9750
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	7	342	350	2	123	134	8	0	14	0	0	0
Total Analysis Volume [veh/h]	28	1368	1400	8	492	537	32	0	57	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Number of Conflicting Circulating Lanes	1			1			1			1		
Circulating Flow Rate [veh/h]	41			29			510			1457		
Exiting Flow Rate [veh/h]	560			1428			576			1436		
Demand Flow Rate [veh/h]	27	1334	1365	8	480	524	31	0	56	0	0	0
Adjusted Demand Flow Rate [veh/h]	28	1368	1400	8	492	537	32	0	57	0	0	0

Lanes

Overwrite Calculated Critical Headway	No	No	No	No
User-Defined Critical Headway [s]	4.00	4.00	4.00	4.00
Overwrite Calculated Follow-Up Time	No	No	No	No
User-Defined Follow-Up Time [s]	3.00	3.00	3.00	3.00
A (intercept)	1380.00	1380.00	1380.00	1380.00
B (coefficient)	0.00102	0.00102	0.00102	0.00102
HV Adjustment Factor	0.98	0.98	0.98	0.98
Entry Flow Rate [veh/h]	2852	1058	91	0
Capacity of Entry and Bypass Lanes [veh/h]	1324	1341	821	313
Pedestrian Impedance	1.00	1.00	1.00	1.00
Capacity per Entry Lane [veh/h]	1298	1315	805	307
X, volume / capacity	2.15	0.79	0.11	0.00

Movement, Approach, & Intersection Results

Lane LOS	F	C	A	B
95th-Percentile Queue Length [veh]	192.72	8.93	0.37	0.00
95th-Percentile Queue Length [ft]	4817.91	223.16	9.29	0.00
Approach Delay [s/veh]	532.39	16.02	5.59	11.76
Approach LOS	F	C	A	B
Intersection Delay [s/veh]	383.91			
Intersection LOS	F			

Intersection Level Of Service Report
Intersection 13: Carbon Canyon Road at Canyon Hills Road

Control Type:	Roundabout	Delay (sec / veh):	43.6
Analysis Method:	HCM 7th Edition	Level Of Service:	E
Analysis Period:	15 minutes		

Intersection Setup

Name	Carbon Canyon Road		Carbon Canyon Road		Canyon Hills Road	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	45.00		45.00		25.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name	Carbon Canyon Road		Carbon Canyon Road		Canyon Hills Road	
Base Volume Input [veh/h]	11	1362	415	451	24	44
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00					
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	11	1362	415	451	24	44
Peak Hour Factor	0.9650	0.9650	0.9650	0.9650	0.9650	0.9650
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	353	108	117	6	11
Total Analysis Volume [veh/h]	11	1411	430	467	25	46
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Number of Conflicting Circulating Lanes	1		1		1	
Circulating Flow Rate [veh/h]	26		11		439	
Exiting Flow Rate [veh/h]	486		1465		488	
Demand Flow Rate [veh/h]	11	1362	415	451	24	44
Adjusted Demand Flow Rate [veh/h]	11	1411	430	467	25	46

Lanes

Overwrite Calculated Critical Headway	No	No	No
User-Defined Critical Headway [s]	4.00	4.00	4.00
Overwrite Calculated Follow-Up Time	No	No	No
User-Defined Follow-Up Time [s]	3.00	3.00	3.00
A (intercept)	1380.00	1380.00	1380.00
B (coefficient)	0.00102	0.00102	0.00102
HV Adjustment Factor	0.98	0.98	0.98
Entry Flow Rate [veh/h]	1451	915	73
Capacity of Entry and Bypass Lanes [veh/h]	1345	1365	883
Pedestrian Impedance	1.00	1.00	1.00
Capacity per Entry Lane [veh/h]	1319	1338	865
X, volume / capacity	1.08	0.67	0.08

Movement, Approach, & Intersection Results

Lane LOS	F	B	A
95th-Percentile Queue Length [veh]	30.47	5.55	0.27
95th-Percentile Queue Length [ft]	761.83	138.73	6.69
Approach Delay [s/veh]	65.94	11.34	4.94
Approach LOS	F	B	A
Intersection Delay [s/veh]	43.63		
Intersection LOS	E		

APPENDIX F-X

2029 WITH PROJECT

Intersection Level Of Service Report
Intersection 12: Carbon Canyon Road at Fairway Drive/Ginseng Lane

Control Type:	Signalized	Delay (sec / veh):	25.3
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.986

Intersection Setup

Name	Carbon Canyon Road			Carbon Canyon Road			Fairway Drive			Ginseng Lane		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	0	0	0	1	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	45.00			45.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			No		

Volumes

Name	Carbon Canyon Road			Carbon Canyon Road			Fairway Drive			Ginseng Lane		
Base Volume Input [veh/h]	23	524	0	1	1564	26	33	0	28	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	23	524	0	1	1564	26	33	0	28	0	0	0
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	6	138	0	0	412	7	9	0	7	0	0	0
Total Analysis Volume [veh/h]	24	552	0	1	1646	27	35	0	29	0	0	0
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	6	0	0	2	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	6	0	0	6	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	98	0	0	98	0	0	22	0	0	22	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	0	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	14	0	0	11	0	0	11	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	L	C	C	R	C
C, Cycle Length [s]	120	120	120	120	120	120	120
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	2.00	0.00	2.00	0.00	2.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	107	107	107	107	5	5	5
g / C, Green / Cycle	0.89	0.89	0.89	0.89	0.04	0.04	0.04
(v / s)_i Volume / Saturation Flow Rate	0.08	0.30	0.00	0.90	0.02	0.02	0.00
s, saturation flow rate [veh/h]	296	1870	856	1865	1543	1589	1523
c, Capacity [veh/h]	60	1662	762	1657	129	71	98
d1, Uniform Delay [s]	59.95	1.05	1.95	6.66	55.85	55.76	0.00
k, delay calibration	0.50	0.50	0.50	0.50	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	18.33	0.54	0.00	24.43	1.13	3.78	0.00
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.40	0.33	0.00	1.01	0.27	0.41	0.00
d, Delay for Lane Group [s/veh]	78.28	1.59	1.95	31.09	56.98	59.54	0.00
Lane Group LOS	E	A	A	F	E	E	A
Critical Lane Group	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	1.02	0.35	0.00	13.21	1.08	0.94	0.00
50th-Percentile Queue Length [ft/ln]	25.55	8.78	0.08	330.14	27.07	23.41	0.00
95th-Percentile Queue Length [veh/ln]	1.84	0.63	0.01	19.33	1.95	1.69	0.00
95th-Percentile Queue Length [ft/ln]	45.99	15.80	0.14	483.13	48.73	42.14	0.00

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	78.28	1.59	1.59	1.95	31.09	31.09	56.98	56.98	59.54	0.00	0.00	0.00
Movement LOS	E	A	A	A	C	C	E	E	E	A	A	A
d_A, Approach Delay [s/veh]	4.78			31.07			58.14			0.00		
Approach LOS	A			C			E			A		
d_I, Intersection Delay [s/veh]	25.28											
Intersection LOS	C											
Intersection V/C	0.986											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	0.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	49.48	49.48	49.48	0.00
l_p,int, Pedestrian LOS Score for Intersection	3.051	3.106	2.019	0.000
Crosswalk LOS	C	C	B	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	1567	1567	300	300
d_b, Bicycle Delay [s]	2.81	2.81	43.33	43.33
l_b,int, Bicycle LOS Score for Intersection	2.510	4.322	1.665	1.560
Bicycle LOS	B	E	A	A

Sequence

Ring 1	-	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 13: Carbon Canyon Road at Canyon Hills Road

Control Type:	Signalized	Delay (sec / veh):	36.3
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.956

Intersection Setup

Name	Carbon Canyon Road		Carbon Canyon Road		Canyon Hills Road	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	45.00		45.00		25.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	No		No		No	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	Carbon Canyon Road		Carbon Canyon Road		Canyon Hills Road	
Base Volume Input [veh/h]	16	412	1552	30	52	47
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00					
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	16	412	1552	30	52	47
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	4	108	408	8	14	12
Total Analysis Volume [veh/h]	17	434	1634	32	55	49
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0		0		0	
v_di, Inbound Pedestrian Volume crossing m	0		0		0	
v_co, Outbound Pedestrian Volume crossing	0		0		0	
v_ci, Inbound Pedestrian Volume crossing mi	0		0		0	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive
Signal Group	0	6	2	0	3	0
Auxiliary Signal Groups						
Lead / Lag	-	-	-	-	Lead	-
Minimum Green [s]	0	6	6	0	6	0
Maximum Green [s]	0	30	30	0	30	0
Amber [s]	0.0	3.0	3.0	0.0	3.0	0.0
All red [s]	0.0	1.0	1.0	0.0	1.0	0.0
Split [s]	0	99	99	0	21	0
Vehicle Extension [s]	0.0	3.0	3.0	0.0	3.0	0.0
Walk [s]	0	0	7	0	7	0
Pedestrian Clearance [s]	0	0	7	0	11	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No	No		No	
I1, Start-Up Lost Time [s]	0.0	2.0	2.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	2.0	0.0	2.0	0.0
Minimum Recall		No	No		No	
Maximum Recall		No	No		No	
Pedestrian Recall		No	No		No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	C
C, Cycle Length [s]	120	120	120	120
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	103	103	103	9
g / C, Green / Cycle	0.86	0.86	0.86	0.08
(v / s)_i Volume / Saturation Flow Rate	0.06	0.23	0.89	0.06
s, saturation flow rate [veh/h]	298	1870	1864	1685
c, Capacity [veh/h]	61	1603	1598	128
d1, Uniform Delay [s]	59.89	1.58	8.54	54.53
k, delay calibration	0.50	0.50	0.50	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	11.08	0.42	34.47	11.73
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.28	0.27	1.04	0.81
d, Delay for Lane Group [s/veh]	70.97	2.00	43.01	66.26
Lane Group LOS	E	A	F	E
Critical Lane Group	No	No	Yes	Yes
50th-Percentile Queue Length [veh/ln]	0.69	0.85	28.55	3.53
50th-Percentile Queue Length [ft/ln]	17.32	21.32	713.65	88.33
95th-Percentile Queue Length [veh/ln]	1.25	1.54	38.80	6.36
95th-Percentile Queue Length [ft/ln]	31.18	38.38	970.09	158.99

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	70.97	2.00	43.01	43.01	66.26	66.26
Movement LOS	E	A	F	D	E	E
d_A, Approach Delay [s/veh]	4.60		43.01		66.26	
Approach LOS	A		D		E	
d_I, Intersection Delay [s/veh]	36.30					
Intersection LOS	D					
Intersection V/C	0.956					

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	49.45	49.45	49.45
l_p,int, Pedestrian LOS Score for Intersection	2.994	3.304	1.815
Crosswalk LOS	C	C	A
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	1585	1585	284
d_b, Bicycle Delay [s]	2.59	2.59	44.15
l_b,int, Bicycle LOS Score for Intersection	2.304	4.309	1.731
Bicycle LOS	B	E	A

Sequence

Ring 1	-	2	3	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 12: Carbon Canyon Road at Fairway Drive/Ginseng Lane

Control Type:	Two-way stop	Delay (sec / veh):	50.6
Analysis Method:	HCM 7th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.310

Intersection Setup

Name	Carbon Canyon Road			Carbon Canyon Road			Fairway Drive			Ginseng Lane		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	0	0	0	1	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	45.00			45.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			No			No		

Volumes

Name	Carbon Canyon Road			Carbon Canyon Road			Fairway Drive			Ginseng Lane		
Base Volume Input [veh/h]	23	524	0	1	1564	26	33	0	28	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	23	524	0	1	1564	26	33	0	28	0	0	0
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	6	138	0	0	412	7	9	0	7	0	0	0
Total Analysis Volume [veh/h]	24	552	0	1	1646	27	35	0	29	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Free	Free	Stop	Stop
Flared Lane				No
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance			Yes	Yes
Number of Storage Spaces in Median	0	0	2	2

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.06	0.01	0.00	0.00	0.02	0.00	0.31	0.00	0.24	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	15.02	0.00	0.00	8.54	0.00	0.00	50.63	44.46	44.12	61.77	35.51	11.75
Movement LOS	C	A	A	A	A	A	F	E	E	F	E	B
95th-Percentile Queue Length [veh/ln]	0.20	0.00	0.00	0.00	0.00	0.00	1.20	1.20	0.88	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	4.99	0.00	0.00	0.07	0.00	0.00	30.02	30.02	22.08	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	0.63			0.01			47.68			36.34		
Approach LOS	A			A			E			E		
d_I, Intersection Delay [s/veh]	1.48											
Intersection LOS	F											

Intersection Level Of Service Report
Intersection 13: Carbon Canyon Road at Canyon Hills Road

Control Type:	Two-way stop	Delay (sec / veh):	86.9
Analysis Method:	HCM 7th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.402

Intersection Setup

Name	Carbon Canyon Road		Carbon Canyon Road		Canyon Hills Road	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	45.00		45.00		25.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name	Carbon Canyon Road		Carbon Canyon Road		Canyon Hills Road	
Base Volume Input [veh/h]	16	412	1552	30	52	47
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	16	412	1552	30	52	47
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	4	108	408	8	14	12
Total Analysis Volume [veh/h]	17	434	1634	32	55	49
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			Yes
Number of Storage Spaces in Median	0	0	2

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.04	0.00	0.02	0.00	0.35	0.40
d_M, Delay for Movement [s/veh]	14.76	0.00	0.00	0.00	80.08	86.93
Movement LOS	B	A	A	A	F	F
95th-Percentile Queue Length [veh/ln]	0.14	0.00	0.00	0.00	4.42	4.42
95th-Percentile Queue Length [ft/ln]	3.45	0.00	0.00	0.00	110.61	110.61
d_A, Approach Delay [s/veh]	0.56		0.00		83.31	
Approach LOS	A		A		F	
d_I, Intersection Delay [s/veh]	4.01					
Intersection LOS	F					

Intersection Level Of Service Report
Intersection 12: Carbon Canyon Road at Fairway Drive/Ginseng Lane

Control Type:	Roundabout	Delay (sec / veh):	105.0
Analysis Method:	HCM 7th Edition	Level Of Service:	F
Analysis Period:	15 minutes		

Intersection Setup

Name	Carbon Canyon Road			Carbon Canyon Road			Fairway Drive			Ginseng Lane		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	45.00			45.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			No			No		

Volumes

Name	Carbon Canyon Road			Carbon Canyon Road			Fairway Drive			Ginseng Lane		
Base Volume Input [veh/h]	23	539	0	1	1570	26	33	0	28	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	23	539	0	1	1570	26	33	0	28	0	0	0
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	6	142	0	0	413	7	9	0	7	0	0	0
Total Analysis Volume [veh/h]	24	567	0	1	1653	27	35	0	29	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Number of Conflicting Circulating Lanes	1			1			1			1		
Circulating Flow Rate [veh/h]	37			24			1687			639		
Exiting Flow Rate [veh/h]	1716			614			52			1		
Demand Flow Rate [veh/h]	23	539	0	1	1570	26	33	0	28	0	0	0
Adjusted Demand Flow Rate [veh/h]	24	567	0	1	1653	27	35	0	29	0	0	0

Lanes

Overwrite Calculated Critical Headway	No	No	No	No
User-Defined Critical Headway [s]	4.00	4.00	4.00	4.00
Overwrite Calculated Follow-Up Time	No	No	No	No
User-Defined Follow-Up Time [s]	3.00	3.00	3.00	3.00
A (intercept)	1380.00	1380.00	1380.00	1380.00
B (coefficient)	0.00102	0.00102	0.00102	0.00102
HV Adjustment Factor	0.98	0.98	0.98	0.98
Entry Flow Rate [veh/h]	603	1715	66	0
Capacity of Entry and Bypass Lanes [veh/h]	1330	1346	247	720
Pedestrian Impedance	1.00	1.00	1.00	1.00
Capacity per Entry Lane [veh/h]	1304	1320	243	706
X, volume / capacity	0.45	1.27	0.26	0.00

Movement, Approach, & Intersection Results

Lane LOS	A	F	C	A
95th-Percentile Queue Length [veh]	2.42	56.36	1.03	0.00
95th-Percentile Queue Length [ft]	60.59	1409.06	25.76	0.00
Approach Delay [s/veh]	7.30	142.58	21.46	5.10
Approach LOS	A	F	C	A
Intersection Delay [s/veh]	105.03			
Intersection LOS	F			

Intersection Level Of Service Report
Intersection 13: Carbon Canyon Road at Canyon Hills Road

Control Type:	Roundabout	Delay (sec / veh):	102.9
Analysis Method:	HCM 7th Edition	Level Of Service:	F
Analysis Period:	15 minutes		

Intersection Setup

Name	Carbon Canyon Road		Carbon Canyon Road		Canyon Hills Road	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	45.00		45.00		25.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name	Carbon Canyon Road		Carbon Canyon Road		Canyon Hills Road	
Base Volume Input [veh/h]	16	412	1552	30	52	47
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00					
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	16	412	1552	30	52	47
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	4	108	408	8	14	12
Total Analysis Volume [veh/h]	17	434	1634	32	55	49
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Number of Conflicting Circulating Lanes	1		1		1	
Circulating Flow Rate [veh/h]	56		17		1667	
Exiting Flow Rate [veh/h]	1717		499		50	
Demand Flow Rate [veh/h]	16	412	1552	30	52	47
Adjusted Demand Flow Rate [veh/h]	17	434	1634	32	55	49

Lanes

Overwrite Calculated Critical Headway	No	No	No
User-Defined Critical Headway [s]	4.00	4.00	4.00
Overwrite Calculated Follow-Up Time	No	No	No
User-Defined Follow-Up Time [s]	3.00	3.00	3.00
A (intercept)	1380.00	1380.00	1380.00
B (coefficient)	0.00102	0.00102	0.00102
HV Adjustment Factor	0.98	0.98	0.98
Entry Flow Rate [veh/h]	461	1700	107
Capacity of Entry and Bypass Lanes [veh/h]	1304	1356	253
Pedestrian Impedance	1.00	1.00	1.00
Capacity per Entry Lane [veh/h]	1278	1330	248
X, volume / capacity	0.35	1.25	0.42

Movement, Approach, & Intersection Results

Lane LOS	A	F	D
95th-Percentile Queue Length [veh]	1.61	53.73	1.96
95th-Percentile Queue Length [ft]	40.29	1343.14	49.10
Approach Delay [s/veh]	6.11	133.83	26.85
Approach LOS	A	F	D
Intersection Delay [s/veh]	102.89		
Intersection LOS	F		

Intersection Level Of Service Report
Intersection 12: Carbon Canyon Road at Fairway Drive/Ginseng Lane

Control Type:	Signalized	Delay (sec / veh):	22.4
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.982

Intersection Setup

Name	Carbon Canyon Road			Carbon Canyon Road			Fairway Drive			Ginseng Lane		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	0	0	0	1	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	45.00			45.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			No		

Volumes

Name	Carbon Canyon Road			Carbon Canyon Road			Fairway Drive			Ginseng Lane		
Base Volume Input [veh/h]	28	1583	4	9	639	37	33	0	26	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	28	1583	4	9	639	37	33	0	26	0	0	0
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	7	417	1	2	168	10	9	0	7	0	0	0
Total Analysis Volume [veh/h]	29	1666	4	9	673	39	35	0	27	0	0	0
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	6	0	0	2	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	6	0	0	6	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	98	0	0	98	0	0	22	0	0	22	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	0	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	14	0	0	11	0	0	11	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	L	C	C	R	C
C, Cycle Length [s]	120	120	120	120	120	120	120
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	2.00	0.00	2.00	0.00	2.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	107	107	107	107	5	5	5
g / C, Green / Cycle	0.89	0.89	0.89	0.89	0.04	0.04	0.04
(v / s)_i Volume / Saturation Flow Rate	0.04	0.89	0.03	0.38	0.02	0.02	0.00
s, saturation flow rate [veh/h]	738	1869	297	1852	1544	1589	1502
c, Capacity [veh/h]	648	1662	60	1647	128	70	96
d1, Uniform Delay [s]	2.57	6.64	59.94	1.19	55.90	55.73	0.00
k, delay calibration	0.50	0.50	0.50	0.50	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.13	23.21	5.13	0.83	1.14	3.45	0.00
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.04	1.00	0.15	0.43	0.27	0.39	0.00
d, Delay for Lane Group [s/veh]	2.70	29.85	65.08	2.02	57.04	59.19	0.00
Lane Group LOS	A	F	E	A	E	E	A
Critical Lane Group	No	Yes	No	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	0.12	12.48	0.35	0.52	1.08	0.87	0.00
50th-Percentile Queue Length [ft/ln]	2.99	312.08	8.85	12.89	27.09	21.73	0.00
95th-Percentile Queue Length [veh/ln]	0.22	18.35	0.64	0.93	1.95	1.56	0.00
95th-Percentile Queue Length [ft/ln]	5.38	458.83	15.93	23.21	48.77	39.11	0.00

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	2.70	29.85	29.85	65.08	2.02	2.02	57.04	57.04	59.19	0.00	0.00	0.00
Movement LOS	A	F	C	E	A	A	E	E	E	A	A	A
d_A, Approach Delay [s/veh]	29.38			2.81			57.97			0.00		
Approach LOS	C			A			E			A		
d_I, Intersection Delay [s/veh]	22.38											
Intersection LOS	C											
Intersection V/C	0.982											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	0.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	49.48	49.48	49.48	0.00
l_p,int, Pedestrian LOS Score for Intersection	3.123	3.184	2.030	0.000
Crosswalk LOS	C	C	B	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	1567	1567	300	300
d_b, Bicycle Delay [s]	2.81	2.81	43.33	43.33
l_b,int, Bicycle LOS Score for Intersection	4.363	2.749	1.662	1.560
Bicycle LOS	E	B	A	A

Sequence

Ring 1	-	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 13: Carbon Canyon Road at Canyon Hills Road

Control Type:	Signalized	Delay (sec / veh):	26.1
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.937

Intersection Setup

Name	Carbon Canyon Road		Carbon Canyon Road		Canyon Hills Road	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	45.00		45.00		25.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	No		No		No	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	Carbon Canyon Road		Carbon Canyon Road		Canyon Hills Road	
Base Volume Input [veh/h]	26	1591	547	57	36	30
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00					
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	26	1591	547	57	36	30
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	7	419	144	15	9	8
Total Analysis Volume [veh/h]	27	1675	576	60	38	32
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0		0		0	
v_di, Inbound Pedestrian Volume crossing m	0		0		0	
v_co, Outbound Pedestrian Volume crossing	0		0		0	
v_ci, Inbound Pedestrian Volume crossing mi	0		0		0	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permissive	Permissive	Permissive	Permissive	Permissive	Permissive
Signal Group	0	6	2	0	3	0
Auxiliary Signal Groups						
Lead / Lag	-	-	-	-	Lead	-
Minimum Green [s]	0	6	6	0	6	0
Maximum Green [s]	0	30	30	0	30	0
Amber [s]	0.0	3.0	3.0	0.0	3.0	0.0
All red [s]	0.0	1.0	1.0	0.0	1.0	0.0
Split [s]	0	99	99	0	21	0
Vehicle Extension [s]	0.0	3.0	3.0	0.0	3.0	0.0
Walk [s]	0	0	7	0	7	0
Pedestrian Clearance [s]	0	0	7	0	11	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No	No		No	
I1, Start-Up Lost Time [s]	0.0	2.0	2.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	2.0	0.0	2.0	0.0
Minimum Recall		No	No		No	
Maximum Recall		No	No		No	
Pedestrian Recall		No	No		No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	C
C, Cycle Length [s]	120	120	120	120
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	106	106	106	6
g / C, Green / Cycle	0.88	0.88	0.88	0.05
(v / s)_i Volume / Saturation Flow Rate	0.03	0.90	0.35	0.04
s, saturation flow rate [veh/h]	792	1870	1839	1688
c, Capacity [veh/h]	690	1647	1620	89
d1, Uniform Delay [s]	2.59	7.16	1.31	56.13
k, delay calibration	0.50	0.50	0.50	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.11	26.56	0.72	14.14
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.04	1.02	0.39	0.79
d, Delay for Lane Group [s/veh]	2.69	33.71	2.02	70.27
Lane Group LOS	A	F	A	E
Critical Lane Group	No	Yes	No	Yes
50th-Percentile Queue Length [veh/ln]	0.11	17.81	0.72	2.46
50th-Percentile Queue Length [ft/ln]	2.77	445.19	18.03	61.50
95th-Percentile Queue Length [veh/ln]	0.20	25.12	1.30	4.43
95th-Percentile Queue Length [ft/ln]	4.98	627.93	32.45	110.71

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	2.69	33.71	2.02	2.02	70.27	70.27
Movement LOS	A	F	A	A	E	E
d_A, Approach Delay [s/veh]	33.22		2.02		70.27	
Approach LOS	C		A		E	
d_I, Intersection Delay [s/veh]	26.06					
Intersection LOS	C					
Intersection V/C	0.937					

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	49.48	49.48	49.48
l_p,int, Pedestrian LOS Score for Intersection	3.080	3.446	1.831
Crosswalk LOS	C	C	A
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	1584	1584	283
d_b, Bicycle Delay [s]	2.59	2.59	44.18
l_b,int, Bicycle LOS Score for Intersection	4.368	2.609	1.675
Bicycle LOS	E	B	A

Sequence

Ring 1	-	2	3	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 12: Carbon Canyon Road at Fairway Drive/Ginseng Lane

Control Type:	Two-way stop	Delay (sec / veh):	67.5
Analysis Method:	HCM 7th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.385

Intersection Setup

Name	Carbon Canyon Road			Carbon Canyon Road			Fairway Drive			Ginseng Lane		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	0	0	0	1	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	45.00			45.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			No			No		

Volumes

Name	Carbon Canyon Road			Carbon Canyon Road			Fairway Drive			Ginseng Lane		
Base Volume Input [veh/h]	28	1583	4	9	639	37	33	0	26	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	28	1583	4	9	639	37	33	0	26	0	0	0
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	7	417	1	2	168	10	9	0	7	0	0	0
Total Analysis Volume [veh/h]	29	1666	4	9	673	39	35	0	27	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Free	Free	Stop	Stop
Flared Lane				No
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance			Yes	Yes
Number of Storage Spaces in Median	0	0	2	2

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.03	0.02	0.00	0.02	0.01	0.00	0.38	0.00	0.06	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	9.19	0.00	0.00	14.59	0.00	0.00	67.49	58.84	13.64	41.97	34.30	35.24
Movement LOS	A	A	A	B	A	A	F	F	B	E	D	E
95th-Percentile Queue Length [veh/ln]	0.10	0.00	0.00	0.07	0.00	0.00	1.54	1.54	0.19	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	2.53	0.00	0.00	1.80	0.00	0.00	38.48	38.48	4.84	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	0.16			0.18			44.04			37.17		
Approach LOS	A			A			E			E		
d_I, Intersection Delay [s/veh]	1.26											
Intersection LOS	F											

Intersection Level Of Service Report
Intersection 13: Carbon Canyon Road at Canyon Hills Road

Control Type:	Two-way stop	Delay (sec / veh):	39.0
Analysis Method:	HCM 7th Edition	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.270

Intersection Setup

Name	Carbon Canyon Road		Carbon Canyon Road		Canyon Hills Road	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	45.00		45.00		25.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name	Carbon Canyon Road		Carbon Canyon Road		Canyon Hills Road	
Base Volume Input [veh/h]	26	1591	547	57	36	30
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	26	1591	547	57	36	30
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	7	419	144	15	9	8
Total Analysis Volume [veh/h]	27	1675	576	60	38	32
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			Yes
Number of Storage Spaces in Median	0	0	2

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.03	0.02	0.01	0.00	0.27	0.06
d_M, Delay for Movement [s/veh]	8.91	0.00	0.00	0.00	39.05	20.67
Movement LOS	A	A	A	A	E	C
95th-Percentile Queue Length [veh/ln]	0.09	0.00	0.00	0.00	1.40	1.40
95th-Percentile Queue Length [ft/ln]	2.20	0.00	0.00	0.00	34.94	34.94
d_A, Approach Delay [s/veh]	0.14		0.00		30.65	
Approach LOS	A		A		D	
d_I, Intersection Delay [s/veh]	0.99					
Intersection LOS	E					

Intersection Level Of Service Report
Intersection 12: Carbon Canyon Road at Fairway Drive/Ginseng Lane

Control Type:	Roundabout	Delay (sec / veh):	114.3
Analysis Method:	HCM 7th Edition	Level Of Service:	F
Analysis Period:	15 minutes		

Intersection Setup

Name	Carbon Canyon Road			Carbon Canyon Road			Fairway Drive			Ginseng Lane		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	45.00			45.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			No			No		

Volumes

Name	Carbon Canyon Road			Carbon Canyon Road			Fairway Drive			Ginseng Lane		
Base Volume Input [veh/h]	28	1593	4	9	657	37	33	0	26	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	28	1593	4	9	657	37	33	0	26	0	0	0
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	7	419	1	2	173	10	9	0	7	0	0	0
Total Analysis Volume [veh/h]	29	1677	4	9	692	39	35	0	27	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Number of Conflicting Circulating Lanes	1			1			1			1		
Circulating Flow Rate [veh/h]	45			30			715			1776		
Exiting Flow Rate [veh/h]	733			1746			69			13		
Demand Flow Rate [veh/h]	28	1593	4	9	657	37	33	0	26	0	0	0
Adjusted Demand Flow Rate [veh/h]	29	1677	4	9	692	39	35	0	27	0	0	0

Lanes

Overwrite Calculated Critical Headway	No	No	No	No
User-Defined Critical Headway [s]	4.00	4.00	4.00	4.00
Overwrite Calculated Follow-Up Time	No	No	No	No
User-Defined Follow-Up Time [s]	3.00	3.00	3.00	3.00
A (intercept)	1380.00	1380.00	1380.00	1380.00
B (coefficient)	0.00102	0.00102	0.00102	0.00102
HV Adjustment Factor	0.98	0.98	0.98	0.98
Entry Flow Rate [veh/h]	1745	755	64	0
Capacity of Entry and Bypass Lanes [veh/h]	1319	1339	666	226
Pedestrian Impedance	1.00	1.00	1.00	1.00
Capacity per Entry Lane [veh/h]	1293	1313	653	222
X, volume / capacity	1.32	0.56	0.10	0.00

Movement, Approach, & Intersection Results

Lane LOS	F	A	A	C
95th-Percentile Queue Length [veh]	62.47	3.69	0.31	0.00
95th-Percentile Queue Length [ft]	1561.63	92.16	7.84	0.00
Approach Delay [s/veh]	163.82	9.04	6.57	16.28
Approach LOS	F	A	A	C
Intersection Delay [s/veh]	114.34			
Intersection LOS	F			

Intersection Level Of Service Report
Intersection 13: Carbon Canyon Road at Canyon Hills Road

Control Type:	Roundabout	Delay (sec / veh):	113.6
Analysis Method:	HCM 7th Edition	Level Of Service:	F
Analysis Period:	15 minutes		

Intersection Setup

Name	Carbon Canyon Road		Carbon Canyon Road		Canyon Hills Road	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	45.00		45.00		25.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name	Carbon Canyon Road		Carbon Canyon Road		Canyon Hills Road	
Base Volume Input [veh/h]	26	1591	547	57	36	30
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00					
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	26	1591	547	57	36	30
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	7	419	144	15	9	8
Total Analysis Volume [veh/h]	27	1675	576	60	38	32
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Number of Conflicting Circulating Lanes	1		1		1	
Circulating Flow Rate [veh/h]	39		28		588	
Exiting Flow Rate [veh/h]	620		1747		89	
Demand Flow Rate [veh/h]	26	1591	547	57	36	30
Adjusted Demand Flow Rate [veh/h]	27	1675	576	60	38	32

Lanes

Overwrite Calculated Critical Headway	No	No	No
User-Defined Critical Headway [s]	4.00	4.00	4.00
Overwrite Calculated Follow-Up Time	No	No	No
User-Defined Follow-Up Time [s]	3.00	3.00	3.00
A (intercept)	1380.00	1380.00	1380.00
B (coefficient)	0.00102	0.00102	0.00102
HV Adjustment Factor	0.98	0.98	0.98
Entry Flow Rate [veh/h]	1737	649	72
Capacity of Entry and Bypass Lanes [veh/h]	1327	1342	758
Pedestrian Impedance	1.00	1.00	1.00
Capacity per Entry Lane [veh/h]	1301	1316	744
X, volume / capacity	1.31	0.48	0.09

Movement, Approach, & Intersection Results

Lane LOS	F	A	A
95th-Percentile Queue Length [veh]	60.70	2.72	0.31
95th-Percentile Queue Length [ft]	1517.56	68.02	7.77
Approach Delay [s/veh]	157.58	7.69	5.82
Approach LOS	F	A	A
Intersection Delay [s/veh]	113.58		
Intersection LOS	F		

APPENDIX F-X

2040 WITH PROJECT

Intersection Level Of Service Report
Intersection 12: Carbon Canyon Road at Fairway Drive/Ginseng Lane

Control Type:	Signalized	Delay (sec / veh):	119.1
Analysis Method:	HCM 7th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.289

Intersection Setup

Name	Carbon Canyon Road			Carbon Canyon Road			Fairway Drive			Ginseng Lane		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	0	0	0	1	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	45.00			45.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			No		

Volumes

Name	Carbon Canyon Road			Carbon Canyon Road			Fairway Drive			Ginseng Lane		
Base Volume Input [veh/h]	24	663	0	1	2065	27	33	0	28	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	24	663	0	1	2065	27	33	0	28	0	0	0
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	6	174	0	0	543	7	9	0	7	0	0	0
Total Analysis Volume [veh/h]	25	698	0	1	2174	28	35	0	29	0	0	0
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	6	0	0	2	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	6	0	0	6	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	98	0	0	98	0	0	22	0	0	22	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	0	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	14	0	0	11	0	0	11	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	L	C	C	R	C
C, Cycle Length [s]	120	120	120	120	120	120	120
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	2.00	0.00	2.00	0.00	2.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	107	107	107	107	5	5	5
g / C, Green / Cycle	0.89	0.89	0.89	0.89	0.04	0.04	0.04
(v / s)_i Volume / Saturation Flow Rate	0.14	0.37	0.00	1.18	0.02	0.02	0.00
s, saturation flow rate [veh/h]	176	1870	747	1866	1543	1589	1523
c, Capacity [veh/h]	60	1662	658	1658	129	71	98
d1, Uniform Delay [s]	59.95	1.18	2.41	6.66	55.85	55.76	0.00
k, delay calibration	0.50	0.50	0.50	0.50	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	19.66	0.78	0.00	151.77	1.13	3.78	0.00
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.41	0.42	0.00	1.33	0.27	0.41	0.00
d, Delay for Lane Group [s/veh]	79.61	1.96	2.41	158.44	56.98	59.54	0.00
Lane Group LOS	E	A	A	F	E	E	A
Critical Lane Group	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	1.07	0.51	0.00	71.88	1.08	0.94	0.00
50th-Percentile Queue Length [ft/ln]	26.83	12.68	0.10	1796.94	27.07	23.41	0.00
95th-Percentile Queue Length [veh/ln]	1.93	0.91	0.01	108.24	1.95	1.69	0.00
95th-Percentile Queue Length [ft/ln]	48.29	22.83	0.17	2706.11	48.73	42.14	0.00

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	79.61	1.96	1.96	2.41	158.44	158.44	56.98	56.98	59.54	0.00	0.00	0.00
Movement LOS	E	A	A	A	F	F	E	E	E	A	A	A
d_A, Approach Delay [s/veh]	4.65			158.37			58.14			0.00		
Approach LOS	A			F			E			A		
d_I, Intersection Delay [s/veh]	119.05											
Intersection LOS	F											
Intersection V/C	1.289											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	0.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	49.48	49.48	49.48	0.00
l_p,int, Pedestrian LOS Score for Intersection	3.380	3.435	2.021	0.000
Crosswalk LOS	C	C	B	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	1567	1567	300	300
d_b, Bicycle Delay [s]	2.81	2.81	43.33	43.33
l_b,int, Bicycle LOS Score for Intersection	2.753	5.195	1.665	1.560
Bicycle LOS	C	F	A	A

Sequence

Ring 1	-	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 13: Carbon Canyon Road at Canyon Hills Road

Control Type:	Signalized	Delay (sec / veh):	143.0
Analysis Method:	HCM 7th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.251

Intersection Setup

Name	Carbon Canyon Road			Carbon Canyon Road			Canyon Hills Road			Canyon Hills Road		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	1	0	0	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	45.00			45.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			No		

Volumes

Name	Carbon Canyon Road			Carbon Canyon Road			Canyon Hills Road			Canyon Hills Road		
Base Volume Input [veh/h]	17	576	5	6	2063	32	55	0	49	13	0	16
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	17	576	5	6	2063	32	55	0	49	13	0	16
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	4	152	1	2	543	8	14	0	13	3	0	4
Total Analysis Volume [veh/h]	18	606	5	6	2172	34	58	0	52	14	0	17
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	6	0	0	2	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	6	0	0	6	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	91	0	0	91	0	0	29	0	0	29	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	0	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	21	0	0	18	0	0	11	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	L	C	C	C
C, Cycle Length [s]	120	120	120	120	120	120
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	2.00	0.00	2.00	2.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	102	102	102	102	10	10
g / C, Green / Cycle	0.85	0.85	0.85	0.85	0.08	0.08
(v / s)_i Volume / Saturation Flow Rate	0.10	0.33	0.01	1.18	0.07	0.02
s, saturation flow rate [veh/h]	176	1867	810	1865	1609	1569
c, Capacity [veh/h]	60	1589	673	1587	178	173
d1, Uniform Delay [s]	59.95	1.98	3.58	8.94	53.93	51.42
k, delay calibration	0.50	0.50	0.50	0.50	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	12.24	0.71	0.02	179.50	3.44	0.49
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.30	0.38	0.01	1.39	0.62	0.18
d, Delay for Lane Group [s/veh]	72.19	2.69	3.60	188.43	57.37	51.91
Lane Group LOS	E	A	A	F	E	D
Critical Lane Group	No	No	No	Yes	Yes	No
50th-Percentile Queue Length [veh/ln]	0.74	1.58	0.03	93.94	3.46	0.91
50th-Percentile Queue Length [ft/ln]	18.51	39.38	0.80	2348.45	86.52	22.63
95th-Percentile Queue Length [veh/ln]	1.33	2.84	0.06	142.43	6.23	1.63
95th-Percentile Queue Length [ft/ln]	33.32	70.88	1.44	3560.82	155.74	40.74

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	72.19	2.69	2.69	3.60	188.43	188.43	57.37	57.37	57.37	51.91	51.91	51.91
Movement LOS	E	A	A	A	F	F	E	E	E	D	D	D
d_A, Approach Delay [s/veh]	4.67			187.93			57.37			51.91		
Approach LOS	A			F			E			D		
d_I, Intersection Delay [s/veh]	143.05											
Intersection LOS	F											
Intersection V/C	1.251											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	0.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	49.48	49.48	49.48	0.00
l_p,int, Pedestrian LOS Score for Intersection	3.372	3.447	1.820	0.000
Crosswalk LOS	C	C	A	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	1451	1451	417	417
d_b, Bicycle Delay [s]	4.53	4.53	37.58	37.58
l_b,int, Bicycle LOS Score for Intersection	2.597	5.209	1.741	1.611
Bicycle LOS	B	F	A	A

Sequence

Ring 1	-	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 12: Carbon Canyon Road at Fairway Drive/Ginseng Lane

Control Type:	Two-way stop	Delay (sec / veh):	146.2
Analysis Method:	HCM 7th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.631

Intersection Setup

Name	Carbon Canyon Road			Carbon Canyon Road			Fairway Drive			Ginseng Lane		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	0	0	0	1	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	45.00			45.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			No			No		

Volumes

Name	Carbon Canyon Road			Carbon Canyon Road			Fairway Drive			Ginseng Lane		
Base Volume Input [veh/h]	24	663	0	1	2065	27	33	0	28	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	24	663	0	1	2065	27	33	0	28	0	0	0
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	6	174	0	0	543	7	9	0	7	0	0	0
Total Analysis Volume [veh/h]	25	698	0	1	2174	28	35	0	29	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Free	Free	Stop	Stop
Flared Lane				No
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance			Yes	Yes
Number of Storage Spaces in Median	0	0	2	2

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.10	0.01	0.00	0.00	0.02	0.00	0.63	0.00	0.50	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	21.85	0.00	0.00	9.01	0.00	0.00	146.18	128.35	119.06	953.16	73.14	13.17
Movement LOS	C	A	A	A	A	A	F	F	F	F	F	B
95th-Percentile Queue Length [veh/ln]	0.35	0.00	0.00	0.00	0.00	0.00	2.56	2.56	1.96	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	8.67	0.00	0.00	0.08	0.00	0.00	64.11	64.11	49.10	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	0.76			0.00			133.89			346.49		
Approach LOS	A			A			F			F		
d_I, Intersection Delay [s/veh]	3.05											
Intersection LOS	F											

Intersection Level Of Service Report
Intersection 13: Carbon Canyon Road at Canyon Hills Road

Control Type:	Two-way stop	Delay (sec / veh):	10,000.0
Analysis Method:	HCM 7th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	17.001

Intersection Setup

Name	Carbon Canyon Road			Carbon Canyon Road			Canyon Hills Road			Canyon Hills Road		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	1	0	0	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	45.00			45.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			No			No		

Volumes

Name	Carbon Canyon Road			Carbon Canyon Road			Canyon Hills Road			Canyon Hills Road		
Base Volume Input [veh/h]	17	576	5	6	2063	32	55	0	49	13	0	16
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	17	576	5	6	2063	32	55	0	49	13	0	16
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	4	152	1	2	543	8	14	0	13	3	0	4
Total Analysis Volume [veh/h]	18	606	5	6	2172	34	58	0	52	14	0	17
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Free	Free	Stop	Stop
Flared Lane			No	No
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance			Yes	Yes
Number of Storage Spaces in Median	0	0	2	2

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.08	0.01	0.00	0.01	0.02	0.00	1.11	0.00	0.90	17.00	0.00	0.03
d_M, Delay for Movement [s/veh]	21.38	0.00	0.00	8.74	0.00	0.00	637.79	618.53	631.35	10000.0	8987.71	8928.98
Movement LOS	C	A	A	A	A	A	F	F	F	F	F	F
95th-Percentile Queue Length [veh/ln]	0.24	0.00	0.00	0.02	0.00	0.00	10.76	10.76	10.76	5.69	5.69	5.69
95th-Percentile Queue Length [ft/ln]	6.09	0.00	0.00	0.47	0.00	0.00	269.10	269.10	269.10	142.26	142.26	142.26
d_A, Approach Delay [s/veh]	0.61			0.02			634.75			9412.67		
Approach LOS	A			A			F			F		
d_I, Intersection Delay [s/veh]	121.41											
Intersection LOS	F											

Intersection Level Of Service Report
Intersection 12: Carbon Canyon Road at Fairway Drive/Ginseng Lane

Control Type:	Roundabout	Delay (sec / veh):	800.7
Analysis Method:	HCM 7th Edition	Level Of Service:	F
Analysis Period:	15 minutes		

Intersection Setup

Name	Carbon Canyon Road			Carbon Canyon Road			Fairway Drive			Ginseng Lane		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	45.00			45.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			No			No		

Volumes

Name	Carbon Canyon Road			Carbon Canyon Road			Fairway Drive			Ginseng Lane		
Base Volume Input [veh/h]	24	663	687	1	2065	2093	33	0	61	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	24	663	687	1	2065	2093	33	0	61	0	0	0
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	6	174	181	0	543	551	9	0	16	0	0	0
Total Analysis Volume [veh/h]	25	698	723	1	2174	2203	35	0	64	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Number of Conflicting Circulating Lanes	1			1			1			1		
Circulating Flow Rate [veh/h]	37			26			2219			773		
Exiting Flow Rate [veh/h]	2283			748			2273			738		
Demand Flow Rate [veh/h]	24	663	687	1	2065	2093	33	0	61	0	0	0
Adjusted Demand Flow Rate [veh/h]	25	698	723	1	2174	2203	35	0	64	0	0	0

Lanes

Overwrite Calculated Critical Headway	No	No	No	No
User-Defined Critical Headway [s]	4.00	4.00	4.00	4.00
Overwrite Calculated Follow-Up Time	No	No	No	No
User-Defined Follow-Up Time [s]	3.00	3.00	3.00	3.00
A (intercept)	1380.00	1380.00	1380.00	1380.00
B (coefficient)	0.00102	0.00102	0.00102	0.00102
HV Adjustment Factor	0.98	0.98	0.98	0.98
Entry Flow Rate [veh/h]	1475	4466	101	0
Capacity of Entry and Bypass Lanes [veh/h]	1330	1345	144	628
Pedestrian Impedance	1.00	1.00	1.00	1.00
Capacity per Entry Lane [veh/h]	1304	1319	141	615
X, volume / capacity	1.11	3.32	0.70	0.00

Movement, Approach, & Intersection Results

Lane LOS	F	F	F	A
95th-Percentile Queue Length [veh]	33.86	386.72	4.02	0.00
95th-Percentile Queue Length [ft]	846.57	9667.99	100.45	0.00
Approach Delay [s/veh]	76.99	1056.16	74.35	5.85
Approach LOS	F	F	F	A
Intersection Delay [s/veh]	800.70			
Intersection LOS	F			

Intersection Level Of Service Report
Intersection 13: Carbon Canyon Road at Canyon Hills Road

Control Type:	Roundabout	Delay (sec / veh):	817.9
Analysis Method:	HCM 7th Edition	Level Of Service:	F
Analysis Period:	15 minutes		

Intersection Setup

Name	Carbon Canyon Road			Carbon Canyon Road			Canyon Hills Road			Canyon Hills Road		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	45.00			45.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			No			No		

Volumes

Name	Carbon Canyon Road			Carbon Canyon Road			Canyon Hills Road			Canyon Hills Road		
Base Volume Input [veh/h]	17	576	598	6	2063	2101	55	0	104	13	0	29
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	17	576	598	6	2063	2101	55	0	104	13	0	29
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	4	152	157	2	543	553	14	0	27	3	0	8
Total Analysis Volume [veh/h]	18	606	629	6	2172	2212	58	0	109	14	0	31
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Number of Conflicting Circulating Lanes	1			1			1			1		
Circulating Flow Rate [veh/h]	65			33			2236			696		
Exiting Flow Rate [veh/h]	2341			709			2275			648		
Demand Flow Rate [veh/h]	17	576	598	6	2063	2101	55	0	104	13	0	29
Adjusted Demand Flow Rate [veh/h]	18	606	629	6	2172	2212	58	0	109	14	0	31

Lanes

Overwrite Calculated Critical Headway	No	No	No	No
User-Defined Critical Headway [s]	4.00	4.00	4.00	4.00
Overwrite Calculated Follow-Up Time	No	No	No	No
User-Defined Follow-Up Time [s]	3.00	3.00	3.00	3.00
A (intercept)	1380.00	1380.00	1380.00	1380.00
B (coefficient)	0.00102	0.00102	0.00102	0.00102
HV Adjustment Factor	0.98	0.98	0.98	0.98
Entry Flow Rate [veh/h]	1279	4478	171	46
Capacity of Entry and Bypass Lanes [veh/h]	1292	1335	142	679
Pedestrian Impedance	1.00	1.00	1.00	1.00
Capacity per Entry Lane [veh/h]	1266	1309	139	666
X, volume / capacity	0.99	3.35	1.21	0.07

Movement, Approach, & Intersection Results

Lane LOS	F	F	F	A
95th-Percentile Queue Length [veh]	20.89	389.40	9.91	0.22
95th-Percentile Queue Length [ft]	522.30	9734.94	247.69	5.42
Approach Delay [s/veh]	41.19	1071.24	205.46	6.14
Approach LOS	F	F	F	A
Intersection Delay [s/veh]	817.92			
Intersection LOS	F			

Intersection Level Of Service Report
Intersection 12: Carbon Canyon Road at Fairway Drive/Ginseng Lane

Control Type:	Signalized	Delay (sec / veh):	106.3
Analysis Method:	HCM 7th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.284

Intersection Setup

Name	Carbon Canyon Road			Carbon Canyon Road			Fairway Drive			Ginseng Lane		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	0	0	0	1	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	45.00			45.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			No		

Volumes

Name	Carbon Canyon Road			Carbon Canyon Road			Fairway Drive			Ginseng Lane		
Base Volume Input [veh/h]	28	2083	4	9	910	37	34	0	27	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	28	2083	4	9	910	37	34	0	27	0	0	0
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	7	548	1	2	239	10	9	0	7	0	0	0
Total Analysis Volume [veh/h]	29	2193	4	9	958	39	36	0	28	0	0	0
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	8.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	6	0	0	2	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	6	0	0	6	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	98	0	0	98	0	0	22	0	0	22	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	0	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	14	0	0	11	0	0	11	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	L	C	C	R	C
C, Cycle Length [s]	120	120	120	120	120	120	120
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	2.00	0.00	2.00	0.00	2.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	107	107	107	107	5	5	5
g / C, Green / Cycle	0.89	0.89	0.89	0.89	0.04	0.04	0.04
(v / s)_i Volume / Saturation Flow Rate	0.05	1.18	0.05	0.54	0.02	0.02	0.00
s, saturation flow rate [veh/h]	565	1869	177	1857	1543	1589	1494
c, Capacity [veh/h]	475	1662	60	1651	129	71	96
d1, Uniform Delay [s]	4.42	6.66	59.95	1.60	55.88	55.72	0.00
k, delay calibration	0.50	0.50	0.50	0.50	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.25	149.32	5.16	1.65	1.17	3.57	0.00
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.06	1.32	0.15	0.60	0.28	0.40	0.00
d, Delay for Lane Group [s/veh]	4.67	155.98	65.11	3.25	57.06	59.29	0.00
Lane Group LOS	A	F	E	A	E	E	A
Critical Lane Group	No	Yes	No	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	0.19	70.88	0.35	1.04	1.12	0.90	0.00
50th-Percentile Queue Length [ft/ln]	4.82	1772.05	8.86	25.96	27.88	22.55	0.00
95th-Percentile Queue Length [veh/ln]	0.35	106.57	0.64	1.87	2.01	1.62	0.00
95th-Percentile Queue Length [ft/ln]	8.67	2664.34	15.94	46.73	50.18	40.59	0.00

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	4.67	155.98	155.98	65.11	3.25	3.25	57.06	57.06	59.29	0.00	0.00	0.00
Movement LOS	A	F	F	E	A	A	E	E	E	A	A	A
d_A, Approach Delay [s/veh]	154.01			3.80			58.04			0.00		
Approach LOS	F			A			E			A		
d_I, Intersection Delay [s/veh]	106.30											
Intersection LOS	F											
Intersection V/C	1.284											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	0.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	49.48	49.48	49.48	0.00
l_p,int, Pedestrian LOS Score for Intersection	3.520	3.582	2.031	0.000
Crosswalk LOS	D	D	B	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	1567	1567	300	300
d_b, Bicycle Delay [s]	2.81	2.81	43.33	43.33
l_b,int, Bicycle LOS Score for Intersection	5.233	3.220	1.665	1.560
Bicycle LOS	F	C	A	A

Sequence

Ring 1	-	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 13: Carbon Canyon Road at Canyon Hills Road

Control Type:	Signalized	Delay (sec / veh):	119.6
Analysis Method:	HCM 7th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.238

Intersection Setup

Name	Carbon Canyon Road			Carbon Canyon Road			Canyon Hills Road			Canyon Hills Road		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	1	0	0	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	45.00			45.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			No		

Volumes

Name	Carbon Canyon Road			Carbon Canyon Road			Canyon Hills Road			Canyon Hills Road		
Base Volume Input [veh/h]	27	2101	15	19	844	60	38	0	32	8	0	11
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	27	2101	15	19	844	60	38	0	32	8	0	11
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	7	553	4	5	222	16	10	0	8	2	0	3
Total Analysis Volume [veh/h]	28	2212	16	20	888	63	40	0	34	8	0	12
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal Group	0	6	0	0	2	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	6	0	0	6	0	0	6	0
Maximum Green [s]	0	30	0	0	30	0	0	30	0	0	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	0	91	0	0	91	0	0	29	0	0	29	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	0	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	21	0	0	18	0	0	11	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall		No			No			No			No	
Maximum Recall		No			No			No			No	
Pedestrian Recall		No			No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	L	C	C	C
C, Cycle Length [s]	120	120	120	120	120	120
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	2.00	0.00	2.00	2.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	105	105	105	105	7	7
g / C, Green / Cycle	0.88	0.88	0.88	0.88	0.06	0.06
(v / s)_i Volume / Saturation Flow Rate	0.05	1.19	0.12	0.51	0.05	0.01
s, saturation flow rate [veh/h]	590	1868	172	1848	1636	1753
c, Capacity [veh/h]	486	1638	60	1621	139	141
d1, Uniform Delay [s]	4.86	7.38	59.95	1.87	55.72	54.01
k, delay calibration	0.50	0.50	0.50	0.50	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.23	166.30	14.16	1.56	3.17	0.46
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.06	1.36	0.33	0.59	0.53	0.14
d, Delay for Lane Group [s/veh]	5.09	173.68	74.11	3.44	58.88	54.47
Lane Group LOS	A	F	E	A	E	D
Critical Lane Group	No	Yes	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	0.20	82.64	0.83	1.74	2.35	0.60
50th-Percentile Queue Length [ft/ln]	4.94	2066.04	20.80	43.38	58.73	15.01
95th-Percentile Queue Length [veh/ln]	0.36	125.02	1.50	3.12	4.23	1.08
95th-Percentile Queue Length [ft/ln]	8.89	3125.61	37.45	78.08	105.72	27.03

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	5.09	173.68	173.68	74.11	3.44	3.44	58.88	58.88	58.88	54.47	54.47	54.47
Movement LOS	A	F	F	E	A	A	E	E	E	D	D	D
d_A, Approach Delay [s/veh]	171.59			4.89			58.88			54.47		
Approach LOS	F			A			E			D		
d_I, Intersection Delay [s/veh]	119.63											
Intersection LOS	F											
Intersection V/C	1.238											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	11.0	0.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	49.48	49.48	49.48	0.00
l_p,int, Pedestrian LOS Score for Intersection	3.519	3.588	1.835	0.000
Crosswalk LOS	D	D	A	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	1451	1451	417	417
d_b, Bicycle Delay [s]	4.53	4.53	37.58	37.58
l_b,int, Bicycle LOS Score for Intersection	5.282	3.162	1.682	1.593
Bicycle LOS	F	C	A	A

Sequence

Ring 1	-	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 12: Carbon Canyon Road at Fairway Drive/Ginseng Lane

Control Type:	Two-way stop	Delay (sec / veh):	669.8
Analysis Method:	HCM 7th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.608

Intersection Setup

Name	Carbon Canyon Road			Carbon Canyon Road			Fairway Drive			Ginseng Lane		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	0	0	0	1	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	45.00			45.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			No			No		

Volumes

Name	Carbon Canyon Road			Carbon Canyon Road			Fairway Drive			Ginseng Lane		
Base Volume Input [veh/h]	28	2083	4	9	910	37	34	0	27	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	28	2083	4	9	910	37	34	0	27	0	0	0
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	7	548	1	2	239	10	9	0	7	0	0	0
Total Analysis Volume [veh/h]	29	2193	4	9	958	39	36	0	28	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Free	Free	Stop	Stop
Flared Lane				No
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance			Yes	Yes
Number of Storage Spaces in Median	0	0	2	2

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.04	0.02	0.00	0.04	0.01	0.00	1.61	0.00	0.09	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	10.41	0.00	0.00	20.60	0.00	0.00	669.82	612.58	18.04	122.71	88.81	68.14
Movement LOS	B	A	A	C	A	A	F	F	C	F	F	F
95th-Percentile Queue Length [veh/ln]	0.13	0.00	0.00	0.12	0.00	0.00	4.62	4.62	0.30	0.00	0.00	0.00
95th-Percentile Queue Length [ft/ln]	3.27	0.00	0.00	2.91	0.00	0.00	115.54	115.54	7.54	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	0.14			0.18			384.67			93.22		
Approach LOS	A			A			F			F		
d_I, Intersection Delay [s/veh]	7.62											
Intersection LOS	F											

Intersection Level Of Service Report
Intersection 13: Carbon Canyon Road at Canyon Hills Road

Control Type:	Two-way stop	Delay (sec / veh):	913.4
Analysis Method:	HCM 7th Edition	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	2.143

Intersection Setup

Name	Carbon Canyon Road			Carbon Canyon Road			Canyon Hills Road			Canyon Hills Road		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	1	0	0	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	45.00			45.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			No			No		

Volumes

Name	Carbon Canyon Road			Carbon Canyon Road			Canyon Hills Road			Canyon Hills Road		
Base Volume Input [veh/h]	27	2101	15	19	844	60	38	0	32	8	0	11
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	27	2101	15	19	844	60	38	0	32	8	0	11
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	7	553	4	5	222	16	10	0	8	2	0	3
Total Analysis Volume [veh/h]	28	2212	16	20	888	63	40	0	34	8	0	12
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Free	Free	Stop	Stop
Flared Lane			No	No
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance			Yes	Yes
Number of Storage Spaces in Median	0	0	2	2

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.04	0.02	0.00	0.09	0.01	0.00	2.14	0.00	0.10	0.17	0.00	0.22
d_M, Delay for Movement [s/veh]	10.19	0.00	0.00	21.89	0.00	0.00	913.39	794.92	731.45	120.64	98.57	109.34
Movement LOS	B	A	A	C	A	A	F	F	F	F	F	F
95th-Percentile Queue Length [veh/ln]	0.12	0.00	0.00	0.28	0.00	0.00	8.43	8.43	8.43	1.40	1.40	1.40
95th-Percentile Queue Length [ft/ln]	3.02	0.00	0.00	6.97	0.00	0.00	210.66	210.66	210.66	35.12	35.12	35.12
d_A, Approach Delay [s/veh]	0.13			0.45			829.80			113.86		
Approach LOS	A			A			F			F		
d_I, Intersection Delay [s/veh]	19.39											
Intersection LOS	F											

Intersection Level Of Service Report
Intersection 12: Carbon Canyon Road at Fairway Drive/Ginseng Lane

Control Type:	Roundabout	Delay (sec / veh):	831.9
Analysis Method:	HCM 7th Edition	Level Of Service:	F
Analysis Period:	15 minutes		

Intersection Setup

Name	Carbon Canyon Road			Carbon Canyon Road			Fairway Drive			Ginseng Lane		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	45.00			45.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			No			No		

Volumes

Name	Carbon Canyon Road			Carbon Canyon Road			Fairway Drive			Ginseng Lane		
Base Volume Input [veh/h]	28	2083	2115	9	910	956	34	0	61	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	28	2083	2115	9	910	956	34	0	61	0	0	0
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	7	548	557	2	239	252	9	0	16	0	0	0
Total Analysis Volume [veh/h]	29	2193	2226	9	958	1006	36	0	64	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Number of Conflicting Circulating Lanes	1			1			1			1		
Circulating Flow Rate [veh/h]	46			30			986			2303		
Exiting Flow Rate [veh/h]	1042			2274			1056			2280		
Demand Flow Rate [veh/h]	28	2083	2115	9	910	956	34	0	61	0	0	0
Adjusted Demand Flow Rate [veh/h]	29	2193	2226	9	958	1006	36	0	64	0	0	0

Lanes

Overwrite Calculated Critical Headway	No	No	No	No
User-Defined Critical Headway [s]	4.00	4.00	4.00	4.00
Overwrite Calculated Follow-Up Time	No	No	No	No
User-Defined Follow-Up Time [s]	3.00	3.00	3.00	3.00
A (intercept)	1380.00	1380.00	1380.00	1380.00
B (coefficient)	0.00102	0.00102	0.00102	0.00102
HV Adjustment Factor	0.98	0.98	0.98	0.98
Entry Flow Rate [veh/h]	4537	2013	103	0
Capacity of Entry and Bypass Lanes [veh/h]	1317	1339	505	132
Pedestrian Impedance	1.00	1.00	1.00	1.00
Capacity per Entry Lane [veh/h]	1292	1313	495	130
X, volume / capacity	3.45	1.50	0.20	0.00

Movement, Approach, & Intersection Results

Lane LOS	F	F	B	D
95th-Percentile Queue Length [veh]	398.80	90.69	0.75	0.00
95th-Percentile Queue Length [ft]	9970.00	2267.30	18.72	0.00
Approach Delay [s/veh]	1112.06	242.00	10.12	27.88
Approach LOS	F	F	B	D
Intersection Delay [s/veh]	831.91			
Intersection LOS	F			

Intersection Level Of Service Report
Intersection 13: Carbon Canyon Road at Canyon Hills Road

Control Type:	Roundabout	Delay (sec / veh):	858.2
Analysis Method:	HCM 7th Edition	Level Of Service:	F
Analysis Period:	15 minutes		

Intersection Setup

Name	Carbon Canyon Road			Carbon Canyon Road			Canyon Hills Road			Canyon Hills Road		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	45.00			45.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			No			No		

Volumes

Name	Carbon Canyon Road			Carbon Canyon Road			Canyon Hills Road			Canyon Hills Road		
Base Volume Input [veh/h]	27	2101	2143	19	844	923	38	0	70	8	0	19
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Proportion of CAVs [%]	0.00											
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	27	2101	2143	19	844	923	38	0	70	8	0	19
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	7	553	564	5	222	243	10	0	18	2	0	5
Total Analysis Volume [veh/h]	28	2212	2256	20	888	972	40	0	74	8	0	20
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Number of Conflicting Circulating Lanes	1			1			1			1		
Circulating Flow Rate [veh/h]	61			37			934			2326		
Exiting Flow Rate [veh/h]	989			2317			1020			2322		
Demand Flow Rate [veh/h]	27	2101	2143	19	844	923	38	0	70	8	0	19
Adjusted Demand Flow Rate [veh/h]	28	2212	2256	20	888	972	40	0	74	8	0	20

Lanes

Overwrite Calculated Critical Headway	No	No	No	No
User-Defined Critical Headway [s]	4.00	4.00	4.00	4.00
Overwrite Calculated Follow-Up Time	No	No	No	No
User-Defined Follow-Up Time [s]	3.00	3.00	3.00	3.00
A (intercept)	1380.00	1380.00	1380.00	1380.00
B (coefficient)	0.00102	0.00102	0.00102	0.00102
HV Adjustment Factor	0.98	0.98	0.98	0.98
Entry Flow Rate [veh/h]	4586	1918	117	29
Capacity of Entry and Bypass Lanes [veh/h]	1297	1330	533	129
Pedestrian Impedance	1.00	1.00	1.00	1.00
Capacity per Entry Lane [veh/h]	1272	1304	522	127
X, volume / capacity	3.54	1.44	0.22	0.22

Movement, Approach, & Intersection Results

Lane LOS	F	F	A	E
95th-Percentile Queue Length [veh]	407.26	80.82	0.83	0.80
95th-Percentile Queue Length [ft]	10181.41	2020.56	20.64	20.07
Approach Delay [s/veh]	1153.50	215.56	9.91	37.59
Approach LOS	F	F	A	E
Intersection Delay [s/veh]	858.17			
Intersection LOS	F			

APPENDIX G

TRAFFIC SIGNAL WARRANT ANALYSIS WORKSHEETS

APPENDIX G-I

EXISTING TRAFFIC CONDITIONS

Signal Warrants Report For Intersection 7: Pipeline Avenue at Woodview Road

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	Yes
#2	Four Hour Vehicular Volume	No
#3	Peak Hour	No

Intersection Warrants Parameters

Major Approaches	S, N
Minor Approaches	W
Speed > 40mph	No
Population < 10,000	No
Warrant Factor	100%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets
	S	N	W
1	526	199	216
2	510	193	210
3	500	189	205
4	468	177	192
5	416	157	171
6	410	155	168
7	405	153	166
8	368	139	151
9	363	137	149
10	358	135	147
11	310	117	127
12	289	109	119
13	284	107	117
14	210	80	86
15	210	80	86
16	147	56	60
17	84	32	35
18	84	32	35
19	47	18	19
20	26	10	11
21	16	6	6
22	5	2	2
23	5	2	2
24	5	2	2

Warrant Analysis by Hour

Hour	Major Streets		Minor Street		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	1	725	1	216	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	No
2	1	703	1	210	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	No
3	1	689	1	205	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	No
4	1	645	1	192	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	No	No
5	1	573	1	171	Yes	Yes	Yes	Yes	No	No	Yes	Yes	No	No
6	1	565	1	168	Yes	Yes	Yes	Yes	No	No	Yes	Yes	No	No
7	1	558	1	166	Yes	Yes	Yes	Yes	No	No	Yes	Yes	No	No
8	1	507	1	151	Yes	Yes	Yes	Yes	No	No	No	Yes	No	No
9	1	500	1	149	No	Yes	Yes	Yes	No	No	No	Yes	No	No
10	1	493	1	147	No	Yes	Yes	Yes	No	No	No	Yes	No	No
11	1	427	1	127	No	Yes	Yes	Yes	No	No	No	Yes	No	No
12	1	398	1	119	No	No	Yes	Yes	No	No	No	No	No	No
13	1	391	1	117	No	No	Yes	Yes	No	No	No	No	No	No
14	1	290	1	86	No	No	No	Yes	No	No	No	No	No	No
15	1	290	1	86	No	No	No	Yes	No	No	No	No	No	No
16	1	203	1	60	No	No	No	No	No	No	No	No	No	No
17	1	116	1	35	No	No	No	No	No	No	No	No	No	No
18	1	116	1	35	No	No	No	No	No	No	No	No	No	No
19	1	65	1	19	No	No	No	No	No	No	No	No	No	No
20	1	36	1	11	No	No	No	No	No	No	No	No	No	No
21	1	22	1	6	No	No	No	No	No	No	No	No	No	No
22	1	7	1	2	No	No	No	No	No	No	No	No	No	No
23	1	7	1	2	No	No	No	No	No	No	No	No	No	No
24	1	7	1	2	No	No	No	No	No	No	No	No	No	No
Hours Met					8	11	13	15	0	4	7	11	3	0

Warrant 3 Condition A

Orientation	W
Total Stopped Delay Per Vehicle on Minor Approach (s)	20.5
Number of Lanes on Minor Street Approach	1
VehicleHours of Stopped Delay on Minor Approach ([h]h:mm)	1:13
Delay Condition Met	No
Volume on Minor Street Approach During Same Hour	216
High Minor Volume Condition Met	Yes
Total Entering Volume on All Approaches During Same Hour	941
Number of Approaches on Intersection	3
Total Volume Condition Met	Yes
Warrant Met for Approach	No
Warrant Met for Intersection	**No**

Signal Warrants Report For Intersection 8: Pipeline Avenue at Soquel Canyon Parkway

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	No
#2	Four Hour Vehicular Volume	Yes
#3	Peak Hour	Yes

Intersection Warrants Parameters

Major Approaches	E, W
Minor Approaches	N
Speed > 40mph	Yes
Population < 10,000	No
Warrant Factor	70%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets
	E	W	N
1	489	64	385
2	474	62	373
3	465	61	366
4	435	57	343
5	386	51	304
6	381	50	300
7	377	49	296
8	342	45	270
9	337	44	266
10	333	44	262
11	289	38	227
12	269	35	212
13	264	35	208
14	196	26	154
15	196	26	154
16	137	18	108
17	78	10	62
18	78	10	62
19	44	6	35
20	24	3	19
21	15	2	12
22	5	1	4
23	5	1	4
24	5	1	4

Warrant Analysis by Hour

Hour	Major Streets		Minor Street		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	4	553	1	385	No	Yes	Yes	Yes	No	No	No	Yes	Yes	Yes
2	4	536	1	373	No	Yes	Yes	Yes	No	No	No	Yes	Yes	Yes
3	4	526	1	366	No	Yes	Yes	Yes	No	No	No	Yes	Yes	Yes
4	4	492	1	343	No	Yes	Yes	Yes	No	No	No	No	Yes	Yes
5	4	437	1	304	No	No	Yes	Yes	No	No	No	No	Yes	No
6	4	431	1	300	No	No	Yes	Yes	No	No	No	No	Yes	No
7	4	426	1	296	No	No	Yes	Yes	No	No	No	No	Yes	No
8	4	387	1	270	No	No	No	Yes	No	No	No	No	Yes	No
9	4	381	1	266	No	No	No	Yes	No	No	No	No	Yes	No
10	4	377	1	262	No	No	No	Yes	No	No	No	No	Yes	No
11	4	327	1	227	No	No	No	No	No	No	No	No	No	No
12	4	304	1	212	No	No	No	No	No	No	No	No	No	No
13	4	299	1	208	No	No	No	No	No	No	No	No	No	No
14	4	222	1	154	No	No	No	No	No	No	No	No	No	No
15	4	222	1	154	No	No	No	No	No	No	No	No	No	No
16	4	155	1	108	No	No	No	No	No	No	No	No	No	No
17	4	88	1	62	No	No	No	No	No	No	No	No	No	No
18	4	88	1	62	No	No	No	No	No	No	No	No	No	No
19	4	50	1	35	No	No	No	No	No	No	No	No	No	No
20	4	27	1	19	No	No	No	No	No	No	No	No	No	No
21	4	17	1	12	No	No	No	No	No	No	No	No	No	No
22	4	6	1	4	No	No	No	No	No	No	No	No	No	No
23	4	6	1	4	No	No	No	No	No	No	No	No	No	No
24	4	6	1	4	No	No	No	No	No	No	No	No	No	No
Hours Met					0	4	7	10	0	0	0	3	10	4

Warrant 3 Condition A

Orientation	N
Total Stopped Delay Per Vehicle on Minor Approach (s)	58.3
Number of Lanes on Minor Street Approach	1
VehicleHours of Stopped Delay on Minor Approach ([h]h:mm)	6:13
Delay Condition Met	Yes
Volume on Minor Street Approach During Same Hour	385
High Minor Volume Condition Met	Yes
Total Entering Volume on All Approaches During Same Hour	938
Number of Approaches on Intersection	3
Total Volume Condition Met	Yes
Warrant Met for Approach	Yes
Warrant Met for Intersection	**Yes**

Signal Warrants Report For Intersection 12: Carbon Canyon Road at Fairway Drive/Ginseng Lane

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	No
#2	Four Hour Vehicular Volume	No
#3	Peak Hour	No

Intersection Warrants Parameters

Major Approaches	S, N
Minor Approaches	E, W
Speed > 40mph	Yes
Population < 10,000	No
Warrant Factor	70%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets	
	S	N	E	W
1	361	1230	0	8
2	350	1193	0	8
3	343	1169	0	8
4	321	1095	0	7
5	285	972	0	6
6	282	959	0	6
7	278	947	0	6
8	253	861	0	6
9	249	849	0	6
10	245	836	0	5
11	213	726	0	5
12	199	677	0	4
13	195	664	0	4
14	144	492	0	3
15	144	492	0	3
16	101	344	0	2
17	58	197	0	1
18	58	197	0	1
19	32	111	0	1
20	18	62	0	0
21	11	37	0	0
22	4	12	0	0
23	4	12	0	0
24	4	12	0	0

Warrant Analysis by Hour

Hour	Major Streets		Minor Street		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	2	1591	2	8	No	No	No	No	No	No	No	No	No	No
2	2	1543	2	8	No	No	No	No	No	No	No	No	No	No
3	2	1512	2	8	No	No	No	No	No	No	No	No	No	No
4	2	1416	2	7	No	No	No	No	No	No	No	No	No	No
5	2	1257	2	6	No	No	No	No	No	No	No	No	No	No
6	2	1241	2	6	No	No	No	No	No	No	No	No	No	No
7	2	1225	2	6	No	No	No	No	No	No	No	No	No	No
8	2	1114	2	6	No	No	No	No	No	No	No	No	No	No
9	2	1098	2	6	No	No	No	No	No	No	No	No	No	No
10	2	1081	2	5	No	No	No	No	No	No	No	No	No	No
11	2	939	2	5	No	No	No	No	No	No	No	No	No	No
12	2	876	2	4	No	No	No	No	No	No	No	No	No	No
13	2	859	2	4	No	No	No	No	No	No	No	No	No	No
14	2	636	2	3	No	No	No	No	No	No	No	No	No	No
15	2	636	2	3	No	No	No	No	No	No	No	No	No	No
16	2	445	2	2	No	No	No	No	No	No	No	No	No	No
17	2	255	2	1	No	No	No	No	No	No	No	No	No	No
18	2	255	2	1	No	No	No	No	No	No	No	No	No	No
19	2	143	2	1	No	No	No	No	No	No	No	No	No	No
20	2	80	2	0	No	No	No	No	No	No	No	No	No	No
21	2	48	2	0	No	No	No	No	No	No	No	No	No	No
22	2	16	2	0	No	No	No	No	No	No	No	No	No	No
23	2	16	2	0	No	No	No	No	No	No	No	No	No	No
24	2	16	2	0	No	No	No	No	No	No	No	No	No	No
Hours Met					0	0	0	0	0	0	0	0	0	0

Warrant 3 Condition A

Orientation	E	W
Total Stopped Delay Per Vehicle on Minor Approach (s)	37.8	41.3
Number of Lanes on Minor Street Approach	1	2
VehicleHours of Stopped Delay on Minor Approach ([h]h:mm)	0:00	0:05
Delay Condition Met	No	No
Volume on Minor Street Approach During Same Hour	0	8
High Minor Volume Condition Met	No	No
Total Entering Volume on All Approaches During Same Hour	1599	1599
Number of Approaches on Intersection	4	4
Total Volume Condition Met	Yes	Yes
Warrant Met for Approach	No	No
Warrant Met for Intersection	**No**	

Signal Warrants Report For Intersection 13: Carbon Canyon Road at Canyon Hills Road

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	No
#2	Four Hour Vehicular Volume	No
#3	Peak Hour	No

Intersection Warrants Parameters

Major Approaches	S, N
Minor Approaches	W
Speed > 40mph	Yes
Population < 10,000	No
Warrant Factor	70%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets
	S	N	W
1	265	1209	65
2	257	1173	63
3	252	1149	62
4	236	1076	58
5	209	955	51
6	207	943	51
7	204	931	50
8	186	846	46
9	183	834	45
10	180	822	44
11	156	713	38
12	146	665	36
13	143	653	35
14	106	484	26
15	106	484	26
16	74	339	18
17	42	193	10
18	42	193	10
19	24	109	6
20	13	60	3
21	8	36	2
22	3	12	1
23	3	12	1
24	3	12	1

Warrant Analysis by Hour

Hour	Major Streets		Minor Street		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	2	1474	1	65	No	No	No	No	No	Yes	Yes	Yes	Yes	No
2	2	1430	1	63	No	No	No	No	No	Yes	Yes	Yes	Yes	No
3	2	1401	1	62	No	No	No	No	No	Yes	Yes	Yes	Yes	No
4	2	1312	1	58	No	No	No	No	No	No	Yes	Yes	No	No
5	2	1164	1	51	No	No	No	No	No	No	No	Yes	No	No
6	2	1150	1	51	No	No	No	No	No	No	No	Yes	No	No
7	2	1135	1	50	No	No	No	No	No	No	No	Yes	No	No
8	2	1032	1	46	No	No	No	No	No	No	No	Yes	No	No
9	2	1017	1	45	No	No	No	No	No	No	No	Yes	No	No
10	2	1002	1	44	No	No	No	No	No	No	No	Yes	No	No
11	2	869	1	38	No	No	No	No	No	No	No	No	No	No
12	2	811	1	36	No	No	No	No	No	No	No	No	No	No
13	2	796	1	35	No	No	No	No	No	No	No	No	No	No
14	2	590	1	26	No	No	No	No	No	No	No	No	No	No
15	2	590	1	26	No	No	No	No	No	No	No	No	No	No
16	2	413	1	18	No	No	No	No	No	No	No	No	No	No
17	2	235	1	10	No	No	No	No	No	No	No	No	No	No
18	2	235	1	10	No	No	No	No	No	No	No	No	No	No
19	2	133	1	6	No	No	No	No	No	No	No	No	No	No
20	2	73	1	3	No	No	No	No	No	No	No	No	No	No
21	2	44	1	2	No	No	No	No	No	No	No	No	No	No
22	2	15	1	1	No	No	No	No	No	No	No	No	No	No
23	2	15	1	1	No	No	No	No	No	No	No	No	No	No
24	2	15	1	1	No	No	No	No	No	No	No	No	No	No
Hours Met					0	0	0	0	0	3	4	10	3	0

Warrant 3 Condition A

Orientation	W
Total Stopped Delay Per Vehicle on Minor Approach (s)	44.4
Number of Lanes on Minor Street Approach	1
VehicleHours of Stopped Delay on Minor Approach ([h]h:mm)	0:48
Delay Condition Met	No
Volume on Minor Street Approach During Same Hour	65
High Minor Volume Condition Met	No
Total Entering Volume on All Approaches During Same Hour	1539
Number of Approaches on Intersection	3
Total Volume Condition Met	Yes
Warrant Met for Approach	No
Warrant Met for Intersection	**No**

Signal Warrants Report For Intersection 7: Pipeline Avenue at Woodview Road

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	No
#2	Four Hour Vehicular Volume	No
#3	Peak Hour	No

Intersection Warrants Parameters

Major Approaches	S, N
Minor Approaches	W
Speed > 40mph	No
Population < 10,000	No
Warrant Factor	100%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets
	S	N	W
1	314	286	200
2	305	277	194
3	298	272	190
4	279	255	178
5	248	226	158
6	245	223	156
7	242	220	154
8	220	200	140
9	217	197	138
10	214	194	136
11	185	169	118
12	173	157	110
13	170	154	108
14	126	114	80
15	126	114	80
16	88	80	56
17	50	46	32
18	50	46	32
19	28	26	18
20	16	14	10
21	9	9	6
22	3	3	2
23	3	3	2
24	3	3	2

Warrant Analysis by Hour

Hour	Major Streets		Minor Street		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	1	600	1	200	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	No	No
2	1	582	1	194	Yes	Yes	Yes	Yes	No	No	Yes	Yes	No	No
3	1	570	1	190	Yes	Yes	Yes	Yes	No	No	Yes	Yes	No	No
4	1	534	1	178	Yes	Yes	Yes	Yes	No	No	Yes	Yes	No	No
5	1	474	1	158	No	Yes	Yes	Yes	No	No	No	Yes	No	No
6	1	468	1	156	No	Yes	Yes	Yes	No	No	No	Yes	No	No
7	1	462	1	154	No	Yes	Yes	Yes	No	No	No	Yes	No	No
8	1	420	1	140	No	Yes	Yes	Yes	No	No	No	Yes	No	No
9	1	414	1	138	No	Yes	Yes	Yes	No	No	No	No	No	No
10	1	408	1	136	No	Yes	Yes	Yes	No	No	No	No	No	No
11	1	354	1	118	No	No	Yes	Yes	No	No	No	No	No	No
12	1	330	1	110	No	No	No	Yes	No	No	No	No	No	No
13	1	324	1	108	No	No	No	Yes	No	No	No	No	No	No
14	1	240	1	80	No	No	No	No	No	No	No	No	No	No
15	1	240	1	80	No	No	No	No	No	No	No	No	No	No
16	1	168	1	56	No	No	No	No	No	No	No	No	No	No
17	1	96	1	32	No	No	No	No	No	No	No	No	No	No
18	1	96	1	32	No	No	No	No	No	No	No	No	No	No
19	1	54	1	18	No	No	No	No	No	No	No	No	No	No
20	1	30	1	10	No	No	No	No	No	No	No	No	No	No
21	1	18	1	6	No	No	No	No	No	No	No	No	No	No
22	1	6	1	2	No	No	No	No	No	No	No	No	No	No
23	1	6	1	2	No	No	No	No	No	No	No	No	No	No
24	1	6	1	2	No	No	No	No	No	No	No	No	No	No
Hours Met					4	10	11	13	0	1	4	8	0	0

Warrant 3 Condition A

Orientation	W
Total Stopped Delay Per Vehicle on Minor Approach (s)	12.6
Number of Lanes on Minor Street Approach	1
VehicleHours of Stopped Delay on Minor Approach ([h]h:mm)	0:42
Delay Condition Met	No
Volume on Minor Street Approach During Same Hour	200
High Minor Volume Condition Met	Yes
Total Entering Volume on All Approaches During Same Hour	800
Number of Approaches on Intersection	3
Total Volume Condition Met	Yes
Warrant Met for Approach	No
Warrant Met for Intersection	**No**

Signal Warrants Report For Intersection 8: Pipeline Avenue at Soquel Canyon Parkway

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	No
#2	Four Hour Vehicular Volume	Yes
#3	Peak Hour	Yes

Intersection Warrants Parameters

Major Approaches	E, W
Minor Approaches	N
Speed > 40mph	Yes
Population < 10,000	No
Warrant Factor	70%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets
	E	W	N
1	339	41	426
2	329	40	413
3	322	39	405
4	302	36	379
5	268	32	337
6	264	32	332
7	261	32	328
8	237	29	298
9	234	28	294
10	231	28	290
11	200	24	251
12	186	23	234
13	183	22	230
14	136	16	170
15	136	16	170
16	95	11	119
17	54	7	68
18	54	7	68
19	31	4	38
20	17	2	21
21	10	1	13
22	3	0	4
23	3	0	4
24	3	0	4

Warrant Analysis by Hour

Hour	Major Streets		Minor Street		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	4	380	1	426	No	No	No	Yes	No	No	No	No	Yes	Yes
2	4	369	1	413	No	No	No	Yes	No	No	No	No	Yes	Yes
3	4	361	1	405	No	No	No	Yes	No	No	No	No	Yes	Yes
4	4	338	1	379	No	No	No	Yes	No	No	No	No	Yes	Yes
5	4	300	1	337	No	No	No	No	No	No	No	No	Yes	No
6	4	296	1	332	No	No	No	No	No	No	No	No	Yes	No
7	4	293	1	328	No	No	No	No	No	No	No	No	Yes	No
8	4	266	1	298	No	No	No	No	No	No	No	No	Yes	No
9	4	262	1	294	No	No	No	No	No	No	No	No	Yes	No
10	4	259	1	290	No	No	No	No	No	No	No	No	Yes	No
11	4	224	1	251	No	No	No	No	No	No	No	No	No	No
12	4	209	1	234	No	No	No	No	No	No	No	No	No	No
13	4	205	1	230	No	No	No	No	No	No	No	No	No	No
14	4	152	1	170	No	No	No	No	No	No	No	No	No	No
15	4	152	1	170	No	No	No	No	No	No	No	No	No	No
16	4	106	1	119	No	No	No	No	No	No	No	No	No	No
17	4	61	1	68	No	No	No	No	No	No	No	No	No	No
18	4	61	1	68	No	No	No	No	No	No	No	No	No	No
19	4	35	1	38	No	No	No	No	No	No	No	No	No	No
20	4	19	1	21	No	No	No	No	No	No	No	No	No	No
21	4	11	1	13	No	No	No	No	No	No	No	No	No	No
22	4	3	1	4	No	No	No	No	No	No	No	No	No	No
23	4	3	1	4	No	No	No	No	No	No	No	No	No	No
24	4	3	1	4	No	No	No	No	No	No	No	No	No	No
Hours Met					0	0	0	4	0	0	0	0	10	4

Warrant 3 Condition A

Orientation	N
Total Stopped Delay Per Vehicle on Minor Approach (s)	22.2
Number of Lanes on Minor Street Approach	1
VehicleHours of Stopped Delay on Minor Approach ([h]h:mm)	2:37
Delay Condition Met	No
Volume on Minor Street Approach During Same Hour	426
High Minor Volume Condition Met	Yes
Total Entering Volume on All Approaches During Same Hour	806
Number of Approaches on Intersection	3
Total Volume Condition Met	Yes
Warrant Met for Approach	No
Warrant Met for Intersection	**No**

Signal Warrants Report For Intersection 12: Carbon Canyon Road at Fairway Drive/Ginseng Lane

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	No
#2	Four Hour Vehicular Volume	No
#3	Peak Hour	No

Intersection Warrants Parameters

Major Approaches	S, N
Minor Approaches	E, W
Speed > 40mph	Yes
Population < 10,000	No
Warrant Factor	70%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets	
	S	N	E	W
1	1237	432	0	28
2	1200	419	0	27
3	1175	410	0	27
4	1101	384	0	25
5	977	341	0	22
6	965	337	0	22
7	952	333	0	22
8	866	302	0	20
9	854	298	0	19
10	841	294	0	19
11	730	255	0	17
12	680	238	0	15
13	668	233	0	15
14	495	173	0	11
15	495	173	0	11
16	346	121	0	8
17	198	69	0	4
18	198	69	0	4
19	111	39	0	3
20	62	22	0	1
21	37	13	0	1
22	12	4	0	0
23	12	4	0	0
24	12	4	0	0

Warrant Analysis by Hour

Hour	Major Streets		Minor Street		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	2	1669	2	28	No	No	No	No	No	No	No	No	No	No
2	2	1619	2	27	No	No	No	No	No	No	No	No	No	No
3	2	1585	2	27	No	No	No	No	No	No	No	No	No	No
4	2	1485	2	25	No	No	No	No	No	No	No	No	No	No
5	2	1318	2	22	No	No	No	No	No	No	No	No	No	No
6	2	1302	2	22	No	No	No	No	No	No	No	No	No	No
7	2	1285	2	22	No	No	No	No	No	No	No	No	No	No
8	2	1168	2	20	No	No	No	No	No	No	No	No	No	No
9	2	1152	2	19	No	No	No	No	No	No	No	No	No	No
10	2	1135	2	19	No	No	No	No	No	No	No	No	No	No
11	2	985	2	17	No	No	No	No	No	No	No	No	No	No
12	2	918	2	15	No	No	No	No	No	No	No	No	No	No
13	2	901	2	15	No	No	No	No	No	No	No	No	No	No
14	2	668	2	11	No	No	No	No	No	No	No	No	No	No
15	2	668	2	11	No	No	No	No	No	No	No	No	No	No
16	2	467	2	8	No	No	No	No	No	No	No	No	No	No
17	2	267	2	4	No	No	No	No	No	No	No	No	No	No
18	2	267	2	4	No	No	No	No	No	No	No	No	No	No
19	2	150	2	3	No	No	No	No	No	No	No	No	No	No
20	2	84	2	1	No	No	No	No	No	No	No	No	No	No
21	2	50	2	1	No	No	No	No	No	No	No	No	No	No
22	2	16	2	0	No	No	No	No	No	No	No	No	No	No
23	2	16	2	0	No	No	No	No	No	No	No	No	No	No
24	2	16	2	0	No	No	No	No	No	No	No	No	No	No
Hours Met					0	0	0	0	0	0	0	0	0	0

Warrant 3 Condition A

Orientation	E	W
Total Stopped Delay Per Vehicle on Minor Approach (s)	42.4	45.9
Number of Lanes on Minor Street Approach	1	2
VehicleHours of Stopped Delay on Minor Approach ([h]h:mm)	0:00	0:21
Delay Condition Met	No	No
Volume on Minor Street Approach During Same Hour	0	28
High Minor Volume Condition Met	No	No
Total Entering Volume on All Approaches During Same Hour	1697	1697
Number of Approaches on Intersection	4	4
Total Volume Condition Met	Yes	Yes
Warrant Met for Approach	No	No
Warrant Met for Intersection	**No**	

Signal Warrants Report For Intersection 13: Carbon Canyon Road at Canyon Hills Road

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	No
#2	Four Hour Vehicular Volume	No
#3	Peak Hour	No

Intersection Warrants Parameters

Major Approaches	S, N
Minor Approaches	W
Speed > 40mph	Yes
Population < 10,000	No
Warrant Factor	70%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets
	S	N	W
1	1234	371	44
2	1197	360	43
3	1172	352	42
4	1098	330	39
5	975	293	35
6	963	289	34
7	950	286	34
8	864	260	31
9	851	256	30
10	839	252	30
11	728	219	26
12	679	204	24
13	666	200	24
14	494	148	18
15	494	148	18
16	346	104	12
17	197	59	7
18	197	59	7
19	111	33	4
20	62	19	2
21	37	11	1
22	12	4	0
23	12	4	0
24	12	4	0

Warrant Analysis by Hour

Hour	Major Streets		Minor Street		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	2	1605	1	44	No	No	No	No	No	No	No	Yes	No	No
2	2	1557	1	43	No	No	No	No	No	No	No	Yes	No	No
3	2	1524	1	42	No	No	No	No	No	No	No	Yes	No	No
4	2	1428	1	39	No	No	No	No	No	No	No	No	No	No
5	2	1268	1	35	No	No	No	No	No	No	No	No	No	No
6	2	1252	1	34	No	No	No	No	No	No	No	No	No	No
7	2	1236	1	34	No	No	No	No	No	No	No	No	No	No
8	2	1124	1	31	No	No	No	No	No	No	No	No	No	No
9	2	1107	1	30	No	No	No	No	No	No	No	No	No	No
10	2	1091	1	30	No	No	No	No	No	No	No	No	No	No
11	2	947	1	26	No	No	No	No	No	No	No	No	No	No
12	2	883	1	24	No	No	No	No	No	No	No	No	No	No
13	2	866	1	24	No	No	No	No	No	No	No	No	No	No
14	2	642	1	18	No	No	No	No	No	No	No	No	No	No
15	2	642	1	18	No	No	No	No	No	No	No	No	No	No
16	2	450	1	12	No	No	No	No	No	No	No	No	No	No
17	2	256	1	7	No	No	No	No	No	No	No	No	No	No
18	2	256	1	7	No	No	No	No	No	No	No	No	No	No
19	2	144	1	4	No	No	No	No	No	No	No	No	No	No
20	2	81	1	2	No	No	No	No	No	No	No	No	No	No
21	2	48	1	1	No	No	No	No	No	No	No	No	No	No
22	2	16	1	0	No	No	No	No	No	No	No	No	No	No
23	2	16	1	0	No	No	No	No	No	No	No	No	No	No
24	2	16	1	0	No	No	No	No	No	No	No	No	No	No
Hours Met					0	0	0	0	0	0	0	3	0	0

Warrant 3 Condition A

Orientation	W
Total Stopped Delay Per Vehicle on Minor Approach (s)	33
Number of Lanes on Minor Street Approach	1
VehicleHours of Stopped Delay on Minor Approach ([h]h:mm)	0:24
Delay Condition Met	No
Volume on Minor Street Approach During Same Hour	44
High Minor Volume Condition Met	No
Total Entering Volume on All Approaches During Same Hour	1649
Number of Approaches on Intersection	3
Total Volume Condition Met	Yes
Warrant Met for Approach	No
Warrant Met for Intersection	**No**

APPENDIX G-II

EXISTING WITH PROJECT TRAFFIC CONDITIONS

Signal Warrants Report For Intersection 7: Pipeline Avenue at Woodview Road

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	Yes
#2	Four Hour Vehicular Volume	Yes
#3	Peak Hour	Yes

Intersection Warrants Parameters

Major Approaches	S, N
Minor Approaches	W
Speed > 40mph	No
Population < 10,000	No
Warrant Factor	100%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets
	S	N	W
1	528	246	220
2	512	239	213
3	502	234	209
4	470	219	196
5	417	194	174
6	412	192	172
7	407	189	169
8	370	172	154
9	364	170	152
10	359	167	150
11	312	145	130
12	290	135	121
13	285	133	119
14	211	98	88
15	211	98	88
16	148	69	62
17	84	39	35
18	84	39	35
19	48	22	20
20	26	12	11
21	16	7	7
22	5	2	2
23	5	2	2
24	5	2	2

Warrant Analysis by Hour

Hour	Major Streets		Minor Street		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	1	774	1	220	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
2	1	751	1	213	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
3	1	736	1	209	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	No
4	1	689	1	196	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	No
5	1	611	1	174	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	No	No
6	1	604	1	172	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	No	No
7	1	596	1	169	Yes	Yes	Yes	Yes	No	No	Yes	Yes	No	No
8	1	542	1	154	Yes	Yes	Yes	Yes	No	No	Yes	Yes	No	No
9	1	534	1	152	Yes	Yes	Yes	Yes	No	No	Yes	Yes	No	No
10	1	526	1	150	Yes	Yes	Yes	Yes	No	No	Yes	Yes	No	No
11	1	457	1	130	No	Yes	Yes	Yes	No	No	No	Yes	No	No
12	1	425	1	121	No	Yes	Yes	Yes	No	No	No	Yes	No	No
13	1	418	1	119	No	No	Yes	Yes	No	No	No	No	No	No
14	1	309	1	88	No	No	No	Yes	No	No	No	No	No	No
15	1	309	1	88	No	No	No	Yes	No	No	No	No	No	No
16	1	217	1	62	No	No	No	No	No	No	No	No	No	No
17	1	123	1	35	No	No	No	No	No	No	No	No	No	No
18	1	123	1	35	No	No	No	No	No	No	No	No	No	No
19	1	70	1	20	No	No	No	No	No	No	No	No	No	No
20	1	38	1	11	No	No	No	No	No	No	No	No	No	No
21	1	23	1	7	No	No	No	No	No	No	No	No	No	No
22	1	7	1	2	No	No	No	No	No	No	No	No	No	No
23	1	7	1	2	No	No	No	No	No	No	No	No	No	No
24	1	7	1	2	No	No	No	No	No	No	No	No	No	No
Hours Met					10	12	13	15	2	6	10	12	4	0

Warrant 3 Condition A

Orientation	W
Total Stopped Delay Per Vehicle on Minor Approach (s)	119.5
Number of Lanes on Minor Street Approach	1
VehicleHours of Stopped Delay on Minor Approach ([h]h:mm)	7:18
Delay Condition Met	Yes
Volume on Minor Street Approach During Same Hour	220
High Minor Volume Condition Met	Yes
Total Entering Volume on All Approaches During Same Hour	994
Number of Approaches on Intersection	3
Total Volume Condition Met	Yes
Warrant Met for Approach	Yes
Warrant Met for Intersection	**Yes**

Signal Warrants Report For Intersection 8: Pipeline Avenue at Soquel Canyon Parkway

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	Yes
#2	Four Hour Vehicular Volume	Yes
#3	Peak Hour	Yes

Intersection Warrants Parameters

Major Approaches	E, W
Minor Approaches	N
Speed > 40mph	Yes
Population < 10,000	No
Warrant Factor	70%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets
	E	W	N
1	542	263	375
2	526	255	364
3	515	250	356
4	482	234	334
5	428	208	296
6	423	205	293
7	417	203	289
8	379	184	263
9	374	181	259
10	369	179	255
11	320	155	221
12	298	145	206
13	293	142	203
14	217	105	150
15	217	105	150
16	152	74	105
17	87	42	60
18	87	42	60
19	49	24	34
20	27	13	19
21	16	8	11
22	5	3	4
23	5	3	4
24	5	3	4

Warrant Analysis by Hour

Hour	Major Streets		Minor Street		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	4	805	1	375	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes
2	4	781	1	364	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes
3	4	765	1	356	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes
4	4	716	1	334	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Yes	Yes
5	4	636	1	296	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Yes	Yes
6	4	628	1	293	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes	Yes
7	4	620	1	289	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes	Yes
8	4	563	1	263	No	Yes	Yes	Yes	No	No	No	Yes	Yes	Yes
9	4	555	1	259	No	Yes	Yes	Yes	No	No	No	Yes	Yes	No
10	4	548	1	255	No	Yes	Yes	Yes	No	No	No	Yes	Yes	No
11	4	475	1	221	No	No	Yes	Yes	No	No	No	No	Yes	No
12	4	443	1	206	No	No	Yes	Yes	No	No	No	No	Yes	No
13	4	435	1	203	No	No	Yes	Yes	No	No	No	No	Yes	No
14	4	322	1	150	No	No	No	No	No	No	No	No	No	No
15	4	322	1	150	No	No	No	No	No	No	No	No	No	No
16	4	226	1	105	No	No	No	No	No	No	No	No	No	No
17	4	129	1	60	No	No	No	No	No	No	No	No	No	No
18	4	129	1	60	No	No	No	No	No	No	No	No	No	No
19	4	73	1	34	No	No	No	No	No	No	No	No	No	No
20	4	40	1	19	No	No	No	No	No	No	No	No	No	No
21	4	24	1	11	No	No	No	No	No	No	No	No	No	No
22	4	8	1	4	No	No	No	No	No	No	No	No	No	No
23	4	8	1	4	No	No	No	No	No	No	No	No	No	No
24	4	8	1	4	No	No	No	No	No	No	No	No	No	No
Hours Met					7	10	13	13	0	3	5	10	13	8

Warrant 3 Condition A

Orientation	N
Total Stopped Delay Per Vehicle on Minor Approach (s)	55
Number of Lanes on Minor Street Approach	1
VehicleHours of Stopped Delay on Minor Approach ([h]h:mm)	5:43
Delay Condition Met	Yes
Volume on Minor Street Approach During Same Hour	375
High Minor Volume Condition Met	Yes
Total Entering Volume on All Approaches During Same Hour	1180
Number of Approaches on Intersection	3
Total Volume Condition Met	Yes
Warrant Met for Approach	Yes
Warrant Met for Intersection	**Yes**

Signal Warrants Report For Intersection 12: Carbon Canyon Road at Fairway Drive/Ginseng Lane

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	No
#2	Four Hour Vehicular Volume	No
#3	Peak Hour	No

Intersection Warrants Parameters

Major Approaches	S, N
Minor Approaches	E, W
Speed > 40mph	Yes
Population < 10,000	No
Warrant Factor	70%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets	
	S	N	E	W
1	405	1361	0	61
2	393	1320	0	59
3	385	1293	0	58
4	360	1211	0	54
5	320	1075	0	48
6	316	1062	0	48
7	312	1048	0	47
8	284	953	0	43
9	279	939	0	42
10	275	925	0	41
11	239	803	0	36
12	223	749	0	34
13	219	735	0	33
14	162	544	0	24
15	162	544	0	24
16	113	381	0	17
17	65	218	0	10
18	65	218	0	10
19	36	122	0	5
20	20	68	0	3
21	12	41	0	2
22	4	14	0	1
23	4	14	0	1
24	4	14	0	1

Warrant Analysis by Hour

Hour	Major Streets		Minor Street		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	2	1766	2	61	No	No	No	No	No	No	No	Yes	No	No
2	2	1713	2	59	No	No	No	No	No	No	No	Yes	No	No
3	2	1678	2	58	No	No	No	No	No	No	No	Yes	No	No
4	2	1571	2	54	No	No	No	No	No	No	No	No	No	No
5	2	1395	2	48	No	No	No	No	No	No	No	No	No	No
6	2	1378	2	48	No	No	No	No	No	No	No	No	No	No
7	2	1360	2	47	No	No	No	No	No	No	No	No	No	No
8	2	1237	2	43	No	No	No	No	No	No	No	No	No	No
9	2	1218	2	42	No	No	No	No	No	No	No	No	No	No
10	2	1200	2	41	No	No	No	No	No	No	No	No	No	No
11	2	1042	2	36	No	No	No	No	No	No	No	No	No	No
12	2	972	2	34	No	No	No	No	No	No	No	No	No	No
13	2	954	2	33	No	No	No	No	No	No	No	No	No	No
14	2	706	2	24	No	No	No	No	No	No	No	No	No	No
15	2	706	2	24	No	No	No	No	No	No	No	No	No	No
16	2	494	2	17	No	No	No	No	No	No	No	No	No	No
17	2	283	2	10	No	No	No	No	No	No	No	No	No	No
18	2	283	2	10	No	No	No	No	No	No	No	No	No	No
19	2	158	2	5	No	No	No	No	No	No	No	No	No	No
20	2	88	2	3	No	No	No	No	No	No	No	No	No	No
21	2	53	2	2	No	No	No	No	No	No	No	No	No	No
22	2	18	2	1	No	No	No	No	No	No	No	No	No	No
23	2	18	2	1	No	No	No	No	No	No	No	No	No	No
24	2	18	2	1	No	No	No	No	No	No	No	No	No	No
Hours Met					0	0	0	0	0	0	0	3	0	0

Warrant 3 Condition A

Orientation	E	W
Total Stopped Delay Per Vehicle on Minor Approach (s)	54.7	105.7
Number of Lanes on Minor Street Approach	1	2
VehicleHours of Stopped Delay on Minor Approach ([h]h:mm)	0:00	1:47
Delay Condition Met	No	No
Volume on Minor Street Approach During Same Hour	0	61
High Minor Volume Condition Met	No	No
Total Entering Volume on All Approaches During Same Hour	1827	1827
Number of Approaches on Intersection	4	4
Total Volume Condition Met	Yes	Yes
Warrant Met for Approach	No	No
Warrant Met for Intersection	**No**	

Signal Warrants Report For Intersection 13: Carbon Canyon Road at Canyon Hills Road

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	No
#2	Four Hour Vehicular Volume	No
#3	Peak Hour	No

Intersection Warrants Parameters

Major Approaches	S, N
Minor Approaches	W
Speed > 40mph	Yes
Population < 10,000	No
Warrant Factor	70%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets
	S	N	W
1	309	1355	65
2	300	1314	63
3	294	1287	62
4	275	1206	58
5	244	1070	51
6	241	1057	51
7	238	1043	50
8	216	948	46
9	213	935	45
10	210	921	44
11	182	799	38
12	170	745	36
13	167	732	35
14	124	542	26
15	124	542	26
16	87	379	18
17	49	217	10
18	49	217	10
19	28	122	6
20	15	68	3
21	9	41	2
22	3	14	1
23	3	14	1
24	3	14	1

Warrant Analysis by Hour

Hour	Major Streets		Minor Street		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	2	1664	1	65	No	No	No	No	No	Yes	Yes	Yes	Yes	No
2	2	1614	1	63	No	No	No	No	No	Yes	Yes	Yes	Yes	No
3	2	1581	1	62	No	No	No	No	No	Yes	Yes	Yes	Yes	No
4	2	1481	1	58	No	No	No	No	No	No	Yes	Yes	No	No
5	2	1314	1	51	No	No	No	No	No	No	No	Yes	No	No
6	2	1298	1	51	No	No	No	No	No	No	No	Yes	No	No
7	2	1281	1	50	No	No	No	No	No	No	No	Yes	No	No
8	2	1164	1	46	No	No	No	No	No	No	No	Yes	No	No
9	2	1148	1	45	No	No	No	No	No	No	No	Yes	No	No
10	2	1131	1	44	No	No	No	No	No	No	No	Yes	No	No
11	2	981	1	38	No	No	No	No	No	No	No	No	No	No
12	2	915	1	36	No	No	No	No	No	No	No	No	No	No
13	2	899	1	35	No	No	No	No	No	No	No	No	No	No
14	2	666	1	26	No	No	No	No	No	No	No	No	No	No
15	2	666	1	26	No	No	No	No	No	No	No	No	No	No
16	2	466	1	18	No	No	No	No	No	No	No	No	No	No
17	2	266	1	10	No	No	No	No	No	No	No	No	No	No
18	2	266	1	10	No	No	No	No	No	No	No	No	No	No
19	2	150	1	6	No	No	No	No	No	No	No	No	No	No
20	2	83	1	3	No	No	No	No	No	No	No	No	No	No
21	2	50	1	2	No	No	No	No	No	No	No	No	No	No
22	2	17	1	1	No	No	No	No	No	No	No	No	No	No
23	2	17	1	1	No	No	No	No	No	No	No	No	No	No
24	2	17	1	1	No	No	No	No	No	No	No	No	No	No
Hours Met					0	0	0	0	0	3	4	10	3	0

Warrant 3 Condition A

Orientation	W
Total Stopped Delay Per Vehicle on Minor Approach (s)	66.9
Number of Lanes on Minor Street Approach	1
VehicleHours of Stopped Delay on Minor Approach ([h]h:mm)	1:12
Delay Condition Met	No
Volume on Minor Street Approach During Same Hour	65
High Minor Volume Condition Met	No
Total Entering Volume on All Approaches During Same Hour	1729
Number of Approaches on Intersection	3
Total Volume Condition Met	Yes
Warrant Met for Approach	No
Warrant Met for Intersection	**No**

Signal Warrants Report For Intersection 7: Pipeline Avenue at Woodview Road

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	No
#2	Four Hour Vehicular Volume	No
#3	Peak Hour	No

Intersection Warrants Parameters

Major Approaches	S, N
Minor Approaches	W
Speed > 40mph	No
Population < 10,000	No
Warrant Factor	100%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets
	S	N	W
1	354	420	191
2	343	407	185
3	336	399	181
4	315	374	170
5	280	332	151
6	276	328	149
7	273	323	147
8	248	294	134
9	244	290	132
10	241	286	130
11	209	248	113
12	195	231	105
13	191	227	103
14	142	168	76
15	142	168	76
16	99	118	53
17	57	67	31
18	57	67	31
19	32	38	17
20	18	21	10
21	11	13	6
22	4	4	2
23	4	4	2
24	4	4	2

Warrant Analysis by Hour

Hour	Major Streets		Minor Street		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	1	774	1	191	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
2	1	750	1	185	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
3	1	735	1	181	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	No
4	1	689	1	170	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	No	No
5	1	612	1	151	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	No	No
6	1	604	1	149	No	Yes	Yes	Yes	No	Yes	Yes	Yes	No	No
7	1	596	1	147	No	Yes	Yes	Yes	No	No	Yes	Yes	No	No
8	1	542	1	134	No	Yes	Yes	Yes	No	No	Yes	Yes	No	No
9	1	534	1	132	No	Yes	Yes	Yes	No	No	Yes	Yes	No	No
10	1	527	1	130	No	Yes	Yes	Yes	No	No	Yes	Yes	No	No
11	1	457	1	113	No	No	Yes	Yes	No	No	No	Yes	No	No
12	1	426	1	105	No	No	Yes	Yes	No	No	No	Yes	No	No
13	1	418	1	103	No	No	No	Yes	No	No	No	No	No	No
14	1	310	1	76	No	No	No	No	No	No	No	No	No	No
15	1	310	1	76	No	No	No	No	No	No	No	No	No	No
16	1	217	1	53	No	No	No	No	No	No	No	No	No	No
17	1	124	1	31	No	No	No	No	No	No	No	No	No	No
18	1	124	1	31	No	No	No	No	No	No	No	No	No	No
19	1	70	1	17	No	No	No	No	No	No	No	No	No	No
20	1	39	1	10	No	No	No	No	No	No	No	No	No	No
21	1	24	1	6	No	No	No	No	No	No	No	No	No	No
22	1	8	1	2	No	No	No	No	No	No	No	No	No	No
23	1	8	1	2	No	No	No	No	No	No	No	No	No	No
24	1	8	1	2	No	No	No	No	No	No	No	No	No	No
Hours Met					5	10	12	13	2	6	10	12	3	0

Warrant 3 Condition A

Orientation	W
Total Stopped Delay Per Vehicle on Minor Approach (s)	17.4
Number of Lanes on Minor Street Approach	1
VehicleHours of Stopped Delay on Minor Approach ([h]h:mm)	0:55
Delay Condition Met	No
Volume on Minor Street Approach During Same Hour	191
High Minor Volume Condition Met	Yes
Total Entering Volume on All Approaches During Same Hour	965
Number of Approaches on Intersection	3
Total Volume Condition Met	Yes
Warrant Met for Approach	No
Warrant Met for Intersection	**No**

Signal Warrants Report For Intersection 8: Pipeline Avenue at Soquel Canyon Parkway

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	Yes
#2	Four Hour Vehicular Volume	Yes
#3	Peak Hour	Yes

Intersection Warrants Parameters

Major Approaches	E, W
Minor Approaches	N
Speed > 40mph	Yes
Population < 10,000	No
Warrant Factor	70%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets
	E	W	N
1	498	198	392
2	483	192	380
3	473	188	372
4	443	176	349
5	393	156	310
6	388	154	306
7	383	152	302
8	349	139	274
9	344	137	270
10	339	135	267
11	294	117	231
12	274	109	216
13	269	107	212
14	199	79	157
15	199	79	157
16	139	55	110
17	80	32	63
18	80	32	63
19	45	18	35
20	25	10	20
21	15	6	12
22	5	2	4
23	5	2	4
24	5	2	4

Warrant Analysis by Hour

Hour	Major Streets		Minor Street		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	4	696	1	392	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Yes	Yes
2	4	675	1	380	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Yes	Yes
3	4	661	1	372	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Yes	Yes
4	4	619	1	349	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes	Yes
5	4	549	1	310	No	Yes	Yes	Yes	No	No	No	Yes	Yes	Yes
6	4	542	1	306	No	Yes	Yes	Yes	No	No	No	Yes	Yes	Yes
7	4	535	1	302	No	Yes	Yes	Yes	No	No	No	Yes	Yes	Yes
8	4	488	1	274	No	Yes	Yes	Yes	No	No	No	No	Yes	No
9	4	481	1	270	No	Yes	Yes	Yes	No	No	No	No	Yes	No
10	4	474	1	267	No	No	Yes	Yes	No	No	No	No	Yes	No
11	4	411	1	231	No	No	No	Yes	No	No	No	No	Yes	No
12	4	383	1	216	No	No	No	Yes	No	No	No	No	No	No
13	4	376	1	212	No	No	No	Yes	No	No	No	No	No	No
14	4	278	1	157	No	No	No	No	No	No	No	No	No	No
15	4	278	1	157	No	No	No	No	No	No	No	No	No	No
16	4	194	1	110	No	No	No	No	No	No	No	No	No	No
17	4	112	1	63	No	No	No	No	No	No	No	No	No	No
18	4	112	1	63	No	No	No	No	No	No	No	No	No	No
19	4	63	1	35	No	No	No	No	No	No	No	No	No	No
20	4	35	1	20	No	No	No	No	No	No	No	No	No	No
21	4	21	1	12	No	No	No	No	No	No	No	No	No	No
22	4	7	1	4	No	No	No	No	No	No	No	No	No	No
23	4	7	1	4	No	No	No	No	No	No	No	No	No	No
24	4	7	1	4	No	No	No	No	No	No	No	No	No	No
Hours Met					4	9	10	13	0	0	3	7	11	7

Warrant 3 Condition A

Orientation	N
Total Stopped Delay Per Vehicle on Minor Approach (s)	23.1
Number of Lanes on Minor Street Approach	1
VehicleHours of Stopped Delay on Minor Approach ([h]h:mm)	2:31
Delay Condition Met	No
Volume on Minor Street Approach During Same Hour	392
High Minor Volume Condition Met	Yes
Total Entering Volume on All Approaches During Same Hour	1088
Number of Approaches on Intersection	3
Total Volume Condition Met	Yes
Warrant Met for Approach	No
Warrant Met for Intersection	**No**

Signal Warrants Report For Intersection 12: Carbon Canyon Road at Fairway Drive/Ginseng Lane

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	No
#2	Four Hour Vehicular Volume	No
#3	Peak Hour	No

Intersection Warrants Parameters

Major Approaches	S, N
Minor Approaches	E, W
Speed > 40mph	Yes
Population < 10,000	No
Warrant Factor	70%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets	
	S	N	E	W
1	1365	524	0	56
2	1324	508	0	54
3	1297	498	0	53
4	1215	466	0	50
5	1078	414	0	44
6	1065	409	0	44
7	1051	403	0	43
8	955	367	0	39
9	942	362	0	39
10	928	356	0	38
11	805	309	0	33
12	751	288	0	31
13	737	283	0	30
14	546	210	0	22
15	546	210	0	22
16	382	147	0	16
17	218	84	0	9
18	218	84	0	9
19	123	47	0	5
20	68	26	0	3
21	41	16	0	2
22	14	5	0	1
23	14	5	0	1
24	14	5	0	1

Warrant Analysis by Hour

Hour	Major Streets		Minor Street		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	2	1889	2	56	No	No	No	No	No	No	No	Yes	No	No
2	2	1832	2	54	No	No	No	No	No	No	No	No	No	No
3	2	1795	2	53	No	No	No	No	No	No	No	No	No	No
4	2	1681	2	50	No	No	No	No	No	No	No	No	No	No
5	2	1492	2	44	No	No	No	No	No	No	No	No	No	No
6	2	1474	2	44	No	No	No	No	No	No	No	No	No	No
7	2	1454	2	43	No	No	No	No	No	No	No	No	No	No
8	2	1322	2	39	No	No	No	No	No	No	No	No	No	No
9	2	1304	2	39	No	No	No	No	No	No	No	No	No	No
10	2	1284	2	38	No	No	No	No	No	No	No	No	No	No
11	2	1114	2	33	No	No	No	No	No	No	No	No	No	No
12	2	1039	2	31	No	No	No	No	No	No	No	No	No	No
13	2	1020	2	30	No	No	No	No	No	No	No	No	No	No
14	2	756	2	22	No	No	No	No	No	No	No	No	No	No
15	2	756	2	22	No	No	No	No	No	No	No	No	No	No
16	2	529	2	16	No	No	No	No	No	No	No	No	No	No
17	2	302	2	9	No	No	No	No	No	No	No	No	No	No
18	2	302	2	9	No	No	No	No	No	No	No	No	No	No
19	2	170	2	5	No	No	No	No	No	No	No	No	No	No
20	2	94	2	3	No	No	No	No	No	No	No	No	No	No
21	2	57	2	2	No	No	No	No	No	No	No	No	No	No
22	2	19	2	1	No	No	No	No	No	No	No	No	No	No
23	2	19	2	1	No	No	No	No	No	No	No	No	No	No
24	2	19	2	1	No	No	No	No	No	No	No	No	No	No
Hours Met					0	0	0	0	0	0	0	1	0	0

Warrant 3 Condition A

Orientation	E	W
Total Stopped Delay Per Vehicle on Minor Approach (s)	59.7	107.5
Number of Lanes on Minor Street Approach	1	2
VehicleHours of Stopped Delay on Minor Approach ([h]h:mm)	0:00	1:40
Delay Condition Met	No	No
Volume on Minor Street Approach During Same Hour	0	56
High Minor Volume Condition Met	No	No
Total Entering Volume on All Approaches During Same Hour	1945	1945
Number of Approaches on Intersection	4	4
Total Volume Condition Met	Yes	Yes
Warrant Met for Approach	No	No
Warrant Met for Intersection	**No**	

Signal Warrants Report For Intersection 13: Carbon Canyon Road at Canyon Hills Road

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	No
#2	Four Hour Vehicular Volume	No
#3	Peak Hour	No

Intersection Warrants Parameters

Major Approaches	S, N
Minor Approaches	W
Speed > 40mph	Yes
Population < 10,000	No
Warrant Factor	70%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets
	S	N	W
1	1362	451	44
2	1321	437	43
3	1294	428	42
4	1212	401	39
5	1076	356	35
6	1062	352	34
7	1049	347	34
8	953	316	31
9	940	311	30
10	926	307	30
11	804	266	26
12	749	248	24
13	735	244	24
14	545	180	18
15	545	180	18
16	381	126	12
17	218	72	7
18	218	72	7
19	123	41	4
20	68	23	2
21	41	14	1
22	14	5	0
23	14	5	0
24	14	5	0

Warrant Analysis by Hour

Hour	Major Streets		Minor Street		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	2	1813	1	44	No	No	No	No	No	No	No	Yes	No	No
2	2	1758	1	43	No	No	No	No	No	No	No	Yes	No	No
3	2	1722	1	42	No	No	No	No	No	No	No	Yes	No	No
4	2	1613	1	39	No	No	No	No	No	No	No	No	No	No
5	2	1432	1	35	No	No	No	No	No	No	No	No	No	No
6	2	1414	1	34	No	No	No	No	No	No	No	No	No	No
7	2	1396	1	34	No	No	No	No	No	No	No	No	No	No
8	2	1269	1	31	No	No	No	No	No	No	No	No	No	No
9	2	1251	1	30	No	No	No	No	No	No	No	No	No	No
10	2	1233	1	30	No	No	No	No	No	No	No	No	No	No
11	2	1070	1	26	No	No	No	No	No	No	No	No	No	No
12	2	997	1	24	No	No	No	No	No	No	No	No	No	No
13	2	979	1	24	No	No	No	No	No	No	No	No	No	No
14	2	725	1	18	No	No	No	No	No	No	No	No	No	No
15	2	725	1	18	No	No	No	No	No	No	No	No	No	No
16	2	507	1	12	No	No	No	No	No	No	No	No	No	No
17	2	290	1	7	No	No	No	No	No	No	No	No	No	No
18	2	290	1	7	No	No	No	No	No	No	No	No	No	No
19	2	164	1	4	No	No	No	No	No	No	No	No	No	No
20	2	91	1	2	No	No	No	No	No	No	No	No	No	No
21	2	55	1	1	No	No	No	No	No	No	No	No	No	No
22	2	19	1	0	No	No	No	No	No	No	No	No	No	No
23	2	19	1	0	No	No	No	No	No	No	No	No	No	No
24	2	19	1	0	No	No	No	No	No	No	No	No	No	No
Hours Met					0	0	0	0	0	0	0	3	0	0

Warrant 3 Condition A

Orientation	W
Total Stopped Delay Per Vehicle on Minor Approach (s)	47
Number of Lanes on Minor Street Approach	1
VehicleHours of Stopped Delay on Minor Approach ([h]h:mm)	0:34
Delay Condition Met	No
Volume on Minor Street Approach During Same Hour	44
High Minor Volume Condition Met	No
Total Entering Volume on All Approaches During Same Hour	1857
Number of Approaches on Intersection	3
Total Volume Condition Met	Yes
Warrant Met for Approach	No
Warrant Met for Intersection	**No**

APPENDIX G-III

YEAR 2029 WITHOUT PROJECT TRAFFIC CONDITIONS

Signal Warrants Report For Intersection 7: Pipeline Avenue at Woodview Road

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	Yes
#2	Four Hour Vehicular Volume	Yes
#3	Peak Hour	Yes

Intersection Warrants Parameters

Major Approaches	S, N
Minor Approaches	W
Speed > 40mph	No
Population < 10,000	No
Warrant Factor	100%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets
	S	N	W
1	645	288	359
2	626	279	348
3	613	274	341
4	574	256	320
5	510	228	284
6	503	225	280
7	497	222	276
8	451	202	251
9	445	199	248
10	439	196	244
11	381	170	212
12	355	158	197
13	348	156	194
14	258	115	144
15	258	115	144
16	181	81	101
17	103	46	57
18	103	46	57
19	58	26	32
20	32	14	18
21	19	9	11
22	6	3	4
23	6	3	4
24	6	3	4

Warrant Analysis by Hour

Hour	Major Streets		Minor Street		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	1	933	1	359	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
2	1	905	1	348	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
3	1	887	1	341	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
4	1	830	1	320	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
5	1	738	1	284	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	No
6	1	728	1	280	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	No
7	1	719	1	276	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	No
8	1	653	1	251	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	No
9	1	644	1	248	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	No
10	1	635	1	244	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	No
11	1	551	1	212	Yes	Yes	Yes	Yes	No	No	Yes	Yes	No	No
12	1	513	1	197	Yes	Yes	Yes	Yes	No	No	No	Yes	No	No
13	1	504	1	194	Yes	Yes	Yes	Yes	No	No	No	Yes	No	No
14	1	373	1	144	No	No	Yes	Yes	No	No	No	No	No	No
15	1	373	1	144	No	No	Yes	Yes	No	No	No	No	No	No
16	1	262	1	101	No	No	No	No	No	No	No	No	No	No
17	1	149	1	57	No	No	No	No	No	No	No	No	No	No
18	1	149	1	57	No	No	No	No	No	No	No	No	No	No
19	1	84	1	32	No	No	No	No	No	No	No	No	No	No
20	1	46	1	18	No	No	No	No	No	No	No	No	No	No
21	1	28	1	11	No	No	No	No	No	No	No	No	No	No
22	1	9	1	4	No	No	No	No	No	No	No	No	No	No
23	1	9	1	4	No	No	No	No	No	No	No	No	No	No
24	1	9	1	4	No	No	No	No	No	No	No	No	No	No
Hours Met					13	13	15	15	4	10	11	13	10	3

Warrant 3 Condition A

Orientation	W
Total Stopped Delay Per Vehicle on Minor Approach (s)	66.7
Number of Lanes on Minor Street Approach	1
VehicleHours of Stopped Delay on Minor Approach ([h]h:mm)	6:39
Delay Condition Met	Yes
Volume on Minor Street Approach During Same Hour	359
High Minor Volume Condition Met	Yes
Total Entering Volume on All Approaches During Same Hour	1292
Number of Approaches on Intersection	3
Total Volume Condition Met	Yes
Warrant Met for Approach	Yes
Warrant Met for Intersection	**Yes**

Signal Warrants Report For Intersection 12: Carbon Canyon Road at Fairway Drive/Ginseng Lane

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	No
#2	Four Hour Vehicular Volume	No
#3	Peak Hour	No

Intersection Warrants Parameters

Major Approaches	S, N
Minor Approaches	E, W
Speed > 40mph	Yes
Population < 10,000	No
Warrant Factor	70%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets	
	S	N	E	W
1	503	1460	0	8
2	488	1416	0	8
3	478	1387	0	8
4	448	1299	0	7
5	397	1153	0	6
6	392	1139	0	6
7	387	1124	0	6
8	352	1022	0	6
9	347	1007	0	6
10	342	993	0	5
11	297	861	0	5
12	277	803	0	4
13	272	788	0	4
14	201	584	0	3
15	201	584	0	3
16	141	409	0	2
17	80	234	0	1
18	80	234	0	1
19	45	131	0	1
20	25	73	0	0
21	15	44	0	0
22	5	15	0	0
23	5	15	0	0
24	5	15	0	0

Warrant Analysis by Hour

Hour	Major Streets		Minor Street		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	2	1963	2	8	No	No	No	No	No	No	No	No	No	No
2	2	1904	2	8	No	No	No	No	No	No	No	No	No	No
3	2	1865	2	8	No	No	No	No	No	No	No	No	No	No
4	2	1747	2	7	No	No	No	No	No	No	No	No	No	No
5	2	1550	2	6	No	No	No	No	No	No	No	No	No	No
6	2	1531	2	6	No	No	No	No	No	No	No	No	No	No
7	2	1511	2	6	No	No	No	No	No	No	No	No	No	No
8	2	1374	2	6	No	No	No	No	No	No	No	No	No	No
9	2	1354	2	6	No	No	No	No	No	No	No	No	No	No
10	2	1335	2	5	No	No	No	No	No	No	No	No	No	No
11	2	1158	2	5	No	No	No	No	No	No	No	No	No	No
12	2	1080	2	4	No	No	No	No	No	No	No	No	No	No
13	2	1060	2	4	No	No	No	No	No	No	No	No	No	No
14	2	785	2	3	No	No	No	No	No	No	No	No	No	No
15	2	785	2	3	No	No	No	No	No	No	No	No	No	No
16	2	550	2	2	No	No	No	No	No	No	No	No	No	No
17	2	314	2	1	No	No	No	No	No	No	No	No	No	No
18	2	314	2	1	No	No	No	No	No	No	No	No	No	No
19	2	176	2	1	No	No	No	No	No	No	No	No	No	No
20	2	98	2	0	No	No	No	No	No	No	No	No	No	No
21	2	59	2	0	No	No	No	No	No	No	No	No	No	No
22	2	20	2	0	No	No	No	No	No	No	No	No	No	No
23	2	20	2	0	No	No	No	No	No	No	No	No	No	No
24	2	20	2	0	No	No	No	No	No	No	No	No	No	No
Hours Met					0	0	0	0	0	0	0	0	0	0

Warrant 3 Condition A

Orientation	E	W
Total Stopped Delay Per Vehicle on Minor Approach (s)	63.5	70.9
Number of Lanes on Minor Street Approach	1	2
VehicleHours of Stopped Delay on Minor Approach ([h]h:mm)	0:00	0:09
Delay Condition Met	No	No
Volume on Minor Street Approach During Same Hour	0	8
High Minor Volume Condition Met	No	No
Total Entering Volume on All Approaches During Same Hour	1971	1971
Number of Approaches on Intersection	4	4
Total Volume Condition Met	Yes	Yes
Warrant Met for Approach	No	No
Warrant Met for Intersection	**No**	

Signal Warrants Report For Intersection 13: Carbon Canyon Road at Canyon Hills Road

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	Yes
#2	Four Hour Vehicular Volume	Yes
#3	Peak Hour	Yes

Intersection Warrants Parameters

Major Approaches	S, N
Minor Approaches	W
Speed > 40mph	Yes
Population < 10,000	No
Warrant Factor	70%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets
	S	N	W
1	384	1436	99
2	372	1393	96
3	365	1364	94
4	342	1278	88
5	303	1134	78
6	300	1120	77
7	296	1106	76
8	269	1005	69
9	265	991	68
10	261	976	67
11	227	847	58
12	211	790	54
13	207	775	53
14	154	574	40
15	154	574	40
16	108	402	28
17	61	230	16
18	61	230	16
19	35	129	9
20	19	72	5
21	12	43	3
22	4	14	1
23	4	14	1
24	4	14	1

Warrant Analysis by Hour

Hour	Major Streets		Minor Street		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	2	1820	1	99	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
2	2	1765	1	96	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
3	2	1729	1	94	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
4	2	1620	1	88	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
5	2	1437	1	78	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes
6	2	1420	1	77	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes
7	2	1402	1	76	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes
8	2	1274	1	69	No	No	No	No	No	Yes	Yes	Yes	Yes	No
9	2	1256	1	68	No	No	No	No	No	Yes	Yes	Yes	Yes	No
10	2	1237	1	67	No	No	No	No	No	Yes	Yes	Yes	Yes	No
11	2	1074	1	58	No	No	No	No	No	No	Yes	Yes	No	No
12	2	1001	1	54	No	No	No	No	No	No	Yes	Yes	No	No
13	2	982	1	53	No	No	No	No	No	No	Yes	Yes	No	No
14	2	728	1	40	No	No	No	No	No	No	No	No	No	No
15	2	728	1	40	No	No	No	No	No	No	No	No	No	No
16	2	510	1	28	No	No	No	No	No	No	No	No	No	No
17	2	291	1	16	No	No	No	No	No	No	No	No	No	No
18	2	291	1	16	No	No	No	No	No	No	No	No	No	No
19	2	164	1	9	No	No	No	No	No	No	No	No	No	No
20	2	91	1	5	No	No	No	No	No	No	No	No	No	No
21	2	55	1	3	No	No	No	No	No	No	No	No	No	No
22	2	18	1	1	No	No	No	No	No	No	No	No	No	No
23	2	18	1	1	No	No	No	No	No	No	No	No	No	No
24	2	18	1	1	No	No	No	No	No	No	No	No	No	No
Hours Met					0	0	0	4	7	10	13	13	10	7

Warrant 3 Condition A

Orientation	W
Total Stopped Delay Per Vehicle on Minor Approach (s)	203
Number of Lanes on Minor Street Approach	1
VehicleHours of Stopped Delay on Minor Approach ([h]h:mm)	5:34
Delay Condition Met	Yes
Volume on Minor Street Approach During Same Hour	99
High Minor Volume Condition Met	No
Total Entering Volume on All Approaches During Same Hour	1919
Number of Approaches on Intersection	3
Total Volume Condition Met	Yes
Warrant Met for Approach	No
Warrant Met for Intersection	**No**

Signal Warrants Report For Intersection 7: Pipeline Avenue at Woodview Road

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	Yes
#2	Four Hour Vehicular Volume	Yes
#3	Peak Hour	No

Intersection Warrants Parameters

Major Approaches	S, N
Minor Approaches	W
Speed > 40mph	No
Population < 10,000	No
Warrant Factor	100%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets
	S	N	W
1	463	394	293
2	449	382	284
3	440	374	278
4	412	351	261
5	366	311	231
6	361	307	229
7	357	303	226
8	324	276	205
9	319	272	202
10	315	268	199
11	273	232	173
12	255	217	161
13	250	213	158
14	185	158	117
15	185	158	117
16	130	110	82
17	74	63	47
18	74	63	47
19	42	35	26
20	23	20	15
21	14	12	9
22	5	4	3
23	5	4	3
24	5	4	3

Warrant Analysis by Hour

Hour	Major Streets		Minor Street		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	1	857	1	293	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
2	1	831	1	284	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
3	1	814	1	278	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
4	1	763	1	261	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
5	1	677	1	231	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	No
6	1	668	1	229	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	No
7	1	660	1	226	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	No
8	1	600	1	205	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	No	No
9	1	591	1	202	Yes	Yes	Yes	Yes	No	No	Yes	Yes	No	No
10	1	583	1	199	Yes	Yes	Yes	Yes	No	No	Yes	Yes	No	No
11	1	505	1	173	Yes	Yes	Yes	Yes	No	No	No	Yes	No	No
12	1	472	1	161	No	Yes	Yes	Yes	No	No	No	Yes	No	No
13	1	463	1	158	No	Yes	Yes	Yes	No	No	No	Yes	No	No
14	1	343	1	117	No	No	No	Yes	No	No	No	No	No	No
15	1	343	1	117	No	No	No	Yes	No	No	No	No	No	No
16	1	240	1	82	No	No	No	No	No	No	No	No	No	No
17	1	137	1	47	No	No	No	No	No	No	No	No	No	No
18	1	137	1	47	No	No	No	No	No	No	No	No	No	No
19	1	77	1	26	No	No	No	No	No	No	No	No	No	No
20	1	43	1	15	No	No	No	No	No	No	No	No	No	No
21	1	26	1	9	No	No	No	No	No	No	No	No	No	No
22	1	9	1	3	No	No	No	No	No	No	No	No	No	No
23	1	9	1	3	No	No	No	No	No	No	No	No	No	No
24	1	9	1	3	No	No	No	No	No	No	No	No	No	No
Hours Met					11	13	13	15	4	8	10	13	7	0

Warrant 3 Condition A

Orientation	W
Total Stopped Delay Per Vehicle on Minor Approach (s)	27.1
Number of Lanes on Minor Street Approach	1
VehicleHours of Stopped Delay on Minor Approach ([h]h:mm)	2:12
Delay Condition Met	No
Volume on Minor Street Approach During Same Hour	293
High Minor Volume Condition Met	Yes
Total Entering Volume on All Approaches During Same Hour	1150
Number of Approaches on Intersection	3
Total Volume Condition Met	Yes
Warrant Met for Approach	No
Warrant Met for Intersection	**No**

Signal Warrants Report For Intersection 12: Carbon Canyon Road at Fairway Drive/Ginseng Lane

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	No
#2	Four Hour Vehicular Volume	No
#3	Peak Hour	No

Intersection Warrants Parameters

Major Approaches	S, N
Minor Approaches	E, W
Speed > 40mph	Yes
Population < 10,000	No
Warrant Factor	70%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets	
	S	N	E	W
1	1487	593	0	31
2	1442	575	0	30
3	1413	563	0	29
4	1323	528	0	28
5	1175	468	0	24
6	1160	463	0	24
7	1145	457	0	24
8	1041	415	0	22
9	1026	409	0	21
10	1011	403	0	21
11	877	350	0	18
12	818	326	0	17
13	803	320	0	17
14	595	237	0	12
15	595	237	0	12
16	416	166	0	9
17	238	95	0	5
18	238	95	0	5
19	134	53	0	3
20	74	30	0	2
21	45	18	0	1
22	15	6	0	0
23	15	6	0	0
24	15	6	0	0

Warrant Analysis by Hour

Hour	Major Streets		Minor Street		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	2	2080	2	31	No	No	No	No	No	No	No	No	No	No
2	2	2017	2	30	No	No	No	No	No	No	No	No	No	No
3	2	1976	2	29	No	No	No	No	No	No	No	No	No	No
4	2	1851	2	28	No	No	No	No	No	No	No	No	No	No
5	2	1643	2	24	No	No	No	No	No	No	No	No	No	No
6	2	1623	2	24	No	No	No	No	No	No	No	No	No	No
7	2	1602	2	24	No	No	No	No	No	No	No	No	No	No
8	2	1456	2	22	No	No	No	No	No	No	No	No	No	No
9	2	1435	2	21	No	No	No	No	No	No	No	No	No	No
10	2	1414	2	21	No	No	No	No	No	No	No	No	No	No
11	2	1227	2	18	No	No	No	No	No	No	No	No	No	No
12	2	1144	2	17	No	No	No	No	No	No	No	No	No	No
13	2	1123	2	17	No	No	No	No	No	No	No	No	No	No
14	2	832	2	12	No	No	No	No	No	No	No	No	No	No
15	2	832	2	12	No	No	No	No	No	No	No	No	No	No
16	2	582	2	9	No	No	No	No	No	No	No	No	No	No
17	2	333	2	5	No	No	No	No	No	No	No	No	No	No
18	2	333	2	5	No	No	No	No	No	No	No	No	No	No
19	2	187	2	3	No	No	No	No	No	No	No	No	No	No
20	2	104	2	2	No	No	No	No	No	No	No	No	No	No
21	2	63	2	1	No	No	No	No	No	No	No	No	No	No
22	2	21	2	0	No	No	No	No	No	No	No	No	No	No
23	2	21	2	0	No	No	No	No	No	No	No	No	No	No
24	2	21	2	0	No	No	No	No	No	No	No	No	No	No
Hours Met					0	0	0	0	0	0	0	0	0	0

Warrant 3 Condition A

Orientation	E	W
Total Stopped Delay Per Vehicle on Minor Approach (s)	81.5	138
Number of Lanes on Minor Street Approach	1	2
VehicleHours of Stopped Delay on Minor Approach ([h]h:mm)	0:00	1:11
Delay Condition Met	No	No
Volume on Minor Street Approach During Same Hour	0	31
High Minor Volume Condition Met	No	No
Total Entering Volume on All Approaches During Same Hour	2111	2111
Number of Approaches on Intersection	4	4
Total Volume Condition Met	Yes	Yes
Warrant Met for Approach	No	No
Warrant Met for Intersection	**No**	

Signal Warrants Report For Intersection 13: Carbon Canyon Road at Canyon Hills Road

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	No
#2	Four Hour Vehicular Volume	No
#3	Peak Hour	No

Intersection Warrants Parameters

Major Approaches	S, N
Minor Approaches	W
Speed > 40mph	Yes
Population < 10,000	No
Warrant Factor	70%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets
	S	N	W
1	1489	524	66
2	1444	508	64
3	1415	498	63
4	1325	466	59
5	1176	414	52
6	1161	409	51
7	1147	403	51
8	1042	367	46
9	1027	362	46
10	1013	356	45
11	879	309	39
12	819	288	36
13	804	283	36
14	596	210	26
15	596	210	26
16	417	147	18
17	238	84	11
18	238	84	11
19	134	47	6
20	74	26	3
21	45	16	2
22	15	5	1
23	15	5	1
24	15	5	1

Warrant Analysis by Hour

Hour	Major Streets		Minor Street		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	2	2013	1	66	No	No	No	No	No	Yes	Yes	Yes	Yes	No
2	2	1952	1	64	No	No	No	No	No	Yes	Yes	Yes	Yes	No
3	2	1913	1	63	No	No	No	No	No	Yes	Yes	Yes	Yes	No
4	2	1791	1	59	No	No	No	No	No	No	Yes	Yes	No	No
5	2	1590	1	52	No	No	No	No	No	No	Yes	Yes	No	No
6	2	1570	1	51	No	No	No	No	No	No	No	Yes	No	No
7	2	1550	1	51	No	No	No	No	No	No	No	Yes	No	No
8	2	1409	1	46	No	No	No	No	No	No	No	Yes	No	No
9	2	1389	1	46	No	No	No	No	No	No	No	Yes	No	No
10	2	1369	1	45	No	No	No	No	No	No	No	Yes	No	No
11	2	1188	1	39	No	No	No	No	No	No	No	No	No	No
12	2	1107	1	36	No	No	No	No	No	No	No	No	No	No
13	2	1087	1	36	No	No	No	No	No	No	No	No	No	No
14	2	806	1	26	No	No	No	No	No	No	No	No	No	No
15	2	806	1	26	No	No	No	No	No	No	No	No	No	No
16	2	564	1	18	No	No	No	No	No	No	No	No	No	No
17	2	322	1	11	No	No	No	No	No	No	No	No	No	No
18	2	322	1	11	No	No	No	No	No	No	No	No	No	No
19	2	181	1	6	No	No	No	No	No	No	No	No	No	No
20	2	100	1	3	No	No	No	No	No	No	No	No	No	No
21	2	61	1	2	No	No	No	No	No	No	No	No	No	No
22	2	20	1	1	No	No	No	No	No	No	No	No	No	No
23	2	20	1	1	No	No	No	No	No	No	No	No	No	No
24	2	20	1	1	No	No	No	No	No	No	No	No	No	No
Hours Met					0	0	0	0	0	3	5	10	3	0

Warrant 3 Condition A

Orientation	W
Total Stopped Delay Per Vehicle on Minor Approach (s)	117.4
Number of Lanes on Minor Street Approach	1
VehicleHours of Stopped Delay on Minor Approach ([h]h:mm)	2:09
Delay Condition Met	No
Volume on Minor Street Approach During Same Hour	66
High Minor Volume Condition Met	No
Total Entering Volume on All Approaches During Same Hour	2079
Number of Approaches on Intersection	3
Total Volume Condition Met	Yes
Warrant Met for Approach	No
Warrant Met for Intersection	**No**

APPENDIX G-IV

YEAR 2029 WITH PROJECT TRAFFIC CONDITIONS

Signal Warrants Report For Intersection 7: Pipeline Avenue at Woodview Road

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	Yes
#2	Four Hour Vehicular Volume	Yes
#3	Peak Hour	Yes

Intersection Warrants Parameters

Major Approaches	S, N
Minor Approaches	W
Speed > 40mph	No
Population < 10,000	No
Warrant Factor	100%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets
	S	N	W
1	607	335	320
2	589	325	310
3	577	318	304
4	540	298	285
5	480	265	253
6	473	261	250
7	467	258	246
8	425	234	224
9	419	231	221
10	413	228	218
11	358	198	189
12	334	184	176
13	328	181	173
14	243	134	128
15	243	134	128
16	170	94	90
17	97	54	51
18	97	54	51
19	55	30	29
20	30	17	16
21	18	10	10
22	6	3	3
23	6	3	3
24	6	3	3

Warrant Analysis by Hour

Hour	Major Streets		Minor Street		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	1	942	1	320	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
2	1	914	1	310	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
3	1	895	1	304	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
4	1	838	1	285	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
5	1	745	1	253	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	No
6	1	734	1	250	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	No
7	1	725	1	246	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	No
8	1	659	1	224	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	No
9	1	650	1	221	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	No
10	1	641	1	218	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	No
11	1	556	1	189	Yes	Yes	Yes	Yes	No	No	Yes	Yes	No	No
12	1	518	1	176	Yes	Yes	Yes	Yes	No	No	No	Yes	No	No
13	1	509	1	173	Yes	Yes	Yes	Yes	No	No	No	Yes	No	No
14	1	377	1	128	No	No	Yes	Yes	No	No	No	No	No	No
15	1	377	1	128	No	No	Yes	Yes	No	No	No	No	No	No
16	1	264	1	90	No	No	No	No	No	No	No	No	No	No
17	1	151	1	51	No	No	No	No	No	No	No	No	No	No
18	1	151	1	51	No	No	No	No	No	No	No	No	No	No
19	1	85	1	29	No	No	No	No	No	No	No	No	No	No
20	1	47	1	16	No	No	No	No	No	No	No	No	No	No
21	1	28	1	10	No	No	No	No	No	No	No	No	No	No
22	1	9	1	3	No	No	No	No	No	No	No	No	No	No
23	1	9	1	3	No	No	No	No	No	No	No	No	No	No
24	1	9	1	3	No	No	No	No	No	No	No	No	No	No
Hours Met					13	13	15	15	4	10	11	13	10	1

Warrant 3 Condition A

Orientation	W
Total Stopped Delay Per Vehicle on Minor Approach (s)	102.7
Number of Lanes on Minor Street Approach	1
VehicleHours of Stopped Delay on Minor Approach ([h]h:mm)	9:07
Delay Condition Met	Yes
Volume on Minor Street Approach During Same Hour	320
High Minor Volume Condition Met	Yes
Total Entering Volume on All Approaches During Same Hour	1262
Number of Approaches on Intersection	3
Total Volume Condition Met	Yes
Warrant Met for Approach	Yes
Warrant Met for Intersection	**Yes**

Signal Warrants Report For Intersection 12: Carbon Canyon Road at Fairway Drive/Ginseng Lane

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	No
#2	Four Hour Vehicular Volume	No
#3	Peak Hour	No

Intersection Warrants Parameters

Major Approaches	S, N
Minor Approaches	E, W
Speed > 40mph	Yes
Population < 10,000	No
Warrant Factor	70%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets	
	S	N	E	W
1	547	1591	0	61
2	531	1543	0	59
3	520	1511	0	58
4	487	1416	0	54
5	432	1257	0	48
6	427	1241	0	48
7	421	1225	0	47
8	383	1114	0	43
9	377	1098	0	42
10	372	1082	0	41
11	323	939	0	36
12	301	875	0	34
13	295	859	0	33
14	219	636	0	24
15	219	636	0	24
16	153	445	0	17
17	88	255	0	10
18	88	255	0	10
19	49	143	0	5
20	27	80	0	3
21	16	48	0	2
22	5	16	0	1
23	5	16	0	1
24	5	16	0	1

Warrant Analysis by Hour

Hour	Major Streets		Minor Street		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	2	2138	2	61	No	No	No	No	No	No	No	Yes	No	No
2	2	2074	2	59	No	No	No	No	No	No	No	Yes	No	No
3	2	2031	2	58	No	No	No	No	No	No	No	Yes	No	No
4	2	1903	2	54	No	No	No	No	No	No	No	No	No	No
5	2	1689	2	48	No	No	No	No	No	No	No	No	No	No
6	2	1668	2	48	No	No	No	No	No	No	No	No	No	No
7	2	1646	2	47	No	No	No	No	No	No	No	No	No	No
8	2	1497	2	43	No	No	No	No	No	No	No	No	No	No
9	2	1475	2	42	No	No	No	No	No	No	No	No	No	No
10	2	1454	2	41	No	No	No	No	No	No	No	No	No	No
11	2	1262	2	36	No	No	No	No	No	No	No	No	No	No
12	2	1176	2	34	No	No	No	No	No	No	No	No	No	No
13	2	1154	2	33	No	No	No	No	No	No	No	No	No	No
14	2	855	2	24	No	No	No	No	No	No	No	No	No	No
15	2	855	2	24	No	No	No	No	No	No	No	No	No	No
16	2	598	2	17	No	No	No	No	No	No	No	No	No	No
17	2	343	2	10	No	No	No	No	No	No	No	No	No	No
18	2	343	2	10	No	No	No	No	No	No	No	No	No	No
19	2	192	2	5	No	No	No	No	No	No	No	No	No	No
20	2	107	2	3	No	No	No	No	No	No	No	No	No	No
21	2	64	2	2	No	No	No	No	No	No	No	No	No	No
22	2	21	2	1	No	No	No	No	No	No	No	No	No	No
23	2	21	2	1	No	No	No	No	No	No	No	No	No	No
24	2	21	2	1	No	No	No	No	No	No	No	No	No	No
Hours Met					0	0	0	0	0	0	0	3	0	0

Warrant 3 Condition A

Orientation	E	W
Total Stopped Delay Per Vehicle on Minor Approach (s)	98.9	286.7
Number of Lanes on Minor Street Approach	1	2
VehicleHours of Stopped Delay on Minor Approach ([h]h:mm)	0:00	4:51
Delay Condition Met	No	No
Volume on Minor Street Approach During Same Hour	0	61
High Minor Volume Condition Met	No	No
Total Entering Volume on All Approaches During Same Hour	2199	2199
Number of Approaches on Intersection	4	4
Total Volume Condition Met	Yes	Yes
Warrant Met for Approach	No	No
Warrant Met for Intersection	**No**	

Signal Warrants Report For Intersection 13: Carbon Canyon Road at Canyon Hills Road

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	Yes
#2	Four Hour Vehicular Volume	Yes
#3	Peak Hour	Yes

Intersection Warrants Parameters

Major Approaches	S, N
Minor Approaches	W
Speed > 40mph	Yes
Population < 10,000	No
Warrant Factor	70%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets
	S	N	W
1	428	1582	99
2	415	1535	96
3	407	1503	94
4	381	1408	88
5	338	1250	78
6	334	1234	77
7	330	1218	76
8	300	1107	69
9	295	1092	68
10	291	1076	67
11	253	933	58
12	235	870	54
13	231	854	53
14	171	633	40
15	171	633	40
16	120	443	28
17	68	253	16
18	68	253	16
19	39	142	9
20	21	79	5
21	13	47	3
22	4	16	1
23	4	16	1
24	4	16	1

Warrant Analysis by Hour

Hour	Major Streets		Minor Street		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	2	2010	1	99	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
2	2	1950	1	96	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
3	2	1910	1	94	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
4	2	1789	1	88	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
5	2	1588	1	78	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes
6	2	1568	1	77	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes
7	2	1548	1	76	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes
8	2	1407	1	69	No	No	No	No	No	Yes	Yes	Yes	Yes	No
9	2	1387	1	68	No	No	No	No	No	Yes	Yes	Yes	Yes	No
10	2	1367	1	67	No	No	No	No	No	Yes	Yes	Yes	Yes	No
11	2	1186	1	58	No	No	No	No	No	No	Yes	Yes	No	No
12	2	1105	1	54	No	No	No	No	No	No	Yes	Yes	No	No
13	2	1085	1	53	No	No	No	No	No	No	Yes	Yes	No	No
14	2	804	1	40	No	No	No	No	No	No	No	No	No	No
15	2	804	1	40	No	No	No	No	No	No	No	No	No	No
16	2	563	1	28	No	No	No	No	No	No	No	No	No	No
17	2	321	1	16	No	No	No	No	No	No	No	No	No	No
18	2	321	1	16	No	No	No	No	No	No	No	No	No	No
19	2	181	1	9	No	No	No	No	No	No	No	No	No	No
20	2	100	1	5	No	No	No	No	No	No	No	No	No	No
21	2	60	1	3	No	No	No	No	No	No	No	No	No	No
22	2	20	1	1	No	No	No	No	No	No	No	No	No	No
23	2	20	1	1	No	No	No	No	No	No	No	No	No	No
24	2	20	1	1	No	No	No	No	No	No	No	No	No	No
Hours Met					0	0	0	4	7	10	13	13	10	7

Warrant 3 Condition A

Orientation	W
Total Stopped Delay Per Vehicle on Minor Approach (s)	358.3
Number of Lanes on Minor Street Approach	1
VehicleHours of Stopped Delay on Minor Approach ([h]h:mm)	9:51
Delay Condition Met	Yes
Volume on Minor Street Approach During Same Hour	99
High Minor Volume Condition Met	No
Total Entering Volume on All Approaches During Same Hour	2109
Number of Approaches on Intersection	3
Total Volume Condition Met	Yes
Warrant Met for Approach	No
Warrant Met for Intersection	**No**

Signal Warrants Report For Intersection 7: Pipeline Avenue at Woodview Road

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	Yes
#2	Four Hour Vehicular Volume	Yes
#3	Peak Hour	No

Intersection Warrants Parameters

Major Approaches	S, N
Minor Approaches	W
Speed > 40mph	No
Population < 10,000	No
Warrant Factor	100%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets
	S	N	W
1	466	528	247
2	452	512	240
3	443	502	235
4	415	470	220
5	368	417	195
6	363	412	193
7	359	407	190
8	326	370	173
9	322	364	170
10	317	359	168
11	275	312	146
12	256	290	136
13	252	285	133
14	186	211	99
15	186	211	99
16	130	148	69
17	75	84	40
18	75	84	40
19	42	48	22
20	23	26	12
21	14	16	7
22	5	5	2
23	5	5	2
24	5	5	2

Warrant Analysis by Hour

Hour	Major Streets		Minor Street		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	1	994	1	247	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
2	1	964	1	240	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
3	1	945	1	235	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
4	1	885	1	220	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
5	1	785	1	195	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
6	1	775	1	193	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
7	1	766	1	190	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
8	1	696	1	173	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	No	No
9	1	686	1	170	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	No	No
10	1	676	1	168	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	No	No
11	1	587	1	146	No	Yes	Yes	Yes	No	No	Yes	Yes	No	No
12	1	546	1	136	No	Yes	Yes	Yes	No	No	Yes	Yes	No	No
13	1	537	1	133	No	Yes	Yes	Yes	No	No	Yes	Yes	No	No
14	1	397	1	99	No	No	No	Yes	No	No	No	No	No	No
15	1	397	1	99	No	No	No	Yes	No	No	No	No	No	No
16	1	278	1	69	No	No	No	No	No	No	No	No	No	No
17	1	159	1	40	No	No	No	No	No	No	No	No	No	No
18	1	159	1	40	No	No	No	No	No	No	No	No	No	No
19	1	90	1	22	No	No	No	No	No	No	No	No	No	No
20	1	49	1	12	No	No	No	No	No	No	No	No	No	No
21	1	30	1	7	No	No	No	No	No	No	No	No	No	No
22	1	10	1	2	No	No	No	No	No	No	No	No	No	No
23	1	10	1	2	No	No	No	No	No	No	No	No	No	No
24	1	10	1	2	No	No	No	No	No	No	No	No	No	No
Hours Met					10	13	13	15	7	10	13	13	7	0

Warrant 3 Condition A

Orientation	W
Total Stopped Delay Per Vehicle on Minor Approach (s)	46.2
Number of Lanes on Minor Street Approach	1
VehicleHours of Stopped Delay on Minor Approach ([h]h:mm)	3:10
Delay Condition Met	No
Volume on Minor Street Approach During Same Hour	247
High Minor Volume Condition Met	Yes
Total Entering Volume on All Approaches During Same Hour	1241
Number of Approaches on Intersection	3
Total Volume Condition Met	Yes
Warrant Met for Approach	No
Warrant Met for Intersection	**No**

Signal Warrants Report For Intersection 12: Carbon Canyon Road at Fairway Drive/Ginseng Lane

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	No
#2	Four Hour Vehicular Volume	No
#3	Peak Hour	No

Intersection Warrants Parameters

Major Approaches	S, N
Minor Approaches	E, W
Speed > 40mph	Yes
Population < 10,000	No
Warrant Factor	70%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets	
	S	N	E	W
1	1615	685	0	59
2	1567	664	0	57
3	1534	651	0	56
4	1437	610	0	53
5	1276	541	0	47
6	1260	534	0	46
7	1244	527	0	45
8	1131	479	0	41
9	1114	473	0	41
10	1098	466	0	40
11	953	404	0	35
12	888	377	0	32
13	872	370	0	32
14	646	274	0	24
15	646	274	0	24
16	452	192	0	17
17	258	110	0	9
18	258	110	0	9
19	145	62	0	5
20	81	34	0	3
21	48	21	0	2
22	16	7	0	1
23	16	7	0	1
24	16	7	0	1

Warrant Analysis by Hour

Hour	Major Streets		Minor Street		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	2	2300	2	59	No	No	No	No	No	No	No	Yes	No	No
2	2	2231	2	57	No	No	No	No	No	No	No	Yes	No	No
3	2	2185	2	56	No	No	No	No	No	No	No	Yes	No	No
4	2	2047	2	53	No	No	No	No	No	No	No	No	No	No
5	2	1817	2	47	No	No	No	No	No	No	No	No	No	No
6	2	1794	2	46	No	No	No	No	No	No	No	No	No	No
7	2	1771	2	45	No	No	No	No	No	No	No	No	No	No
8	2	1610	2	41	No	No	No	No	No	No	No	No	No	No
9	2	1587	2	41	No	No	No	No	No	No	No	No	No	No
10	2	1564	2	40	No	No	No	No	No	No	No	No	No	No
11	2	1357	2	35	No	No	No	No	No	No	No	No	No	No
12	2	1265	2	32	No	No	No	No	No	No	No	No	No	No
13	2	1242	2	32	No	No	No	No	No	No	No	No	No	No
14	2	920	2	24	No	No	No	No	No	No	No	No	No	No
15	2	920	2	24	No	No	No	No	No	No	No	No	No	No
16	2	644	2	17	No	No	No	No	No	No	No	No	No	No
17	2	368	2	9	No	No	No	No	No	No	No	No	No	No
18	2	368	2	9	No	No	No	No	No	No	No	No	No	No
19	2	207	2	5	No	No	No	No	No	No	No	No	No	No
20	2	115	2	3	No	No	No	No	No	No	No	No	No	No
21	2	69	2	2	No	No	No	No	No	No	No	No	No	No
22	2	23	2	1	No	No	No	No	No	No	No	No	No	No
23	2	23	2	1	No	No	No	No	No	No	No	No	No	No
24	2	23	2	1	No	No	No	No	No	No	No	No	No	No
Hours Met					0	0	0	0	0	0	0	3	0	0

Warrant 3 Condition A

Orientation	E	W
Total Stopped Delay Per Vehicle on Minor Approach (s)	121.9	433.5
Number of Lanes on Minor Street Approach	1	2
VehicleHours of Stopped Delay on Minor Approach ([h]h:mm)	0:00	7:06
Delay Condition Met	No	Yes
Volume on Minor Street Approach During Same Hour	0	59
High Minor Volume Condition Met	No	No
Total Entering Volume on All Approaches During Same Hour	2359	2359
Number of Approaches on Intersection	4	4
Total Volume Condition Met	Yes	Yes
Warrant Met for Approach	No	No
Warrant Met for Intersection	**No**	

Signal Warrants Report For Intersection 13: Carbon Canyon Road at Canyon Hills Road

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	No
#2	Four Hour Vehicular Volume	No
#3	Peak Hour	No

Intersection Warrants Parameters

Major Approaches	S, N
Minor Approaches	W
Speed > 40mph	Yes
Population < 10,000	No
Warrant Factor	70%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets
	S	N	W
1	1617	604	66
2	1568	586	64
3	1536	574	63
4	1439	538	59
5	1277	477	52
6	1261	471	51
7	1245	465	51
8	1132	423	46
9	1116	417	46
10	1100	411	45
11	954	356	39
12	889	332	36
13	873	326	36
14	647	242	26
15	647	242	26
16	453	169	18
17	259	97	11
18	259	97	11
19	146	54	6
20	81	30	3
21	49	18	2
22	16	6	1
23	16	6	1
24	16	6	1

Warrant Analysis by Hour

Hour	Major Streets		Minor Street		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	2	2221	1	66	No	No	No	No	No	Yes	Yes	Yes	Yes	No
2	2	2154	1	64	No	No	No	No	No	Yes	Yes	Yes	Yes	No
3	2	2110	1	63	No	No	No	No	No	Yes	Yes	Yes	Yes	No
4	2	1977	1	59	No	No	No	No	No	No	Yes	Yes	No	No
5	2	1754	1	52	No	No	No	No	No	No	Yes	Yes	No	No
6	2	1732	1	51	No	No	No	No	No	No	No	Yes	No	No
7	2	1710	1	51	No	No	No	No	No	No	No	Yes	No	No
8	2	1555	1	46	No	No	No	No	No	No	No	Yes	No	No
9	2	1533	1	46	No	No	No	No	No	No	No	Yes	No	No
10	2	1511	1	45	No	No	No	No	No	No	No	Yes	No	No
11	2	1310	1	39	No	No	No	No	No	No	No	No	No	No
12	2	1221	1	36	No	No	No	No	No	No	No	No	No	No
13	2	1199	1	36	No	No	No	No	No	No	No	No	No	No
14	2	889	1	26	No	No	No	No	No	No	No	No	No	No
15	2	889	1	26	No	No	No	No	No	No	No	No	No	No
16	2	622	1	18	No	No	No	No	No	No	No	No	No	No
17	2	356	1	11	No	No	No	No	No	No	No	No	No	No
18	2	356	1	11	No	No	No	No	No	No	No	No	No	No
19	2	200	1	6	No	No	No	No	No	No	No	No	No	No
20	2	111	1	3	No	No	No	No	No	No	No	No	No	No
21	2	67	1	2	No	No	No	No	No	No	No	No	No	No
22	2	22	1	1	No	No	No	No	No	No	No	No	No	No
23	2	22	1	1	No	No	No	No	No	No	No	No	No	No
24	2	22	1	1	No	No	No	No	No	No	No	No	No	No
Hours Met					0	0	0	0	0	3	5	10	3	0

Warrant 3 Condition A

Orientation	W
Total Stopped Delay Per Vehicle on Minor Approach (s)	222.5
Number of Lanes on Minor Street Approach	1
VehicleHours of Stopped Delay on Minor Approach ([h]h:mm)	4:04
Delay Condition Met	Yes
Volume on Minor Street Approach During Same Hour	66
High Minor Volume Condition Met	No
Total Entering Volume on All Approaches During Same Hour	2287
Number of Approaches on Intersection	3
Total Volume Condition Met	Yes
Warrant Met for Approach	No
Warrant Met for Intersection	**No**

APPENDIX G-V

YEAR 2040 WITHOUT PROJECT TRAFFIC CONDITIONS

Signal Warrants Report For Intersection 7: Pipeline Avenue at Woodview Road

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	Yes
#2	Four Hour Vehicular Volume	Yes
#3	Peak Hour	Yes

Intersection Warrants Parameters

Major Approaches	S, N
Minor Approaches	W
Speed > 40mph	No
Population < 10,000	No
Warrant Factor	100%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets
	S	N	W
1	675	303	377
2	655	294	366
3	641	288	358
4	601	270	336
5	533	239	298
6	527	236	294
7	520	233	290
8	472	212	264
9	466	209	260
10	459	206	256
11	398	179	222
12	371	167	207
13	365	164	204
14	270	121	151
15	270	121	151
16	189	85	106
17	108	48	60
18	108	48	60
19	61	27	34
20	34	15	19
21	20	9	11
22	7	3	4
23	7	3	4
24	7	3	4

Warrant Analysis by Hour

Hour	Major Streets		Minor Street		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	1	978	1	377	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
2	1	949	1	366	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
3	1	929	1	358	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
4	1	871	1	336	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
5	1	772	1	298	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
6	1	763	1	294	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
7	1	753	1	290	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
8	1	684	1	264	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	No
9	1	675	1	260	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	No
10	1	665	1	256	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	No
11	1	577	1	222	Yes	Yes	Yes	Yes	No	No	Yes	Yes	No	No
12	1	538	1	207	Yes	Yes	Yes	Yes	No	No	Yes	Yes	No	No
13	1	529	1	204	Yes	Yes	Yes	Yes	No	No	Yes	Yes	No	No
14	1	391	1	151	No	No	Yes	Yes	No	No	No	No	No	No
15	1	391	1	151	No	No	Yes	Yes	No	No	No	No	No	No
16	1	274	1	106	No	No	No	No	No	No	No	No	No	No
17	1	156	1	60	No	No	No	No	No	No	No	No	No	No
18	1	156	1	60	No	No	No	No	No	No	No	No	No	No
19	1	88	1	34	No	No	No	No	No	No	No	No	No	No
20	1	49	1	19	No	No	No	No	No	No	No	No	No	No
21	1	29	1	11	No	No	No	No	No	No	No	No	No	No
22	1	10	1	4	No	No	No	No	No	No	No	No	No	No
23	1	10	1	4	No	No	No	No	No	No	No	No	No	No
24	1	10	1	4	No	No	No	No	No	No	No	No	No	No
Hours Met					13	13	15	15	7	10	13	13	10	3

Warrant 3 Condition A

Orientation	W
Total Stopped Delay Per Vehicle on Minor Approach (s)	103.9
Number of Lanes on Minor Street Approach	1
VehicleHours of Stopped Delay on Minor Approach ([h]h:mm)	10:52
Delay Condition Met	Yes
Volume on Minor Street Approach During Same Hour	377
High Minor Volume Condition Met	Yes
Total Entering Volume on All Approaches During Same Hour	1355
Number of Approaches on Intersection	3
Total Volume Condition Met	Yes
Warrant Met for Approach	Yes
Warrant Met for Intersection	**Yes**

Signal Warrants Report For Intersection 8: Pipeline Avenue at Soquel Canyon Parkway

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	Yes
#2	Four Hour Vehicular Volume	Yes
#3	Peak Hour	Yes

Intersection Warrants Parameters

Major Approaches	E, W
Minor Approaches	N
Speed > 40mph	Yes
Population < 10,000	No
Warrant Factor	70%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets
	E	W	N
1	638	86	584
2	619	83	566
3	606	82	555
4	568	77	520
5	504	68	461
6	498	67	456
7	491	66	450
8	447	60	409
9	440	59	403
10	434	58	397
11	376	51	345
12	351	47	321
13	345	46	315
14	255	34	234
15	255	34	234
16	179	24	164
17	102	14	93
18	102	14	93
19	57	8	53
20	32	4	29
21	19	3	18
22	6	1	6
23	6	1	6
24	6	1	6

Warrant Analysis by Hour

Hour	Major Streets		Minor Street		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	4	724	1	584	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes
2	4	702	1	566	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Yes	Yes
3	4	688	1	555	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Yes	Yes
4	4	645	1	520	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Yes	Yes
5	4	572	1	461	No	Yes	Yes	Yes	No	No	No	Yes	Yes	Yes
6	4	565	1	456	No	Yes	Yes	Yes	No	No	No	Yes	Yes	Yes
7	4	557	1	450	No	Yes	Yes	Yes	No	No	No	Yes	Yes	Yes
8	4	507	1	409	No	Yes	Yes	Yes	No	No	No	Yes	Yes	Yes
9	4	499	1	403	No	Yes	Yes	Yes	No	No	No	No	Yes	Yes
10	4	492	1	397	No	Yes	Yes	Yes	No	No	No	No	Yes	Yes
11	4	427	1	345	No	No	Yes	Yes	No	No	No	No	Yes	Yes
12	4	398	1	321	No	No	No	Yes	No	No	No	No	Yes	No
13	4	391	1	315	No	No	No	Yes	No	No	No	No	Yes	No
14	4	289	1	234	No	No	No	No	No	No	No	No	No	No
15	4	289	1	234	No	No	No	No	No	No	No	No	No	No
16	4	203	1	164	No	No	No	No	No	No	No	No	No	No
17	4	116	1	93	No	No	No	No	No	No	No	No	No	No
18	4	116	1	93	No	No	No	No	No	No	No	No	No	No
19	4	65	1	53	No	No	No	No	No	No	No	No	No	No
20	4	36	1	29	No	No	No	No	No	No	No	No	No	No
21	4	22	1	18	No	No	No	No	No	No	No	No	No	No
22	4	7	1	6	No	No	No	No	No	No	No	No	No	No
23	4	7	1	6	No	No	No	No	No	No	No	No	No	No
24	4	7	1	6	No	No	No	No	No	No	No	No	No	No
Hours Met					4	10	11	13	0	1	4	8	13	11

Warrant 3 Condition A

Orientation	N
Total Stopped Delay Per Vehicle on Minor Approach (s)	110.2
Number of Lanes on Minor Street Approach	1
VehicleHours of Stopped Delay on Minor Approach ([h]h:mm)	17:53
Delay Condition Met	Yes
Volume on Minor Street Approach During Same Hour	584
High Minor Volume Condition Met	Yes
Total Entering Volume on All Approaches During Same Hour	1308
Number of Approaches on Intersection	3
Total Volume Condition Met	Yes
Warrant Met for Approach	Yes
Warrant Met for Intersection	**Yes**

Signal Warrants Report For Intersection 12: Carbon Canyon Road at Fairway Drive/Ginseng Lane

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	No
#2	Four Hour Vehicular Volume	No
#3	Peak Hour	No

Intersection Warrants Parameters

Major Approaches	S, N
Minor Approaches	E, W
Speed > 40mph	Yes
Population < 10,000	No
Warrant Factor	70%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets	
	S	N	E	W
1	643	1962	0	8
2	624	1903	0	8
3	611	1864	0	8
4	572	1746	0	7
5	508	1550	0	6
6	502	1530	0	6
7	495	1511	0	6
8	450	1373	0	6
9	444	1354	0	6
10	437	1334	0	5
11	379	1158	0	5
12	354	1079	0	4
13	347	1059	0	4
14	257	785	0	3
15	257	785	0	3
16	180	549	0	2
17	103	314	0	1
18	103	314	0	1
19	58	177	0	1
20	32	98	0	0
21	19	59	0	0
22	6	20	0	0
23	6	20	0	0
24	6	20	0	0

Warrant Analysis by Hour

Hour	Major Streets		Minor Street		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	2	2605	2	8	No	No	No	No	No	No	No	No	No	No
2	2	2527	2	8	No	No	No	No	No	No	No	No	No	No
3	2	2475	2	8	No	No	No	No	No	No	No	No	No	No
4	2	2318	2	7	No	No	No	No	No	No	No	No	No	No
5	2	2058	2	6	No	No	No	No	No	No	No	No	No	No
6	2	2032	2	6	No	No	No	No	No	No	No	No	No	No
7	2	2006	2	6	No	No	No	No	No	No	No	No	No	No
8	2	1823	2	6	No	No	No	No	No	No	No	No	No	No
9	2	1798	2	6	No	No	No	No	No	No	No	No	No	No
10	2	1771	2	5	No	No	No	No	No	No	No	No	No	No
11	2	1537	2	5	No	No	No	No	No	No	No	No	No	No
12	2	1433	2	4	No	No	No	No	No	No	No	No	No	No
13	2	1406	2	4	No	No	No	No	No	No	No	No	No	No
14	2	1042	2	3	No	No	No	No	No	No	No	No	No	No
15	2	1042	2	3	No	No	No	No	No	No	No	No	No	No
16	2	729	2	2	No	No	No	No	No	No	No	No	No	No
17	2	417	2	1	No	No	No	No	No	No	No	No	No	No
18	2	417	2	1	No	No	No	No	No	No	No	No	No	No
19	2	235	2	1	No	No	No	No	No	No	No	No	No	No
20	2	130	2	0	No	No	No	No	No	No	No	No	No	No
21	2	78	2	0	No	No	No	No	No	No	No	No	No	No
22	2	26	2	0	No	No	No	No	No	No	No	No	No	No
23	2	26	2	0	No	No	No	No	No	No	No	No	No	No
24	2	26	2	0	No	No	No	No	No	No	No	No	No	No
Hours Met					0	0	0	0	0	0	0	0	0	0

Warrant 3 Condition A

Orientation	E	W
Total Stopped Delay Per Vehicle on Minor Approach (s)	182.4	241.4
Number of Lanes on Minor Street Approach	1	2
VehicleHours of Stopped Delay on Minor Approach ([h]h:mm)	0:00	0:32
Delay Condition Met	No	No
Volume on Minor Street Approach During Same Hour	0	8
High Minor Volume Condition Met	No	No
Total Entering Volume on All Approaches During Same Hour	2613	2613
Number of Approaches on Intersection	4	4
Total Volume Condition Met	Yes	Yes
Warrant Met for Approach	No	No
Warrant Met for Intersection	**No**	

Signal Warrants Report For Intersection 13: Carbon Canyon Road at Canyon Hills Road

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	Yes
#2	Four Hour Vehicular Volume	Yes
#3	Peak Hour	Yes

Intersection Warrants Parameters

Major Approaches	S, N
Minor Approaches	E, W
Speed > 40mph	Yes
Population < 10,000	No
Warrant Factor	70%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets	
	S	N	E	W
1	554	1955	29	104
2	537	1896	28	101
3	526	1857	28	99
4	493	1740	26	93
5	438	1544	23	82
6	432	1525	23	81
7	427	1505	22	80
8	388	1369	20	73
9	382	1349	20	72
10	377	1329	20	71
11	327	1153	17	61
12	305	1075	16	57
13	299	1056	16	56
14	222	782	12	42
15	222	782	12	42
16	155	547	8	29
17	89	313	5	17
18	89	313	5	17
19	50	176	3	9
20	28	98	1	5
21	17	59	1	3
22	6	20	0	1
23	6	20	0	1
24	6	20	0	1

Warrant Analysis by Hour

Hour	Major Streets		Minor Street		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	2	2509	1	104	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
2	2	2433	1	101	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
3	2	2383	1	99	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
4	2	2233	1	93	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
5	2	1982	1	82	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes
6	2	1957	1	81	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes
7	2	1932	1	80	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes
8	2	1757	1	73	No	No	No	No	No	Yes	Yes	Yes	Yes	No
9	2	1731	1	72	No	No	No	No	No	Yes	Yes	Yes	Yes	No
10	2	1706	1	71	No	No	No	No	No	Yes	Yes	Yes	Yes	No
11	2	1480	1	61	No	No	No	No	No	Yes	Yes	Yes	Yes	No
12	2	1380	1	57	No	No	No	No	No	No	Yes	Yes	No	No
13	2	1355	1	56	No	No	No	No	No	No	Yes	Yes	No	No
14	2	1004	1	42	No	No	No	No	No	No	No	Yes	No	No
15	2	1004	1	42	No	No	No	No	No	No	No	Yes	No	No
16	2	702	1	29	No	No	No	No	No	No	No	No	No	No
17	2	402	1	17	No	No	No	No	No	No	No	No	No	No
18	2	402	1	17	No	No	No	No	No	No	No	No	No	No
19	2	226	1	9	No	No	No	No	No	No	No	No	No	No
20	2	126	1	5	No	No	No	No	No	No	No	No	No	No
21	2	76	1	3	No	No	No	No	No	No	No	No	No	No
22	2	26	1	1	No	No	No	No	No	No	No	No	No	No
23	2	26	1	1	No	No	No	No	No	No	No	No	No	No
24	2	26	1	1	No	No	No	No	No	No	No	No	No	No
Hours Met					0	0	0	4	7	11	13	15	11	7

Warrant 3 Condition A

Orientation	E	W
Total Stopped Delay Per Vehicle on Minor Approach (s)	2301.4	2281.2
Number of Lanes on Minor Street Approach	1	1
VehicleHours of Stopped Delay on Minor Approach ([h]h:mm)	18:32	65:53
Delay Condition Met	Yes	Yes
Volume on Minor Street Approach During Same Hour	29	104
High Minor Volume Condition Met	No	Yes
Total Entering Volume on All Approaches During Same Hour	2642	2642
Number of Approaches on Intersection	4	4
Total Volume Condition Met	Yes	Yes
Warrant Met for Approach	No	Yes
Warrant Met for Intersection	**Yes**	

Signal Warrants Report For Intersection 7: Pipeline Avenue at Woodview Road

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	Yes
#2	Four Hour Vehicular Volume	Yes
#3	Peak Hour	No

Intersection Warrants Parameters

Major Approaches	S, N
Minor Approaches	W
Speed > 40mph	No
Population < 10,000	No
Warrant Factor	100%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets
	S	N	W
1	486	413	319
2	471	401	309
3	462	392	303
4	433	368	284
5	384	326	252
6	379	322	249
7	374	318	246
8	340	289	223
9	335	285	220
10	330	281	217
11	287	244	188
12	267	227	175
13	262	223	172
14	194	165	128
15	194	165	128
16	136	116	89
17	78	66	51
18	78	66	51
19	44	37	29
20	24	21	16
21	15	12	10
22	5	4	3
23	5	4	3
24	5	4	3

Warrant Analysis by Hour

Hour	Major Streets		Minor Street		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	1	899	1	319	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
2	1	872	1	309	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
3	1	854	1	303	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
4	1	801	1	284	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
5	1	710	1	252	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	No
6	1	701	1	249	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	No
7	1	692	1	246	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	No
8	1	629	1	223	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	No
9	1	620	1	220	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	No
10	1	611	1	217	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	No
11	1	531	1	188	Yes	Yes	Yes	Yes	No	No	Yes	Yes	No	No
12	1	494	1	175	No	Yes	Yes	Yes	No	No	No	Yes	No	No
13	1	485	1	172	No	Yes	Yes	Yes	No	No	No	Yes	No	No
14	1	359	1	128	No	No	Yes	Yes	No	No	No	No	No	No
15	1	359	1	128	No	No	Yes	Yes	No	No	No	No	No	No
16	1	252	1	89	No	No	No	No	No	No	No	No	No	No
17	1	144	1	51	No	No	No	No	No	No	No	No	No	No
18	1	144	1	51	No	No	No	No	No	No	No	No	No	No
19	1	81	1	29	No	No	No	No	No	No	No	No	No	No
20	1	45	1	16	No	No	No	No	No	No	No	No	No	No
21	1	27	1	10	No	No	No	No	No	No	No	No	No	No
22	1	9	1	3	No	No	No	No	No	No	No	No	No	No
23	1	9	1	3	No	No	No	No	No	No	No	No	No	No
24	1	9	1	3	No	No	No	No	No	No	No	No	No	No
Hours Met					11	13	15	15	4	10	11	13	10	0

Warrant 3 Condition A

Orientation	W
Total Stopped Delay Per Vehicle on Minor Approach (s)	34.8
Number of Lanes on Minor Street Approach	1
VehicleHours of Stopped Delay on Minor Approach ([h]h:mm)	3:04
Delay Condition Met	No
Volume on Minor Street Approach During Same Hour	319
High Minor Volume Condition Met	Yes
Total Entering Volume on All Approaches During Same Hour	1218
Number of Approaches on Intersection	3
Total Volume Condition Met	Yes
Warrant Met for Approach	No
Warrant Met for Intersection	**No**

Signal Warrants Report For Intersection 8: Pipeline Avenue at Soquel Canyon Parkway

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	No
#2	Four Hour Vehicular Volume	Yes
#3	Peak Hour	Yes

Intersection Warrants Parameters

Major Approaches	E, W
Minor Approaches	N
Speed > 40mph	Yes
Population < 10,000	No
Warrant Factor	70%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets
	E	W	N
1	527	56	574
2	511	54	557
3	501	53	545
4	469	50	511
5	416	44	453
6	411	44	448
7	406	43	442
8	369	39	402
9	364	39	396
10	358	38	390
11	311	33	339
12	290	31	316
13	285	30	310
14	211	22	230
15	211	22	230
16	148	16	161
17	84	9	92
18	84	9	92
19	47	5	52
20	26	3	29
21	16	2	17
22	5	1	6
23	5	1	6
24	5	1	6

Warrant Analysis by Hour

Hour	Major Streets		Minor Street		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	4	583	1	574	No	Yes	Yes	Yes	No	No	No	Yes	Yes	Yes
2	4	565	1	557	No	Yes	Yes	Yes	No	No	No	Yes	Yes	Yes
3	4	554	1	545	No	Yes	Yes	Yes	No	No	No	Yes	Yes	Yes
4	4	519	1	511	No	Yes	Yes	Yes	No	No	No	Yes	Yes	Yes
5	4	460	1	453	No	No	Yes	Yes	No	No	No	No	Yes	Yes
6	4	455	1	448	No	No	Yes	Yes	No	No	No	No	Yes	Yes
7	4	449	1	442	No	No	Yes	Yes	No	No	No	No	Yes	Yes
8	4	408	1	402	No	No	No	Yes	No	No	No	No	Yes	Yes
9	4	403	1	396	No	No	No	Yes	No	No	No	No	Yes	Yes
10	4	396	1	390	No	No	No	Yes	No	No	No	No	Yes	Yes
11	4	344	1	339	No	No	No	Yes	No	No	No	No	Yes	No
12	4	321	1	316	No	No	No	No	No	No	No	No	Yes	No
13	4	315	1	310	No	No	No	No	No	No	No	No	Yes	No
14	4	233	1	230	No	No	No	No	No	No	No	No	No	No
15	4	233	1	230	No	No	No	No	No	No	No	No	No	No
16	4	164	1	161	No	No	No	No	No	No	No	No	No	No
17	4	93	1	92	No	No	No	No	No	No	No	No	No	No
18	4	93	1	92	No	No	No	No	No	No	No	No	No	No
19	4	52	1	52	No	No	No	No	No	No	No	No	No	No
20	4	29	1	29	No	No	No	No	No	No	No	No	No	No
21	4	18	1	17	No	No	No	No	No	No	No	No	No	No
22	4	6	1	6	No	No	No	No	No	No	No	No	No	No
23	4	6	1	6	No	No	No	No	No	No	No	No	No	No
24	4	6	1	6	No	No	No	No	No	No	No	No	No	No
Hours Met					0	4	7	11	0	0	0	4	13	10

Warrant 3 Condition A

Orientation	N
Total Stopped Delay Per Vehicle on Minor Approach (s)	78.3
Number of Lanes on Minor Street Approach	1
VehicleHours of Stopped Delay on Minor Approach ([h]h:mm)	12:28
Delay Condition Met	Yes
Volume on Minor Street Approach During Same Hour	574
High Minor Volume Condition Met	Yes
Total Entering Volume on All Approaches During Same Hour	1157
Number of Approaches on Intersection	3
Total Volume Condition Met	Yes
Warrant Met for Approach	Yes
Warrant Met for Intersection	**Yes**

Signal Warrants Report For Intersection 12: Carbon Canyon Road at Fairway Drive/Ginseng Lane

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	No
#2	Four Hour Vehicular Volume	No
#3	Peak Hour	No

Intersection Warrants Parameters

Major Approaches	S, N
Minor Approaches	E, W
Speed > 40mph	Yes
Population < 10,000	No
Warrant Factor	70%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets	
	S	N	E	W
1	1987	864	0	33
2	1927	838	0	32
3	1888	821	0	31
4	1768	769	0	29
5	1570	683	0	26
6	1550	674	0	26
7	1530	665	0	25
8	1391	605	0	23
9	1371	596	0	23
10	1351	588	0	22
11	1172	510	0	19
12	1093	475	0	18
13	1073	467	0	18
14	795	346	0	13
15	795	346	0	13
16	556	242	0	9
17	318	138	0	5
18	318	138	0	5
19	179	78	0	3
20	99	43	0	2
21	60	26	0	1
22	20	9	0	0
23	20	9	0	0
24	20	9	0	0

Warrant Analysis by Hour

Hour	Major Streets		Minor Street		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	2	2851	2	33	No	No	No	No	No	No	No	No	No	No
2	2	2765	2	32	No	No	No	No	No	No	No	No	No	No
3	2	2709	2	31	No	No	No	No	No	No	No	No	No	No
4	2	2537	2	29	No	No	No	No	No	No	No	No	No	No
5	2	2253	2	26	No	No	No	No	No	No	No	No	No	No
6	2	2224	2	26	No	No	No	No	No	No	No	No	No	No
7	2	2195	2	25	No	No	No	No	No	No	No	No	No	No
8	2	1996	2	23	No	No	No	No	No	No	No	No	No	No
9	2	1967	2	23	No	No	No	No	No	No	No	No	No	No
10	2	1939	2	22	No	No	No	No	No	No	No	No	No	No
11	2	1682	2	19	No	No	No	No	No	No	No	No	No	No
12	2	1568	2	18	No	No	No	No	No	No	No	No	No	No
13	2	1540	2	18	No	No	No	No	No	No	No	No	No	No
14	2	1141	2	13	No	No	No	No	No	No	No	No	No	No
15	2	1141	2	13	No	No	No	No	No	No	No	No	No	No
16	2	798	2	9	No	No	No	No	No	No	No	No	No	No
17	2	456	2	5	No	No	No	No	No	No	No	No	No	No
18	2	456	2	5	No	No	No	No	No	No	No	No	No	No
19	2	257	2	3	No	No	No	No	No	No	No	No	No	No
20	2	142	2	2	No	No	No	No	No	No	No	No	No	No
21	2	86	2	1	No	No	No	No	No	No	No	No	No	No
22	2	29	2	0	No	No	No	No	No	No	No	No	No	No
23	2	29	2	0	No	No	No	No	No	No	No	No	No	No
24	2	29	2	0	No	No	No	No	No	No	No	No	No	No
Hours Met					0	0	0	0	0	0	0	0	0	0

Warrant 3 Condition A

Orientation	E	W
Total Stopped Delay Per Vehicle on Minor Approach (s)	304.5	1035
Number of Lanes on Minor Street Approach	1	2
VehicleHours of Stopped Delay on Minor Approach ([h]h:mm)	0:00	9:29
Delay Condition Met	No	Yes
Volume on Minor Street Approach During Same Hour	0	33
High Minor Volume Condition Met	No	No
Total Entering Volume on All Approaches During Same Hour	2884	2884
Number of Approaches on Intersection	4	4
Total Volume Condition Met	Yes	Yes
Warrant Met for Approach	No	No
Warrant Met for Intersection	**No**	

Signal Warrants Report For Intersection 13: Carbon Canyon Road at Canyon Hills Road

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	No
#2	Four Hour Vehicular Volume	Yes
#3	Peak Hour	No

Intersection Warrants Parameters

Major Approaches	S, N
Minor Approaches	E, W
Speed > 40mph	Yes
Population < 10,000	No
Warrant Factor	70%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets	
	S	N	E	W
1	2015	843	19	70
2	1955	818	18	68
3	1914	801	18	67
4	1793	750	17	62
5	1592	666	15	55
6	1572	658	15	55
7	1552	649	15	54
8	1411	590	13	49
9	1390	582	13	48
10	1370	573	13	48
11	1189	497	11	41
12	1108	464	10	39
13	1088	455	10	38
14	806	337	8	28
15	806	337	8	28
16	564	236	5	20
17	322	135	3	11
18	322	135	3	11
19	181	76	2	6
20	101	42	1	4
21	60	25	1	2
22	20	8	0	1
23	20	8	0	1
24	20	8	0	1

Warrant Analysis by Hour

Hour	Major Streets		Minor Street		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	2	2858	1	70	No	No	No	No	No	Yes	Yes	Yes	Yes	No
2	2	2773	1	68	No	No	No	No	No	Yes	Yes	Yes	Yes	No
3	2	2715	1	67	No	No	No	No	No	Yes	Yes	Yes	Yes	No
4	2	2543	1	62	No	No	No	No	No	Yes	Yes	Yes	Yes	No
5	2	2258	1	55	No	No	No	No	No	No	Yes	Yes	No	No
6	2	2230	1	55	No	No	No	No	No	No	Yes	Yes	No	No
7	2	2201	1	54	No	No	No	No	No	No	Yes	Yes	No	No
8	2	2001	1	49	No	No	No	No	No	No	No	Yes	No	No
9	2	1972	1	48	No	No	No	No	No	No	No	Yes	No	No
10	2	1943	1	48	No	No	No	No	No	No	No	Yes	No	No
11	2	1686	1	41	No	No	No	No	No	No	No	No	No	No
12	2	1572	1	39	No	No	No	No	No	No	No	No	No	No
13	2	1543	1	38	No	No	No	No	No	No	No	No	No	No
14	2	1143	1	28	No	No	No	No	No	No	No	No	No	No
15	2	1143	1	28	No	No	No	No	No	No	No	No	No	No
16	2	800	1	20	No	No	No	No	No	No	No	No	No	No
17	2	457	1	11	No	No	No	No	No	No	No	No	No	No
18	2	457	1	11	No	No	No	No	No	No	No	No	No	No
19	2	257	1	6	No	No	No	No	No	No	No	No	No	No
20	2	143	1	4	No	No	No	No	No	No	No	No	No	No
21	2	85	1	2	No	No	No	No	No	No	No	No	No	No
22	2	28	1	1	No	No	No	No	No	No	No	No	No	No
23	2	28	1	1	No	No	No	No	No	No	No	No	No	No
24	2	28	1	1	No	No	No	No	No	No	No	No	No	No
Hours Met					0	0	0	0	0	4	7	10	4	0

Warrant 3 Condition A

Orientation	E	W
Total Stopped Delay Per Vehicle on Minor Approach (s)	776.4	3328.5
Number of Lanes on Minor Street Approach	1	1
VehicleHours of Stopped Delay on Minor Approach ([h]h:mm)	4:05	64:43
Delay Condition Met	Yes	Yes
Volume on Minor Street Approach During Same Hour	19	70
High Minor Volume Condition Met	No	No
Total Entering Volume on All Approaches During Same Hour	2947	2947
Number of Approaches on Intersection	4	4
Total Volume Condition Met	Yes	Yes
Warrant Met for Approach	No	No
Warrant Met for Intersection	**No**	

APPENDIX G-VI

YEAR 2040 WITH PROJECT TRAFFIC CONDITIONS

Signal Warrants Report For Intersection 7: Pipeline Avenue at Woodview Road

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	Yes
#2	Four Hour Vehicular Volume	Yes
#3	Peak Hour	Yes

Intersection Warrants Parameters

Major Approaches	S, N
Minor Approaches	W
Speed > 40mph	No
Population < 10,000	No
Warrant Factor	100%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets
	S	N	W
1	614	350	331
2	596	340	321
3	583	333	314
4	546	312	295
5	485	277	261
6	479	273	258
7	473	270	255
8	430	245	232
9	424	241	228
10	418	238	225
11	362	207	195
12	338	193	182
13	332	189	179
14	246	140	132
15	246	140	132
16	172	98	93
17	98	56	53
18	98	56	53
19	55	32	30
20	31	18	17
21	18	11	10
22	6	4	3
23	6	4	3
24	6	4	3

Warrant Analysis by Hour

Hour	Major Streets		Minor Street		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	1	964	1	331	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
2	1	936	1	321	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
3	1	916	1	314	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
4	1	858	1	295	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
5	1	762	1	261	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
6	1	752	1	258	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
7	1	743	1	255	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	No
8	1	675	1	232	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	No
9	1	665	1	228	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	No
10	1	656	1	225	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	No
11	1	569	1	195	Yes	Yes	Yes	Yes	No	No	Yes	Yes	No	No
12	1	531	1	182	Yes	Yes	Yes	Yes	No	No	Yes	Yes	No	No
13	1	521	1	179	Yes	Yes	Yes	Yes	No	No	No	Yes	No	No
14	1	386	1	132	No	No	Yes	Yes	No	No	No	No	No	No
15	1	386	1	132	No	No	Yes	Yes	No	No	No	No	No	No
16	1	270	1	93	No	No	No	No	No	No	No	No	No	No
17	1	154	1	53	No	No	No	No	No	No	No	No	No	No
18	1	154	1	53	No	No	No	No	No	No	No	No	No	No
19	1	87	1	30	No	No	No	No	No	No	No	No	No	No
20	1	49	1	17	No	No	No	No	No	No	No	No	No	No
21	1	29	1	10	No	No	No	No	No	No	No	No	No	No
22	1	10	1	3	No	No	No	No	No	No	No	No	No	No
23	1	10	1	3	No	No	No	No	No	No	No	No	No	No
24	1	10	1	3	No	No	No	No	No	No	No	No	No	No
Hours Met					13	13	15	15	6	10	12	13	10	2

Warrant 3 Condition A

Orientation	W
Total Stopped Delay Per Vehicle on Minor Approach (s)	116
Number of Lanes on Minor Street Approach	1
VehicleHours of Stopped Delay on Minor Approach ([h]h:mm)	10:39
Delay Condition Met	Yes
Volume on Minor Street Approach During Same Hour	331
High Minor Volume Condition Met	Yes
Total Entering Volume on All Approaches During Same Hour	1295
Number of Approaches on Intersection	3
Total Volume Condition Met	Yes
Warrant Met for Approach	Yes
Warrant Met for Intersection	**Yes**

Signal Warrants Report For Intersection 8: Pipeline Avenue at Soquel Canyon Parkway

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	Yes
#2	Four Hour Vehicular Volume	Yes
#3	Peak Hour	Yes

Intersection Warrants Parameters

Major Approaches	E, W
Minor Approaches	N
Speed > 40mph	Yes
Population < 10,000	No
Warrant Factor	70%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets
	E	W	N
1	691	335	524
2	670	325	508
3	656	318	498
4	615	298	466
5	546	265	414
6	539	261	409
7	532	258	403
8	484	234	367
9	477	231	362
10	470	228	356
11	408	198	309
12	380	184	288
13	373	181	283
14	276	134	210
15	276	134	210
16	193	94	147
17	111	54	84
18	111	54	84
19	62	30	47
20	35	17	26
21	21	10	16
22	7	3	5
23	7	3	5
24	7	3	5

Warrant Analysis by Hour

Hour	Major Streets		Minor Street		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	4	1026	1	524	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
2	4	995	1	508	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
3	4	974	1	498	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
4	4	913	1	466	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
5	4	811	1	414	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes
6	4	800	1	409	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes
7	4	790	1	403	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes
8	4	718	1	367	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Yes	Yes
9	4	708	1	362	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Yes	Yes
10	4	698	1	356	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Yes	Yes
11	4	606	1	309	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes	Yes
12	4	564	1	288	No	Yes	Yes	Yes	No	No	No	Yes	Yes	Yes
13	4	554	1	283	No	Yes	Yes	Yes	No	No	No	Yes	Yes	Yes
14	4	410	1	210	No	No	No	Yes	No	No	No	No	Yes	No
15	4	410	1	210	No	No	No	Yes	No	No	No	No	Yes	No
16	4	287	1	147	No	No	No	No	No	No	No	No	No	No
17	4	165	1	84	No	No	No	No	No	No	No	No	No	No
18	4	165	1	84	No	No	No	No	No	No	No	No	No	No
19	4	92	1	47	No	No	No	No	No	No	No	No	No	No
20	4	52	1	26	No	No	No	No	No	No	No	No	No	No
21	4	31	1	16	No	No	No	No	No	No	No	No	No	No
22	4	10	1	5	No	No	No	No	No	No	No	No	No	No
23	4	10	1	5	No	No	No	No	No	No	No	No	No	No
24	4	10	1	5	No	No	No	No	No	No	No	No	No	No
Hours Met					11	13	13	15	4	7	10	13	15	13

Warrant 3 Condition A

Orientation	N
Total Stopped Delay Per Vehicle on Minor Approach (s)	68.2
Number of Lanes on Minor Street Approach	1
VehicleHours of Stopped Delay on Minor Approach ([h]h:mm)	9:55
Delay Condition Met	Yes
Volume on Minor Street Approach During Same Hour	524
High Minor Volume Condition Met	Yes
Total Entering Volume on All Approaches During Same Hour	1550
Number of Approaches on Intersection	3
Total Volume Condition Met	Yes
Warrant Met for Approach	Yes
Warrant Met for Intersection	**Yes**

Signal Warrants Report For Intersection 12: Carbon Canyon Road at Fairway Drive/Ginseng Lane

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	No
#2	Four Hour Vehicular Volume	No
#3	Peak Hour	No

Intersection Warrants Parameters

Major Approaches	S, N
Minor Approaches	E, W
Speed > 40mph	Yes
Population < 10,000	No
Warrant Factor	70%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets	
	S	N	E	W
1	687	2093	0	61
2	666	2030	0	59
3	653	1988	0	58
4	611	1863	0	54
5	543	1653	0	48
6	536	1633	0	48
7	529	1612	0	47
8	481	1465	0	43
9	474	1444	0	42
10	467	1423	0	41
11	405	1235	0	36
12	378	1151	0	34
13	371	1130	0	33
14	275	837	0	24
15	275	837	0	24
16	192	586	0	17
17	110	335	0	10
18	110	335	0	10
19	62	188	0	5
20	34	105	0	3
21	21	63	0	2
22	7	21	0	1
23	7	21	0	1
24	7	21	0	1

Warrant Analysis by Hour

Hour	Major Streets		Minor Street		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	2	2780	2	61	No	No	No	No	No	No	No	Yes	No	No
2	2	2696	2	59	No	No	No	No	No	No	No	Yes	No	No
3	2	2641	2	58	No	No	No	No	No	No	No	Yes	No	No
4	2	2474	2	54	No	No	No	No	No	No	No	No	No	No
5	2	2196	2	48	No	No	No	No	No	No	No	No	No	No
6	2	2169	2	48	No	No	No	No	No	No	No	No	No	No
7	2	2141	2	47	No	No	No	No	No	No	No	No	No	No
8	2	1946	2	43	No	No	No	No	No	No	No	No	No	No
9	2	1918	2	42	No	No	No	No	No	No	No	No	No	No
10	2	1890	2	41	No	No	No	No	No	No	No	No	No	No
11	2	1640	2	36	No	No	No	No	No	No	No	No	No	No
12	2	1529	2	34	No	No	No	No	No	No	No	No	No	No
13	2	1501	2	33	No	No	No	No	No	No	No	No	No	No
14	2	1112	2	24	No	No	No	No	No	No	No	No	No	No
15	2	1112	2	24	No	No	No	No	No	No	No	No	No	No
16	2	778	2	17	No	No	No	No	No	No	No	No	No	No
17	2	445	2	10	No	No	No	No	No	No	No	No	No	No
18	2	445	2	10	No	No	No	No	No	No	No	No	No	No
19	2	250	2	5	No	No	No	No	No	No	No	No	No	No
20	2	139	2	3	No	No	No	No	No	No	No	No	No	No
21	2	84	2	2	No	No	No	No	No	No	No	No	No	No
22	2	28	2	1	No	No	No	No	No	No	No	No	No	No
23	2	28	2	1	No	No	No	No	No	No	No	No	No	No
24	2	28	2	1	No	No	No	No	No	No	No	No	No	No
Hours Met					0	0	0	0	0	0	0	3	0	0

Warrant 3 Condition A

Orientation	E	W
Total Stopped Delay Per Vehicle on Minor Approach (s)	400.5	1331.5
Number of Lanes on Minor Street Approach	1	2
VehicleHours of Stopped Delay on Minor Approach ([h]h:mm)	0:00	22:33
Delay Condition Met	No	Yes
Volume on Minor Street Approach During Same Hour	0	61
High Minor Volume Condition Met	No	No
Total Entering Volume on All Approaches During Same Hour	2841	2841
Number of Approaches on Intersection	4	4
Total Volume Condition Met	Yes	Yes
Warrant Met for Approach	No	No
Warrant Met for Intersection	**No**	

Signal Warrants Report For Intersection 13: Carbon Canyon Road at Canyon Hills Road

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	Yes
#2	Four Hour Vehicular Volume	Yes
#3	Peak Hour	Yes

Intersection Warrants Parameters

Major Approaches	S, N
Minor Approaches	E, W
Speed > 40mph	Yes
Population < 10,000	No
Warrant Factor	70%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets	
	S	N	E	W
1	598	2101	29	104
2	580	2038	28	101
3	568	1996	28	99
4	532	1870	26	93
5	472	1660	23	82
6	466	1639	23	81
7	460	1618	22	80
8	419	1471	20	73
9	413	1450	20	72
10	407	1429	20	71
11	353	1240	17	61
12	329	1156	16	57
13	323	1135	16	56
14	239	840	12	42
15	239	840	12	42
16	167	588	8	29
17	96	336	5	17
18	96	336	5	17
19	54	189	3	9
20	30	105	1	5
21	18	63	1	3
22	6	21	0	1
23	6	21	0	1
24	6	21	0	1

Warrant Analysis by Hour

Hour	Major Streets		Minor Street		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	2	2699	1	104	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
2	2	2618	1	101	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
3	2	2564	1	99	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
4	2	2402	1	93	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
5	2	2132	1	82	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes
6	2	2105	1	81	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes
7	2	2078	1	80	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes
8	2	1890	1	73	No	No	No	No	No	Yes	Yes	Yes	Yes	No
9	2	1863	1	72	No	No	No	No	No	Yes	Yes	Yes	Yes	No
10	2	1836	1	71	No	No	No	No	No	Yes	Yes	Yes	Yes	No
11	2	1593	1	61	No	No	No	No	No	Yes	Yes	Yes	Yes	No
12	2	1485	1	57	No	No	No	No	No	No	Yes	Yes	No	No
13	2	1458	1	56	No	No	No	No	No	No	Yes	Yes	No	No
14	2	1079	1	42	No	No	No	No	No	No	No	Yes	No	No
15	2	1079	1	42	No	No	No	No	No	No	No	Yes	No	No
16	2	755	1	29	No	No	No	No	No	No	No	No	No	No
17	2	432	1	17	No	No	No	No	No	No	No	No	No	No
18	2	432	1	17	No	No	No	No	No	No	No	No	No	No
19	2	243	1	9	No	No	No	No	No	No	No	No	No	No
20	2	135	1	5	No	No	No	No	No	No	No	No	No	No
21	2	81	1	3	No	No	No	No	No	No	No	No	No	No
22	2	27	1	1	No	No	No	No	No	No	No	No	No	No
23	2	27	1	1	No	No	No	No	No	No	No	No	No	No
24	2	27	1	1	No	No	No	No	No	No	No	No	No	No
Hours Met					0	0	0	4	7	11	13	15	11	7

Warrant 3 Condition A

Orientation	E	W
Total Stopped Delay Per Vehicle on Minor Approach (s)	9153.8	3349.9
Number of Lanes on Minor Street Approach	1	1
VehicleHours of Stopped Delay on Minor Approach ([h]h:mm)	73:44	96:46
Delay Condition Met	Yes	Yes
Volume on Minor Street Approach During Same Hour	29	104
High Minor Volume Condition Met	No	Yes
Total Entering Volume on All Approaches During Same Hour	2832	2832
Number of Approaches on Intersection	4	4
Total Volume Condition Met	Yes	Yes
Warrant Met for Approach	No	Yes
Warrant Met for Intersection	**Yes**	

Signal Warrants Report For Intersection 7: Pipeline Avenue at Woodview Road

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	Yes
#2	Four Hour Vehicular Volume	Yes
#3	Peak Hour	No

Intersection Warrants Parameters

Major Approaches	S, N
Minor Approaches	W
Speed > 40mph	No
Population < 10,000	No
Warrant Factor	100%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets
	S	N	W
1	477	547	244
2	463	531	237
3	453	520	232
4	425	487	217
5	377	432	193
6	372	427	190
7	367	421	188
8	334	383	171
9	329	377	168
10	324	372	166
11	281	323	144
12	262	301	134
13	258	295	132
14	191	219	98
15	191	219	98
16	134	153	68
17	76	88	39
18	76	88	39
19	43	49	22
20	24	27	12
21	14	16	7
22	5	5	2
23	5	5	2
24	5	5	2

Warrant Analysis by Hour

Hour	Major Streets		Minor Street		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	1	1024	1	244	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
2	1	994	1	237	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
3	1	973	1	232	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
4	1	912	1	217	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
5	1	809	1	193	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
6	1	799	1	190	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
7	1	788	1	188	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
8	1	717	1	171	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	No	No
9	1	706	1	168	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	No	No
10	1	696	1	166	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	No	No
11	1	604	1	144	No	Yes	Yes	Yes	No	Yes	Yes	Yes	No	No
12	1	563	1	134	No	Yes	Yes	Yes	No	No	Yes	Yes	No	No
13	1	553	1	132	No	Yes	Yes	Yes	No	No	Yes	Yes	No	No
14	1	410	1	98	No	No	No	Yes	No	No	No	No	No	No
15	1	410	1	98	No	No	No	Yes	No	No	No	No	No	No
16	1	287	1	68	No	No	No	No	No	No	No	No	No	No
17	1	164	1	39	No	No	No	No	No	No	No	No	No	No
18	1	164	1	39	No	No	No	No	No	No	No	No	No	No
19	1	92	1	22	No	No	No	No	No	No	No	No	No	No
20	1	51	1	12	No	No	No	No	No	No	No	No	No	No
21	1	30	1	7	No	No	No	No	No	No	No	No	No	No
22	1	10	1	2	No	No	No	No	No	No	No	No	No	No
23	1	10	1	2	No	No	No	No	No	No	No	No	No	No
24	1	10	1	2	No	No	No	No	No	No	No	No	No	No
Hours Met					10	13	13	15	7	11	13	13	7	0

Warrant 3 Condition A

Orientation	W
Total Stopped Delay Per Vehicle on Minor Approach (s)	53.2
Number of Lanes on Minor Street Approach	1
VehicleHours of Stopped Delay on Minor Approach ([h]h:mm)	3:36
Delay Condition Met	No
Volume on Minor Street Approach During Same Hour	244
High Minor Volume Condition Met	Yes
Total Entering Volume on All Approaches During Same Hour	1268
Number of Approaches on Intersection	3
Total Volume Condition Met	Yes
Warrant Met for Approach	No
Warrant Met for Intersection	**No**

Signal Warrants Report For Intersection 8: Pipeline Avenue at Soquel Canyon Parkway

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	Yes
#2	Four Hour Vehicular Volume	Yes
#3	Peak Hour	Yes

Intersection Warrants Parameters

Major Approaches	E, W
Minor Approaches	N
Speed > 40mph	Yes
Population < 10,000	No
Warrant Factor	70%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets
	E	W	N
1	686	279	474
2	665	271	460
3	652	265	450
4	611	248	422
5	542	220	374
6	535	218	370
7	528	215	365
8	480	195	332
9	473	193	327
10	466	190	322
11	405	165	280
12	377	153	261
13	370	151	256
14	274	112	190
15	274	112	190
16	192	78	133
17	110	45	76
18	110	45	76
19	62	25	43
20	34	14	24
21	21	8	14
22	7	3	5
23	7	3	5
24	7	3	5

Warrant Analysis by Hour

Hour	Major Streets		Minor Street		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	4	965	1	474	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
2	4	936	1	460	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
3	4	917	1	450	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
4	4	859	1	422	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes
5	4	762	1	374	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes
6	4	753	1	370	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes
7	4	743	1	365	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes
8	4	675	1	332	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Yes	Yes
9	4	666	1	327	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Yes	Yes
10	4	656	1	322	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Yes	Yes
11	4	570	1	280	No	Yes	Yes	Yes	No	No	No	Yes	Yes	Yes
12	4	530	1	261	No	Yes	Yes	Yes	No	No	No	Yes	Yes	No
13	4	521	1	256	No	Yes	Yes	Yes	No	No	No	Yes	Yes	No
14	4	386	1	190	No	No	No	Yes	No	No	No	No	No	No
15	4	386	1	190	No	No	No	Yes	No	No	No	No	No	No
16	4	270	1	133	No	No	No	No	No	No	No	No	No	No
17	4	155	1	76	No	No	No	No	No	No	No	No	No	No
18	4	155	1	76	No	No	No	No	No	No	No	No	No	No
19	4	87	1	43	No	No	No	No	No	No	No	No	No	No
20	4	48	1	24	No	No	No	No	No	No	No	No	No	No
21	4	29	1	14	No	No	No	No	No	No	No	No	No	No
22	4	10	1	5	No	No	No	No	No	No	No	No	No	No
23	4	10	1	5	No	No	No	No	No	No	No	No	No	No
24	4	10	1	5	No	No	No	No	No	No	No	No	No	No
Hours Met					10	13	13	15	3	7	10	13	13	11

Warrant 3 Condition A

Orientation	N
Total Stopped Delay Per Vehicle on Minor Approach (s)	48.3
Number of Lanes on Minor Street Approach	1
VehicleHours of Stopped Delay on Minor Approach ([h]h:mm)	6:21
Delay Condition Met	Yes
Volume on Minor Street Approach During Same Hour	474
High Minor Volume Condition Met	Yes
Total Entering Volume on All Approaches During Same Hour	1439
Number of Approaches on Intersection	3
Total Volume Condition Met	Yes
Warrant Met for Approach	Yes
Warrant Met for Intersection	**Yes**

Signal Warrants Report For Intersection 12: Carbon Canyon Road at Fairway Drive/Ginseng Lane

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	No
#2	Four Hour Vehicular Volume	No
#3	Peak Hour	No

Intersection Warrants Parameters

Major Approaches	S, N
Minor Approaches	E, W
Speed > 40mph	Yes
Population < 10,000	No
Warrant Factor	70%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets	
	S	N	E	W
1	2115	956	0	61
2	2052	927	0	59
3	2009	908	0	58
4	1882	851	0	54
5	1671	755	0	48
6	1650	746	0	48
7	1629	736	0	47
8	1481	669	0	43
9	1459	660	0	42
10	1438	650	0	41
11	1248	564	0	36
12	1163	526	0	34
13	1142	516	0	33
14	846	382	0	24
15	846	382	0	24
16	592	268	0	17
17	338	153	0	10
18	338	153	0	10
19	190	86	0	5
20	106	48	0	3
21	63	29	0	2
22	21	10	0	1
23	21	10	0	1
24	21	10	0	1

Warrant Analysis by Hour

Hour	Major Streets		Minor Street		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	2	3071	2	61	No	No	No	No	No	No	No	Yes	No	No
2	2	2979	2	59	No	No	No	No	No	No	No	Yes	No	No
3	2	2917	2	58	No	No	No	No	No	No	No	Yes	No	No
4	2	2733	2	54	No	No	No	No	No	No	No	No	No	No
5	2	2426	2	48	No	No	No	No	No	No	No	No	No	No
6	2	2396	2	48	No	No	No	No	No	No	No	No	No	No
7	2	2365	2	47	No	No	No	No	No	No	No	No	No	No
8	2	2150	2	43	No	No	No	No	No	No	No	No	No	No
9	2	2119	2	42	No	No	No	No	No	No	No	No	No	No
10	2	2088	2	41	No	No	No	No	No	No	No	No	No	No
11	2	1812	2	36	No	No	No	No	No	No	No	No	No	No
12	2	1689	2	34	No	No	No	No	No	No	No	No	No	No
13	2	1658	2	33	No	No	No	No	No	No	No	No	No	No
14	2	1228	2	24	No	No	No	No	No	No	No	No	No	No
15	2	1228	2	24	No	No	No	No	No	No	No	No	No	No
16	2	860	2	17	No	No	No	No	No	No	No	No	No	No
17	2	491	2	10	No	No	No	No	No	No	No	No	No	No
18	2	491	2	10	No	No	No	No	No	No	No	No	No	No
19	2	276	2	5	No	No	No	No	No	No	No	No	No	No
20	2	154	2	3	No	No	No	No	No	No	No	No	No	No
21	2	92	2	2	No	No	No	No	No	No	No	No	No	No
22	2	31	2	1	No	No	No	No	No	No	No	No	No	No
23	2	31	2	1	No	No	No	No	No	No	No	No	No	No
24	2	31	2	1	No	No	No	No	No	No	No	No	No	No
Hours Met					0	0	0	0	0	0	0	3	0	0

Warrant 3 Condition A

Orientation	E	W
Total Stopped Delay Per Vehicle on Minor Approach (s)	689.2	3879.6
Number of Lanes on Minor Street Approach	1	2
VehicleHours of Stopped Delay on Minor Approach ([h]h:mm)	0:00	65:44
Delay Condition Met	No	Yes
Volume on Minor Street Approach During Same Hour	0	61
High Minor Volume Condition Met	No	No
Total Entering Volume on All Approaches During Same Hour	3132	3132
Number of Approaches on Intersection	4	4
Total Volume Condition Met	Yes	Yes
Warrant Met for Approach	No	No
Warrant Met for Intersection	**No**	

Signal Warrants Report For Intersection 13: Carbon Canyon Road at Canyon Hills Road

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	No
#2	Four Hour Vehicular Volume	Yes
#3	Peak Hour	No

Intersection Warrants Parameters

Major Approaches	S, N
Minor Approaches	E, W
Speed > 40mph	Yes
Population < 10,000	No
Warrant Factor	70%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets	
	S	N	E	W
1	2143	923	19	70
2	2079	895	18	68
3	2036	877	18	67
4	1907	821	17	62
5	1693	729	15	55
6	1672	720	15	55
7	1650	711	15	54
8	1500	646	13	49
9	1479	637	13	48
10	1457	628	13	48
11	1264	545	11	41
12	1179	508	10	39
13	1157	498	10	38
14	857	369	8	28
15	857	369	8	28
16	600	258	5	20
17	343	148	3	11
18	343	148	3	11
19	193	83	2	6
20	107	46	1	4
21	64	28	1	2
22	21	9	0	1
23	21	9	0	1
24	21	9	0	1

Warrant Analysis by Hour

Hour	Major Streets		Minor Street		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	2	3066	1	70	No	No	No	No	No	Yes	Yes	Yes	Yes	No
2	2	2974	1	68	No	No	No	No	No	Yes	Yes	Yes	Yes	No
3	2	2913	1	67	No	No	No	No	No	Yes	Yes	Yes	Yes	No
4	2	2728	1	62	No	No	No	No	No	Yes	Yes	Yes	Yes	No
5	2	2422	1	55	No	No	No	No	No	No	Yes	Yes	No	No
6	2	2392	1	55	No	No	No	No	No	No	Yes	Yes	No	No
7	2	2361	1	54	No	No	No	No	No	No	Yes	Yes	No	No
8	2	2146	1	49	No	No	No	No	No	No	No	Yes	No	No
9	2	2116	1	48	No	No	No	No	No	No	No	Yes	No	No
10	2	2085	1	48	No	No	No	No	No	No	No	Yes	No	No
11	2	1809	1	41	No	No	No	No	No	No	No	No	No	No
12	2	1687	1	39	No	No	No	No	No	No	No	No	No	No
13	2	1655	1	38	No	No	No	No	No	No	No	No	No	No
14	2	1226	1	28	No	No	No	No	No	No	No	No	No	No
15	2	1226	1	28	No	No	No	No	No	No	No	No	No	No
16	2	858	1	20	No	No	No	No	No	No	No	No	No	No
17	2	491	1	11	No	No	No	No	No	No	No	No	No	No
18	2	491	1	11	No	No	No	No	No	No	No	No	No	No
19	2	276	1	6	No	No	No	No	No	No	No	No	No	No
20	2	153	1	4	No	No	No	No	No	No	No	No	No	No
21	2	92	1	2	No	No	No	No	No	No	No	No	No	No
22	2	30	1	1	No	No	No	No	No	No	No	No	No	No
23	2	30	1	1	No	No	No	No	No	No	No	No	No	No
24	2	30	1	1	No	No	No	No	No	No	No	No	No	No
Hours Met					0	0	0	0	0	4	7	10	4	0

Warrant 3 Condition A

Orientation	E	W
Total Stopped Delay Per Vehicle on Minor Approach (s)	1262.4	5338.3
Number of Lanes on Minor Street Approach	1	1
VehicleHours of Stopped Delay on Minor Approach ([h]h:mm)	6:39	103:48
Delay Condition Met	Yes	Yes
Volume on Minor Street Approach During Same Hour	19	70
High Minor Volume Condition Met	No	No
Total Entering Volume on All Approaches During Same Hour	3155	3155
Number of Approaches on Intersection	4	4
Total Volume Condition Met	Yes	Yes
Warrant Met for Approach	No	No
Warrant Met for Intersection	**No**	

APPENDIX O: VMT MEMO

TECHNICAL MEMORANDUM

2 Executive Circle
Suite 250
Irvine, CA 92614
949.825.6175 T
949.825.5939 F
www.llgengineers.com

Pasadena
Irvine
San Diego

To:	Michael Hofflinger, Planning Manager City of Chino Hills Community Development Department	Date:	November 4, 2024
From:	Richard Barretto, P.E., Principal Zawwar Saiyed, P.E., Associate Principal Yi Li, Transportation Engineer II Linscott, Law and Greenspan, Engineers	LLG Ref:	2.22.4452.1
Subject:	***Chino Hills General Plan Update Vehicle Miles Traveled (VMT) Analysis*** ***Chino Hills, California***		

As requested, Linscott, Law & Greenspan, Engineers (LLG) is pleased to submit this Vehicle Miles Traveled (VMT) Analysis Technical Memorandum for the proposed Chino Hill General Plan Update project (herein after referred to as "Project") in the City of Chino Hills, San Bernardino County, California. This Technical Memorandum presents the VMT screening criteria, analysis methodology, significance thresholds and VMT analysis.

It should be noted that the approach and methodology outlined in this Technical Memorandum are consistent with the *City of Chino Hills Administrative Policies and Procedures Manual, Vehicle Miles Traveled (VMT) Guidelines Implementation Policy (adopted on 4/26/2022)*, which provides additional detail on the language and analysis procedures described in this Technical Memorandum.

The following sections of this Technical Memorandum present the Project Description, Terminology, Project Site Level Analysis, Land Use Plan Level Analysis, and Conclusion.

David S. Shender, PE
John A. Boarman, PE
Richard E. Barretto, PE
Keil D. Maberry, PE
KC Yellapu, PE
Dave Roseman, PE
Shankar Ramakrishnan, PE
An LGZWB Company Founded 1966

TERMINOLOGY

This section presents the terminology used in this Technical Memorandum:

- **RHNA**: Regional Housing Needs Assessment
- **CEQA**: The California Environmental Quality Act
- **ITE**: Institute of Transportation Engineers
- **CAPCOA**: California Air Pollution Control Officers Association
- **SCAG**: Southern California Association of Governments
- **RTP**: Regional Transportation Plan
- **SCS**: Sustainable Communities Strategy
- **TDM**: Travel Demand Management
- **VMT**: Vehicle Miles Traveled
- **GHG**: Greenhouse Gas
- **SBTAM**: San Bernardino County Transportation Analysis Model
- **TAZ**: Traffic Analysis Zone
- **SED**: Socio-Economic Data
- **Baseline**: SBTAM Existing Year 2016 Model Scenario
- **Baseline Condition**: Unmodified SBTAM Baseline (without Project Scenario)
- **Baseline Plus Project**: Modified SBTAM Baseline (with Project Scenario)
- **Cumulative**: SBTAM Future Year 2040 Model Scenario
- **Cumulative Condition**: Unmodified SBTAM Cumulative (Current General Plan)
- **Cumulative Plus Project**: Modified SBTAM Cumulative (Proposed General Plan)

PROJECT DESCRIPTION

The Project in an update of the City of Chino Hills 2015 General Plan to accommodate land use changes promulgated by the City of Chino Hills 6th Cycle Housing Element; to address other changes to the General Plan required by state law; and to incorporate contemporary General Plan information regarding existing conditions and applicable planning documents.

The Project also includes revisions to the City's Zoning Code and Zoning Map, The Shoppes at Chino Hills Specific Plan (SP04-01) (Shoppes Specific Plan), The Commons at Chino Hills Specific Plan (SP06-01 (Commons Specific Plan), along with updates to the Safety Element, Circulation Element, Parks, Recreation and Open Space Element, Land Use Element, Conservation Element, Noise Element, and Economic Development Element; and approval of the 2020 Parks Master Plan.

This VMT analysis provides a land use plan level review of each of the Project components, including:

- General Plan General Plan and Land Use Map (22GPA02)
- Zoning Map (22ZC02)
- Municipal Code Amendment to Chapter 16.02 (22MCAxx)
- Approval of the Parks and Recreation Master Plan.

In addition, the VMT analysis provides a project site level review for eleven (11) housing sites identified in the Housing Element to meet the City's designated share of Regional Housing Needs Assessment (RHNA) Extremely Low, Very Low, Low and Moderate Income housing, and will require a General Plan Land Use Map change. ***Table 1*** summarizes the information for the eleven (11) RHNA sites based on a review of the Project information provided by the City. ***Figure 1*** presents a Vicinity Map that illustrates the general location of the RHNA sites and surrounding street system.

Figure 2 illustrates the Current Chino Hills General Plan Land Use Map, inclusive of location of the eleven (11) RHNA sites and current land use designation. A summary of the description of the eleven (11) RHNA sites is provided below.

Site 1 – The Shoppes II

Approved under Specific Plan 04-01, the Shoppes II is a City-owned site zoned for high density residential and commercial. Although the site is zoned for high density residential, the approved specific plan caps the site at 295 units, therefore, the site will need to be rezoned to increase unit cap amount to meet lower RHNA. The small southern portion of Shoppes II site was included in previous RHNA cycles and remained vacant. The site is flat and situated between the existing

Shoppes commercial center to the north, Chino Valley Fire District Station 62 to the south, City Hall and parking structure to the west and Boys Republic to the east. The site contains no environmental constraints and includes proper infrastructure surrounding the site ready for residential development as shown below:

- Allocated Units – 744
- Density – 93.0 du/ac
- Size – 8.0 ac
- Current General Plan – High Density Residential
- Current Zoning – Specific Plan 04-01 Mixed Use
- Use – Vacant
- Constraints – None
- Proposed General Plan – Very High Density Overlay
- Proposed Zone – Specific Plan 04-01 (Very High Density Overlay)
- Minimum Density – 93 du/ac

Site 2 – Community Park Overflow

Approved under Specific Plan 04-01, the Community Park overflow is a City-owned site approved for the master planned Community Park and Civic Center. This site is currently used to accommodate overflow parking for the Community Park; however, the site, which is designated a public park, is vacant and underutilized. The City has focused on this site for an affordable senior housing development for several years and committed to applying its Housing In-Lieu fee and available funds to help finance the development of this site. The site is located between Community Park to the north and west, and single-family residential development to the east and south. The site is flat, presents no environmental constraints, and includes proper infrastructure surrounding the site ready for residential development as shown below:

- Allocated Units – 50
- Density – 27.8 du/ac
- Size – 1.8 ac
- Current General Plan – Public Park
- Current Zoning – Specific Plan 04-01 (Community Park)
- Use – Vacant
- Constraints – None
- Proposed General Plan – Very High Density Overlay
- Proposed Zoning – RM-3 or equivalent

- Minimum Density – 27.8 du/ac

Site 3 – Los Serranos Golf Course

This is a 9-hole area of an existing 36-hole golf course that is now designated as commercial recreation. The golf course is surrounded by single-family residential development which serves local and regional communities and includes a driving range and country club. The golf course has been underperforming in recent years, and the property owner has been actively pursuing converting the southernmost 9-hole area into housing. The property owner has submitted a preliminary concept site plan that includes two very high-density sites: Planning Area (PA) IV containing 315 units on 12.6 acres and PA V containing 217 units on 8.69 acres, for a total of 532 high density units.

The property owner has worked with a golf course designer to redevelop the 36-hole into an 18-hole golf course and a 9-hole course, leaving the remaining 9-hole site for housing development. The property owner's efforts to redesign the golf course, provide a preliminary concept plan for housing and keen interest demonstrates that the proposed number of high-density units is both achievable and likely to occur during this planning period.

The high-density portion of this property would be rezoned to Very High Density Overlay to allow for owner-occupied and rental multifamily units. A complete application for this Project and its subsequent development is expected during this 6th Cycle planning period as shown below:

- Allocated Units – 532
- Density – Parcel A - 25du/ac, Parcel B – 24.9 du/ac
- Size – Parcel A – 12.6 ac, Parcel B 8.6 ac, Total 21.3 ac
- Current General Plan – Commercial Recreation
- Current Zoning – Commercial Recreation (C- R)
- Use – Golf Course
- Constraints – Blue Line Stream
- Proposed General Plan – Very High Density Overlay
- Proposed Zoning – Very High Density Housing Overlay
- Minimum Density – 25 du/ac

Site 4 – Western Hills Golf Course

Western Hills Golf Course is an 18-hole course established in the early 1960's to serve the local and regional communities and includes a country club. The golf course is located within Carbon Canyon and is surrounded by single-family residential development. In recent years, the golf

course has underperformed, and the owner seeks to redevelop the south section of the golf course (which includes clubhouse, parking, and large open grass areas) to residential development and redesign the balance of the golf course for continued golf use. City staff worked closely with the property owner and developer to evaluate the site and determine a feasible location to accommodate high density development. The property owner has submitted a preliminary conceptual plan to develop this site with high density residential. Although the golf course is larger than 10 acres, the Project will include a parcel map with entitlements to subdivide into a smaller parcel of adequate size to accommodate high density for lower RHNA. The site is flat, presents no environmental constraints, and includes proper infrastructure surrounding the site ready for residential development. The property owner has indicated intent to use the proceeds from the sale of the housing site to redesign and construct a new club house.

- Allocated Units – 187
- Density – 20.0 du/ac
- Size – 8.3 ac
- Current General Plan – Commercial Recreation
- Current Zoning – Commercial Recreation (C- R)
- Current General Plan – Commercial Recreation
- Use – Golf Course
- Constraints – None
- Proposed General Plan – Very High Density Overlay
- Proposed Zoning – Very High Density Housing Overlay
- Minimum Density – 20 du/ac

Site 5 – Wang (High Density)

The Wang property is a vacant residentially zoned (rural residential) property surrounded by single-family residential to the north and west, vacant property to the south, and Los Serranos Golf Course to the east. The site contains steep topography on the southern half of the property, while the northern half presents slopes less than ten percent directly along Woodview Road. The site also contains a blue line stream along the western portion of the property. Although the site contains areas of steep topography, the mild slope portions can accommodate development for high density residential. City staff worked closely with the property owner and developer to evaluate the site and determine a feasible location to accommodate high density development. Development of this site will re-align Woodview Road to enhance public safety and traffic circulation. Although the property is larger than 10 acres, the Project will include a parcel map with entitlements to subdivide into a smaller parcel of adequate size to accommodate high

density for lower RHNA. The property includes proper infrastructure surrounding the site ready for residential development as shown below:

- Allocated Units – 148
- Density – 20.3 du/ac
- Size – 7.3 ac
- Current General Plan – Rural Residential
- Current Zoning – Rural Residential (R-R)
- Use – Vacant
- Constraints – Blue Line Stream, mild topography
- Proposed General Plan – Very High Density Overlay
- Proposed Zoning – Very High Density Housing Overlay
- Minimum Density – 20.3 du/ac

Site 6 – The Shoppes

The Shoppes is an existing 391,863-square foot commercial center surrounded by the Shoppes II site and City Hall to the south, Boys Republic to the east, commercial center and single-family residential to the west and commercial center to the north. Currently, the center is 86% occupied which includes approximately 5% of lease square footage based on annual renewals. Additionally, the center includes an anchor building underutilized and current tenant seeks to downsize to a more efficient tenant space for the use. The property owner intends to redevelop the underutilized southeastern section of the commercial center to a mixed-use development that will retain retail space and include high density residential. Although the commercial center is larger than 10 acres, the Project will include a parcel map with entitlements to subdivide into a smaller parcel of adequate size to accommodate high density for lower RHNA. The site is flat, presents no environmental constraints, and includes proper infrastructure surrounding the site ready for residential development as shown below:

- Allocated Units – 267
- Density – 46.8 du/ac
- Size – 5.7 ac
- Current General Plan – Commercial
- Current Zoning – Specific Plan 04-01 Retail
- Use – Commercial Center
- Constraints – None
- Proposed General Plan – Mixed Use Housing Overlay

- Proposed Zoning – Mixed Use Housing Overlay
- Minimum Density – 46.8 du/ac

Site 7 – The Commons

The Commons is an existing 443,272-square foot commercial center surrounded by a mobile home park to the east, single-family and multi-family residential to the west, an existing commercial center and commercial office zoned vacant land to the north within the City of Chino. Currently, the center is largely underutilized and experienced significant vacancies. One of the major tenant spaces (former Toys r Us), which encompasses 12% (63,339 sq. ft.) of the total square footage for the center, has remained vacant for several years. In addition, the undeveloped pad adjacent to the former Toys r Us space, is entitled for two additional buildings totaling 41,500 sq. ft., which encompasses 8 of total square feet, has failed to begin construction to lease at economical rents. The area to redevelop comprises of 20% of total building square footage for the center. The property owner intends to redevelop the underutilized portion of the commercial center by developing a mixed-use Project to retain retail square footage and include high density residential. The property owner has also supplied the City with a letter of intent to redevelop the underutilized portion of the center to include high density residential. Although the commercial center is larger than 10 acres, the Project will include a parcel map with entitlements to subdivide into a smaller parcel of adequate size to accommodate high density for lower RHNA. The site is flat, presents no environmental constraints, and includes proper infrastructure surrounding the site ready for residential development as shown below:

- Allocated Units – 300
- Density – 33.3 du/ac
- Size – 9.0 ac
- Current General Plan – Commercial
- Current Zoning – Specific Plan 06-01 Commercial
- Use – Commercial Center
- Constraints – None
- Proposed General Plan – Mixed Use Housing Overlay
- Proposed Zoning – Mixed Use Housing Overlay
- Minimum Density – 33.5 du/ac

Site 8 – Canyon Estates (Medium Density)

The Canyon Estates property is located at the terminus of Soquel Canyon Parkway and is surrounded by single-family residential and the vacant Wang site to the north, single-family residential to the west and east, and Chino Hills State Park to the south. The site includes steep

topography on the north and south sections of the property and centered with slopes less than ten percent where development can occur. City staff worked closely with the property owner and developer to evaluate the site and determine a feasible location to accommodate medium density development. Development of the property will also include key infrastructure as part of the City's circulation element as shown below:

- Allocated Units – 163
- Density – 12 du/ac
- Size – 13.3 ac
- Current General Plan – Agriculture/Ranches
- Current Zoning – Planned Development 19-161
- Current General Plan – Agriculture/Ranches
- Use – Vacant
- Constraints – Topography
- Proposed General Plan – Medium Density Housing Overlay
- Proposed Zoning – Medium Density Housing Overlay
- Minimum Density – 12.0 du/ac

Site 9 – Wang (Medium Density)

The Wang property is a vacant residentially zoned property surrounded by single-family residential to the north and west, vacant property to the south, and Los Serranos Golf Course to the east. The site contains steep topography on the southern half of the property, while the northern half presents slopes less than ten percent directly along Woodview Road. The site also contains a blue line stream along the western portion of the property. Although the site contains areas of steep topography, the mild slope portions can accommodate development for high density residential. City staff worked closely with the property owner and developer to evaluate the site and determine a feasible location to accommodate high density development. Development of this site will re-align Woodview Road to enhance public safety and traffic circulation. The property includes proper infrastructure surrounding the site ready for residential development as shown below:

- Allocated Units – 272
- Density – 9.0 du/ac
- Size – 30.5 ac
- Current General Plan – Rural Residential
- Current Zoning – Rural Residential (R-R)

- Use – Vacant
- Constraints – Blue Line Stream, mild topography
- Proposed General Plan – Medium Density Housing Overlay
- Proposed Zoning – Medium Density Housing Overlay
  Minimum Density – 9.0 du/ac

Site 10 – Canyon Estates (Low Density)

The Canyon Estates property is located at the terminus of Soquel Canyon Parkway and is surrounded by single-family residential and the vacant Wang site to the north, single-family residential to the west and east, and Chino Hills State Park to the south. The site includes steep topography on the north and south sections of the property and centered with slopes less than ten percent where development can occur. For this development component of Canyon Estates property, up to 166 single family residential units are proposed, consistent with a low density development. Development of the property will also include key infrastructure as part of the City's circulation element.

- Allocated Units – 166
- Density – 6 du/ac
- Size – 31.0 ac
- Current General Plan – Rural Residential
- Current Zoning – Planned Development 19-161
- Use – Vacant
- Constraints – Topography
- Proposed General Plan – Low Density Housing Overlay
- Proposed Zoning – Low Density Housing Overlay
- Minimum Density – 6.0 du/ac

Site 11 – Los Serranos Golf Course (Low Density)

The 6.9-acre site of the Los Serranos Golf Course (PA II) is located along the east side of Pipeline Avenue south of Woodview Road intersection just west of the proposed Site 3. This is a 9-hole area of an existing 36-hole golf course that is now designated as commercial recreation. The golf course is surrounded by single-family residential development which serves local and regional communities and includes a driving range and country club. The golf course has been underperforming in recent years, and the property owner has been actively pursuing converting the southernmost 9-hole area into housing. The site is proposed to include 41 single family residential units: Planning Area (PA) II, consistent with a low density development.

- Allocated Units – 41

- Density – 6.0 du/ac
- Size – 6.9 ac
- Current General Plan – Rural Residential
- Current Zoning – Commercial Recreation (C- R)
- Use – Golf Course
- Proposed General Plan – Low Density Housing Overlay
- Proposed Zoning – Low Density Housing Overlay
- Minimum Density – 6.0 du/ac

Figure 3 illustrates the Proposed Chino Hills General Plan Land Use Map, inclusive of location of the eleven (11) RHNA sites and their proposed land use designation, which would either be Very High Density Overlay, Mixed-Use Overlay Housing, or Medium Density Overlay, as well as Low Density.

PROJECT SITE LEVEL ANALYSIS

This section presents a project site level review of each of the eleven (11) RHNA sites that will be re-designated and re-zoned pursuant to the Project.

Project Site Screening Criteria

Under the VMT methodology, screening is used to determine if a Project will be required to conduct a detailed VMT analysis. The following section discusses the various screening methods recommended by the *City of Chino Hills Administrative Policies and Procedures Manual, Vehicle Miles Traveled (VMT) Guidelines Implementation Policy,* and whether the project site will screen out, either in its entirety, or partially based on individual land uses, or in this case individual RHNA sites.

Figure 4 presents the Traffic Analysis Zones (TAZ) Map from the San Bernardino County Transportation Analysis Model (SBTAM) with the location of the eleven (11) project sites as listed below:

Table A. RHNA Sites and TAZ Mapping

Site	RHNA Site	TAZ
1.	The Shoppes II	53603201
2.	Community Park Overflow	53603301
3.	Los Serranos Golf Course	53614501
4.	Western Hills Golf Course	53598201
5.	Wang (High Density)	53609101
6.	The Shoppes	53603201
7.	The Commons	53614201
8.	Canyon Estates (Medium Density)	53609101
9.	Wang (Medium Density)	53609101
10	Canyon Estates (Low Density)	53609101
11.	Los Serranos Golf Course (Low Density)	53614501

Screening Criterion #1: Small Projects

The *City of Chino Hills Administrative Policies and Procedures Manual, Vehicle Miles Traveled (VMT) Guidelines Implementation Policy* states:

> *"Absent substantial evidence indicating that a project would generate a potentially significant level of VMT, or inconsistency with a Sustainable Communities Strategy (SCS) or the General Plan, project that generate or attract fewer than 110 trips per day may be assumed to cause a less-than-significant transportation impact."*

As presented in ***Table 2***, the eleven (11) RHNA sites will not screen out since they all generate more than 110 daily trips individually.

Screening Criterion #2: Local-Serving Commercial and Public Facilities, and Affordable Housing

The *City of Chino Hills Administrative Policies and Procedures Manual, Vehicle Miles Traveled (VMT) Guidelines Implementation Policy* states:

> *"The City, in its discretion, will determine a development project's specific land use type. Projects that are considered "local-serving" and "affordable housing" for the purposes of this VMT screening criteria include, without limitation:*
>
> - *Local-serving retail uses of 50,000 square feet (SF) or less (i.e., corresponding to the most current ITE Trip Generation Manual's Land Use Code 800's for "Retail" and/or 900's for "Services")*
> - *Local-serving public facility (i.e., public schools, libraries, post offices, police and fire facilities, local government offices)*
> - *Deed-restricted housing project with 100% of the units corresponding to affordable to lower-income households*
> - *For a project to be local serving, its user (residents, customers, employees, visitors) must primarily be from the local area. If the project is not one or more of the identified land uses (or not considered to fit within any of the land use categories by City staff), the project cannot be screened under Criteria #2. Conversely, if the project is for one or more of the identified land uses, the project can be screened under Criteria #2 and no further analysis for VMT is needed."*

Based on the above, ten (10) of the eleven (11) RHNA sites will not screen-out since they are not local-serving commercial, public facilities or affordable housing.

The one (1) exception is RHNA Site 2 – Community Park Overflow, which has been identified for development of affordable senior housing residential units, and therefore will screen out.

Screening Criterion #3: Low VMT Areas, Mixed-Use Projects, Redevelopment Projects, Previously Entitled Projects, and Project Consistency with City Planning Framework

The *City of Chino Hills Administrative Policies and Procedures Manual, Vehicle Miles Traveled (VMT) Guidelines Implementation Policy* states:

> *"Figures 1 and 2 of Attachment A illustrate the Traffic Analysis Zones (TAZs) which are "Low VMT Areas" (i.e., TAZs with VMT per Capita or Employee that are 15% or less than the City Average) for the City under baseline (Year 2016) conditions. These Low VMT Areas were identified using the current version of SBTAM. Figure 1 compares the VMT per Capita for each TAZ against the City's Average VMT per Capita. Figure 2 is based on a comparison between the VMT per Employee for each TAZ and the City's Average per Employee.*
>
> *Development projects that located in low VMT Areas of the City and incorporate features similar to existing development (i.e., density, mix of uses, transit accessibility) will tend to exhibit similarly low VMT. Based on this, a project located in a Low VMT Area of the City depicted on Figure 1 and 2, and that incorporates features similar to existing development (i.e., density, mix of uses, transit accessibility) would meet the screening criteria and will be presumed to cause a less-than-significant transportation impact. Consequently, the project would not be required to complete a full VMT impact analysis.*
>
> *Mixed-use projects should analyze each land use individually, but must apply credits to account for internal capture (i.e., synergy between uses).*
>
> *For redevelopment projects where the project replaces VMT-generating land uses, the project would not be required to complete a full VMT impact analysis.*
>
> *With regards to a land use project that has an existing entitlement with an approved CEQA document, and requests a modification to the project, if the modified project leads to a net overall decrease in VMT, the project would meet the screening criteria and be presumed to cause a less-than-significant transportation impact.*
>
> *The City General Plan reflects Chino Hill's goals of promoting low VMT development and reducing GHG emissions, and the regional RTP/SCS incorporates the City's General Plan Land Use Map. The map-based screening approach (i.e., determining whether a land use project is located in one of the Low VMT TAZs presented on in Figure 1 and 2 and incorporates features similar to existing development) presumes that the proposed project is consistent with the City's General Plan, applicable specific plans, applicable land use ordinances and regulations, and the adopted Regional Transportation*

Plan/Sustainable Communities Strategy (RTP/SCS). If the project is in conflict with the City's planning framework, a full VMT impact analysis will be required.

Projects that meet the above Screening Criteria #3 are presumed to cause a less-than-significant impact on transportation."

Based on review of *Figure 1* from the *City of Chino Hills Administrative Policies and Procedures Manual, Vehicle Miles Traveled (VMT) Guidelines Implementation Policy*, *Attachment A*, as well as a review of the VMT per Capita for TAZs for the eleven (11) project sites under Baseline (Year 2016) Conditions, four (4) of the eleven (11) RHNA sites are located in a low VMT area of the City of Chino Hills as shown in ***Figure 5*** and presented below**.** Hence, these four (4) of the eleven (11) RHNA sites will screen out.

Table B. RHNA Sites Low VMT TAZ Screening

Site	RHNA Site	TAZ	Screened-Out?
1.	The Shoppes II	53603201	**Yes**
2.	Community Park Overflow	53603301	**Yes**
3.	Los Serranos Golf Course	53614501	No
4.	Western Hills Golf Course	53598201	No
5.	Wang (High Density)	53609101	No
6.	The Shoppes	53603201	**Yes**
7.	The Commons	53614201	**Yes**
8.	Canyon Estates (Medium Density)	53609101	No
9.	Wang (Medium Density)	53609101	No
10	Canyon Estates (Low Density)	53609101	No
11.	Los Serranos Golf Course (Low Density)	53614501	No

Vehicle Miles Traveled (VMT) Analysis Methodology

As required by the *City of Chino Hills Administrative Policies and Procedures Manual, Vehicle Miles Traveled (VMT) Guidelines Implementation Policy*, projects that do not screen-out through the steps above shall complete a full VMT analysis and forecasting utilizing SBTAM to determine the VMT for the project and for the City averages for VMT per Capita (for residential projects or components of a mixed-use development) and/or VMT per Employee (for non-residential projects or components of a mixed-use development). This VMT analysis includes VMT for the project and estimates under the two scenarios listed below:

- Baseline Condition (without Project)
- Baseline Plus Project

Based on the above, a full VMT analysis utilizing SBTAM has been used to determine the VMT for the project sites and for the City of Chino Hills and will provide the following:

- City Average VMT per Capita (Baseline Condition)
- Project VMT per Capita (Baseline Plus Project)

Vehicle Miles Traveled (VMT) Impact Thresholds

As outlined in the *City of Chino Hills Administrative Policies and Procedures Manual, Vehicle Miles Traveled (VMT) Guidelines Implementation Policy* on the application of the VMT impact analysis methodology, a land use project would be considered to result in a significant VMT impact if the following is met:

> *"A land use project results in a significant VMT impact if the project-generated VMT per Capita or Employee exceeds a level of 3% below the City Average VMT per Capita or Employee under existing baseline conditions."*

Vehicle Miles Traveled (VMT) Analysis

Summarized in the section below are the Baseline VMT per Capita values utilizing SBTAM for the City of Chino Hills and the project sites. It should be noted that the Project development totals were converted into Socio-Economic Data (SED) and inputted into the appropriate TAZs for which the RHNA Sites are located within SBTAM for the "Plus Project" conditions. The four (4) RHNA Sites that have been screened out as described in the Project Screening Criteria section are listed below:

Table C. RHNA Sites Screened Out

Site	RHNA Site	TAZ	Screened-Out?
1.	The Shoppes II	53603201	**Yes**
6.	The Shoppes		
2.	Community Park Overflow	53603301	**Yes**
7.	The Commons	53614201	**Yes**

Seven (7) RHNA Sites located within three (3) TAZs cannot be screened out and will be analyzed for VMT impacts. The three (3) TAZs are:

Table D. RHNA Sites Not Screened Out

Site	RHNA Site	TAZ	Screened-Out?
3.	Los Serranos Golf Course	53614501	No
11.	Los Serranos Golf Course (Low Density)		No
4.	Western Hills Golf Course	53598201	No
5.	Wang (High Density)	53609101	No
8.	Canyon Estates (Medium Density)		No
9.	Wang (Medium Density)		No
10	Canyon Estates (Low Density)		No

Table E below presents the VMT values for the three (3) TAZs and the City:

Table E. Baseline (Year 2016) Project Site Level VMT per Capita

Baseline Project VMT per Capita		
Baseline City of Chino Hills VMT/Cap		20.64
3% Below the City of Chino Hills VMT/Cap (Threshold)		**20.02**
TAZ 53614501	Project TAZ VMT	127,571
	Project TAZ Population	6,138
	Project TAZ VMT/Cap	20.78
	Compared to the City of Chino Hills Threshold	**A 3.66% Reduction Needed**
TAZ 53598201	Project TAZ VMT	242,743
	Project TAZ Population	11,111
	Project TAZ VMT/Cap	21.85
	Compared to the City of Chino Hills Threshold	**A 8.38% Reduction Needed**
TAZ 53609101	Project TAZ VMT	313,832
	Project TAZ Population	10,558
	Project TAZ VMT/Cap	29.72
	Compared to the City of Chino Hills Threshold	**A 32.64% Reduction Needed**

As shown above, the Baseline Project VMT per Capita for the seven (7) RHNA Sites located within the three (3) TAZs will range from needing a 3.66% to 32.64% VMT reduction.

Vehicle Miles Traveled (VMT) Mitigation Measures

CEQA requires an environmental impact report to identify feasible alternatives and mitigation measures that could avoid or substantially reduce a project's significant environmental impact. If a significant transportation impact is identified for a project, it will be the Project applicant's responsibility to submit a mitigation measure plan to reduce impacts to less than significant. Options include the provision of on-site transportation infrastructure, on-site transportation demand management, off-site infrastructure improvements including roadway improvements for active transportation and multimodal infrastructure, or off-site multimodal improvements. The Community Development Director or designee will review, make necessary changes and approve the Travel Demand Management (TDM) plan.

Strategies that reduce single occupant automobile trips or reduce travel distance are called TDM strategies. There are several resources for determining the reduction in VMT due to TDM measures such as the California Air Pollution Control Officers Association (CAPCOA) Quantifying Greenhouse Gas Mitigation Measures.

As referenced in the *OPR Technical Advisory*, the California Air Pollution Control Officers Association's *Handbook for Analyzing Greenhouse Gas Emission Reductions, Assessing Climate Vulnerabilities, and Advancing Health and Equity, Designed for Local Government, Communities, and Project Developers* Report, Chapters 3 - Transportation, December 2021, (CAPCOA Report) quantifies the reduction in VMT associated with a particular mitigation measure. The CAPCOA VMT reduction strategies include built environment changes and TDM actions.

The TDM strategies are sub-categorized into the following:

1) Land Use
2) Trip Reduction Program
3) Parking or Road Pricing/Management
4) Neighborhood Design
5) Transit
6) Clean Vehicles and Fuels

It may be noted that there are rules and combined maximums for calculating the VMT reduction when applying multiple mitigation measures. To safeguard the accuracy and reliability of the methods while maintaining their case of use, the following rules should be followed when considering reductions achieved by transportation measures.

Combining Measures Across Scales

According to the CAPCOA, there are sixteen (16) quantified measures at the Project/Site scale that can be combined with each other and seventeen (17) quantified measures at the Plan/Community scale that can be combined with each other. *The GHG reductions of transportation measures from different scales of application should never be combined*.

Combining Measures Within a Subsector

Effectiveness levels for multiple measures within a subsector may be multiplied to determine a combined effectiveness level. The CAPCOA recommends that measures reductions within a subsector be multiplied. This will take the following form:

$$Reduction_{subsector} = 1 - [(1 - A) * (1 - B) * (1 - C)]$$

Where A, B, and C are the individual measures reduction percentages for the measures to be combined in each subsector. In addition, each subsector has a maximum allowable reduction.

Combining Measures Across Subsectors

The CAPCOA report adopts 70 percent as a maximum for the combined VMT impact from the following four subsectors: Land Use, Neighborhood Design, Parking or Road Pricing/Management, and Transit:

$$Reduction_{multi-subsector} = 1\text{-}\,[(1 - Land) * (1 - Design) * (1 - Parking) * (1 - Transit) \leq 70\%$$

Please note that this multi-subsector maximum purposefully excludes the Trip Reduction Program subsector.

General Recommended Mitigation Measures

As mentioned above, the seven (7) RHNA Sites located within the three (3) TAZs are expected to have a VMT impact and will need the applicable mitigation measures. By referring to the CACPOA Report, the following mitigation measures are recommended with the measure's maximum effectiveness in VMT reduction. One or a combination of these mitigation measures could be utilized to partially offset the impact:

- T-3. Provide Transit-Oriented Development (Up to 31.0% Maximum Reduction)
- T-4. Integrate Affordable and Below Market Rate Housing (Up to 28.6% Maximum Reduction)
- T-9. Implement Subsidized or Discounted Transit Program (Up to 5.5% Maximum Reduction)

- T-15. Limit Residential Parking Supply (Up to 13.7% Maximum Reduction)
- T-16. Unbundle Residential Parking Costs from Property Cost (Up to 15.7% Maximum Reduction)
- T-17. Improve Street Connectivity (Up to 30.0% Maximum Reduction)
- T-18. Provide Pedestrian Network Improvement (Up to 6.4% Maximum Reduction)
- T-19-A. Construct or Improve Bike Facility (Up to 0.8% Maximum Reduction)
- T-19-B. Construct or Improve bike Boulevard (Up to 0.2% Maximum Reduction)
- T-20. Expand Bikeway Network (Up to 0.5% Maximum Reduction)
- T-21-A. Implement Conventional Carshare Program (Up to 0.15% Maximum Reduction)
- T-21-B. Implement Electric Carshare Program (Up to 0.18% Maximum Reduction)
- T-22-A. Implement Pedal (Non-Electric) Bikeshare Program (Up to 0.02% Maximum Reduction)
- T-22-B. Implement Electric Bikeshare Program (Up to 0.06% Maximum Reduction)
- T-22-C. Implement Scootershare Program (Up to 0.07% Maximum Reduction)
- T-23. Provide Community-Based Travel Planning (Up to 2.3% Maximum Reduction)
- T-24. Implement Market Price Public Parking (On-Street) (Up to 30.0% Maximum Reduction)
- T-25. Extend Transit Network Coverage or Hours (Up to 4.6% Maximum Reduction)
- T-26. Increase Transit Service Frequency (Up to 11.3% Maximum Reduction)
- T-27. Implement Transit-Supportive Roadway Treatments (Up to 0.6% Maximum Reduction)
- T-28. Provide Bus Rapid Transit (Up to 13.8% Maximum Reduction)
- T-29. Reduce Transit Fare (Up to 1.2% Maximum Reduction)

Recommended Mitigation Measures For Site 4 - Western Hills Golf Course

Site 4 - Western Hills Golf Course is an ongoing application project within the City. The Western Hills Golf Course Project is located in the northwest of Carbon Canyon RD, northeast of Cannon LN, and southwest of fairway DR. The Western Hills Golf Course has 8.79 Acres, and will consist of 187 units as follows:

- 9 Units Studio

- 58 Units 1 Bedroom
- 56 Units 2 Bedroom
- 64 Units 3 Bedroom

405 parking spaces will be provided for the proposed project. Since this is a residential project, there are five (5) potential mitigation measures be applicable for the Site 4 at the Project/Site Scale:

- T-3. Provide Transit-Oriented Development
- T-4. Integrate Affordable and Below Market Rate Housing
- T-9. Implement Subsidized or Discounted Transit Program
- T-15. Limit Residential Parking Supply
- T-16. Unbundle Residential Parking Costs from Property Cost

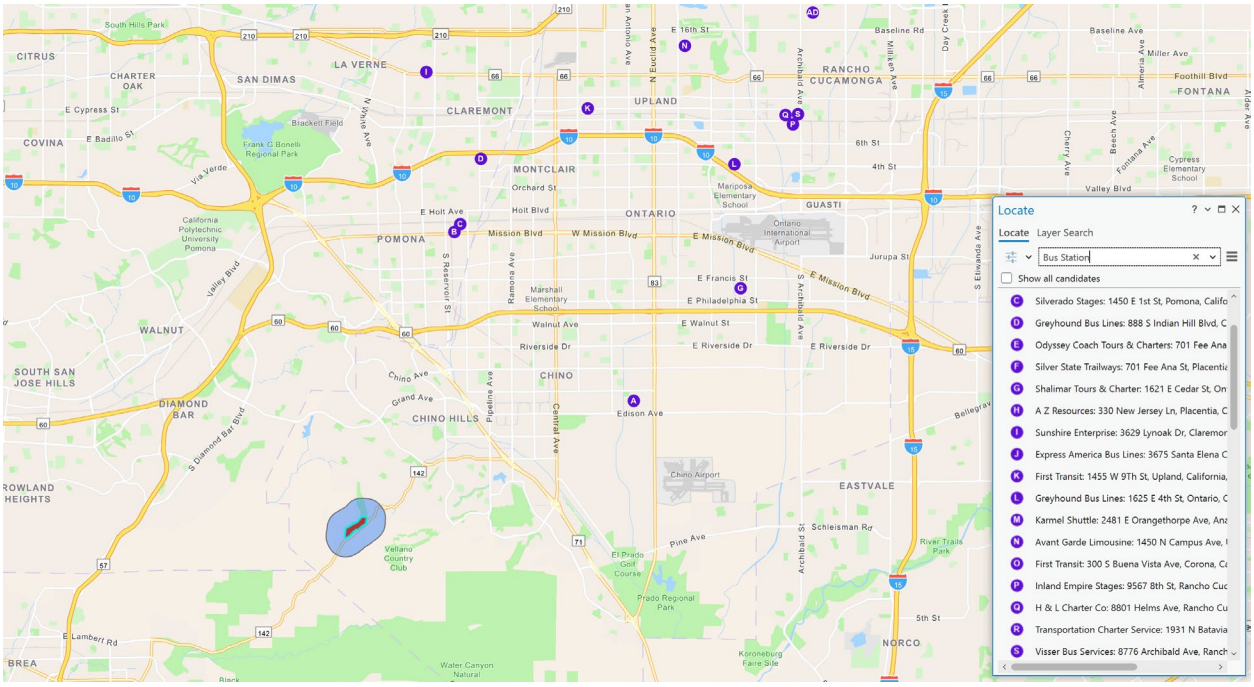
The following section will further discuss each mitigation measure and its applicability in detail.

T-3. Provide Transit-Oriented Development

This measure would reduce project VMT in the study area relative to the same project site in a non-transit-oriented development (TOD) location. TOD refers to projects built in compact, walkable areas that have easy access to public transit, ideally in a location with a mix of uses, including housing, retail offices, and community facilities. Project site residents, employees, and visitors would have easy access to high-quality public transit, thereby encouraging transit ridership and reducing the number of single-occupancy vehicle trips and associated GHG emissions.

To qualify as a TOD, the development must be a residential or office project that is within a 10-minute walk (0.5 mile) of a high frequency transit station (either rail, or bus rapid transit with headways less than 15 minutes).

Screenshot #1 below shows Site 4 – Western Hills Golf Course location and a 0.5 miles buffer (blue area). As shown in *Screenshot #1*, there are no transit stations within 0.5 miles from Site 4 – Western Hills Golf Course, thus Site 4 does not qualify as TOD hence this mitigation measure is not applicable.



Screenshot #1. Transit Stations within 0.5 Miles of Site 4 – Western Hills Golf Course

T-4. Integrate Affordable and Below Market Rate Housing

This measure requires below market rate (BMR) housing. BMR housing provides greater opportunity for lower income families to live closer to job centers and achieve a jobs/housing match near transit. It is also an important strategy to address the limited availability of affordable housing that might force residents to live far away from jobs or school, requiring longer commutes. The quantification method for this measure accounts for VMT reductions achieved for multifamily residential projects that are deed restricted or otherwise permanently dedicated as affordable housing.

Per the CAPCOA implementation requirements, multifamily residential units must be permanently dedicated as affordable for lower income families. The California Department of Housing and Community Development (2021) defines lower-income as 80 percent of area median income or below, and affordable housing as costing 30 percent of gross household income or less.

Since Site 4 – Western Hills Golf Course does not include affordable housing, this mitigation measure is not applicable.

T-9. Implement Subsidized or Discounted Transit

This measure will provide subsidized or discounted, or free transit passes for employees and/or residents. Reducing the out-of-pocket cost for choosing transit improves the competitiveness of transit against driving, increasing the total number of transit trips and decreasing vehicle trips. This decrease in vehicle trips results in reduced VMT and thus a reduction in GHG emissions.

Per the CAPCOA implementation requirements, the project should be accessible either within 1 mile of high-quality transit service (rail or bus with headways of less than 15 minutes), 0.5 mile of local or less frequent transit service, or along a designated shuttle route providing last-mile connections to rail service.

As shown in *Screenshot #1*, there are no transit stations within 0.5 miles from Site 4 – Western Hills Golf Course, CAPCOA.

T-15. Limit Residential Parking

This measure will reduce the total parking supply available at a residential project or site. Limiting the amount of parking available creates scarcity and adds additional time and inconvenience to trips made by private auto, thus disincentivizing driving as a mode of travel. Reducing the convenience of driving results in a shift to other modes and decreased VMT and thus a reduction in GHG emissions. Evidence of the effects of reduced parking supply is strongest for residential developments.

Per the CAPCOA implementation requirements, this measure is ineffective in locations where unrestricted street parking or other offsite parking is available nearby and has adequate capacity to accommodate project-related vehicle parking demand.

Unrestricted street parking within the vicinity of Site 4 – Western Hills Golf Course is available, hence this mitigation measure is not applicable.

T-16. Unbundle Residential Parking Costs from Property Cost

This measure will unbundle, or separate, a residential project's parking costs from property costs, requiring those who wish to purchase parking spaces to do so at an additional cost. On the assumption that parking costs are passed through to the vehicle owners/drivers utilizing the parking spaces, this measure results in decreased vehicle ownership and, therefore, a reduction in VMT and GHG emissions. Unbundling may not be available to all residential developments, depending on funding sources.

Since the parking garages are available for the residents and guest spaces are available for the guests, there are no additional parking costs for the residents, hence this mitigation measure is not applicable.

Project Site Level Analysis Conclusion

Consistent with the *City of Chino Hills Administrative Policies and Procedures Manual, Vehicle Miles Traveled (VMT) Guidelines Implementation Policy* and based on the VMT methodology, criteria, guidelines, analysis, thresholds and results outlined in this Technical Memorandum, the proposed Project will have significant VMT impacts.

Further, based on the mitigation analysis for Site 4 – Western Hills Golf Course, there are no applicable mitigation measures. Thus this project site will have an unmitigable transportation impact.

Details for the other RHNA sites are currently unavailable. It is recommended that once this information becomes available, the City implements appropriate mitigation measures to offset or partially reduce the VMT impacts for the six (6) RHNA sites that were not screened out.

LAND USE PLAN LEVEL ANALYSIS

This section provides a land use plan level review of the proposed Project, evaluating it as a whole, with the eleven (11) RHNA sites considered collectively as a single Project.

The proposed Project is a Citywide land use plan consisting of residential development, as detailed in *Table 1*. Based on the *ITE Trip Generation 11th Edition*, the proposed Project will generate 14,042 trips per day, as shown in *Table 2*. Thus, a Cumulative (Year 2040) land use plan level analysis has been conducted to assess the Project's impact Citywide.

Vehicle Miles Traveled (VMT) Analysis Methodology

A full VMT analysis and forecasting through SBTAM has been conducted to determine the Cumulative VMT for the Project and the City average. The proposed Project in its entirety has been evaluated in the following section. This VMT analysis includes VMT for the project and estimates under the two scenarios listed below:

- Cumulative Condition (Current General Plan)
- Cumulative Plus Project (Proposed General Plan)

As stated in *Section 7.5* of the *City of Chino Hills Administrative Policies and Procedures Manual, Vehicle Miles Traveled (VMT) Guidelines Implementation Policy:*

> *"The VMT impact study approach for evaluating specific land use types other than general land use categories, accounting for unique characteristics related to mixed-use development, amendments to the General Plan and Specific Plan projects that are not screened out, and determining whether an alternative VMT metric (i.e., VMT per Service Population) is considered more appropriate for application, will be evaluated on a case-by-case basis and determined by the Community Development Director."*

Service Population (SP) is defined as the sum of the total population and employment within the study area's zone or zones. VMT per Service Population is a metric used to estimate vehicle miles traveled (VMT) by dividing the total VMT generated by a project by the combined population and employment within the area. This metric assesses transportation impacts by considering not only residents but also employees, and potentially other groups such as students and visitors. It is particularly useful in larger-scale transportation analyses, such as at the city or regional level, as it accounts for various trip-generating activities. In this case, as outlined in the Project Description section, "the proposed Project is an update to the City of Chino Hills 2015 General Plan to accommodate land use changes required by the City of Chino Hills 6th Cycle Housing Element, address other state-mandated General Plan revisions, and incorporate updated information regarding existing conditions and applicable planning documents." Therefore, VMT

per Service Population is deemed the most appropriate metric for the VMT analysis in this instance.

Based on the above, a full VMT analysis utilizing SBTAM has been used to determine the VMT for the Project and for the City of Chino Hills and will provide the following:

- Cumulative Condition (Current General Plan) City Average VMT per Service Population
- Cumulative Plus Project (Proposed General Plan) City Average VMT per Service Population

Vehicle Miles Traveled (VMT) Impact Thresholds

As outlined in the *City of Chino Hills Administrative Policies and Procedures Manual, Vehicle Miles Traveled (VMT) Guidelines Implementation Policy* on the application of the VMT impact analysis methodology, a land use project would be considered to result in a significant VMT impact if the following is met:

> *"A land use project results in a significant VMT impact if the project-generated VMT per Capita or Employee exceeds a level of 3% below the City Average VMT per Capita or Employee under existing baseline conditions."*

Since VMT per Service Population has been used for the proposed land use plan level analysis and no specific threshold for cumulative analysis is identified for this metric in the Guidelines, a threshold of "3% below the City average" has been established for the analysis to ensure consistency with the Guidelines:

- Cumulative Land Use Plan Level VMT per Service Population Threshold

  The proposed Project results in a significant VMT impact if the project-generated VMT per Service Population exceeds a level of 3% below the City Average VMT per Service Population under cumulative conditions.

Vehicle Miles Traveled (VMT) Analysis

Summarized in the section below are the Cumulative VMT per Service Population values utilizing SBTAM for the City of Chino Hills and the Project. It should be noted that the Project development totals were converted into SED and inputted into the appropriate TAZs for which the eleven (11) RHNA sites are located within SBTAM for the "Plus Project" conditions. SED inputs are needed to run the model.

As shown in ***Table F*** below, the Cumulative Plus Project City Average VMT per Service Population is ***3.18%*** less than the Cumulative Condition City Average VMT per Service Population threshold:

Table F. Cumulative (Year 2040) Land Use Plan Level VMT per Service Population

Cumulative Land Use Plan Level VMT per Service Population	
Cumulative Condition City of Chino Hills VMT/SP	33.07
3% Below the City of Chino Hills VMT/SP (Threshold)	**32.08**
Cumulative Plus Project City of Chino Total VMT	3,610,751
Cumulative Plus Project City of Chino Service Population	116,260
Cumulative Plus Project City of Chino VMT/SP	31.06
Compared to the City of Chino Hills Threshold	**3.18% Lower**

Based on the criteria outlined in this report, the Cumulative Land Use Plan Level VMT per Service Population will not exceed the City of Chino Hills threshold. Thus, the proposed Project is presumed to have no significant CEQA-related transportation impact.

Land Use Plan Level Analysis Conclusion

Consistent with the *City of Chino Hills Administrative Policies and Procedures Manual, Vehicle Miles Traveled (VMT) Guidelines Implementation Policy* and based on the VMT methodology, criteria, guidelines, analysis, thresholds and results outlined in this Technical Memorandum, the proposed Project will not have any significant VMT impact. Therefore, the proposed Project is presumed to have a less than significant CEQA related transportation impact.

CONCLUSION

As outlined above in the Baseline Project Site level analysis, when evaluating the proposed Project's eleven (11) RHNA sites individually, four (4) of them can be screened out and are presumed to have no CEQA-related transportation impacts. However, the remaining seven (7) RHNA sites are expected to result in significant impacts. Since the project specifics (excluding Site 4 – Western Hills Golf Course) are not yet available, it is recommended that once this information becomes available, the City implements appropriate mitigation measures to offset or partially reduce the VMT impacts for the six (6) RHNA sites that were not screened out.

Furthermore, at the Cumulative Land Use Plan level, where the eleven (11) RHNA sites are considered as one, the proposed Project is not expected to have any significant VMT impact. As a result, the proposed Project is presumed to have a less-than-significant transportation impact under CEQA.

* * * * * * * * * * *

We appreciate the opportunity to provide this Technical Memorandum. Should you have any questions regarding the memorandum, please contact us at (949) 825-6175.



TABLE 1

PROPOSED HOUSING ELEMENT GENERAL PLAN AMENDMENT AND REZONE SITES[1]

Map ID	RHNA Site	Site Acreage	Current General Plan	Proposed General Plan	Current Zoning	Proposed Zoning and Density (du/ac)	Realistic Site Density Capacity	Unit Count Based on Site Capacity Density
1	Shoppes II	8.0	High Density Residential[a]	Very High Density Housing – Urban[b]	SP 04-01	SP 04-01[c] 30-93 du/ac	93 du/ac	744
2	Community Park Overflow	1.8	Public Park	Very High-Plus Density[d]	SP 04-01	SP-04-01[e] 20-30 du/ac	28 du/ac	50
3	Los Serranos Golf Course: PA IV PA V	12.6 8.7	Commercial Recreation	Very High-Plus Density	CR	Very High-Plus Density[f] 20-30 du/ac	25 du/ac	315 217
4	Western Hills Golf Course	8.3	Commercial Recreation	Very High-Plus Density	CR	Very High-Plus Density 20-30 du/ac	20 du/ac	187
5	Wang	7.3	Rural Residential[g]	Very High Density - Urban	RR	Very High-Plus Density 20-30 du/ac	21 du/ac	148
6	The Shoppes	6.2	Commercial	Mixed Use Housing - Urban	SP 04-01	SP 04-01[h] 30-44 du/ac	43 du/ac	267
7	The Commons	6.9	Commercial	Mixed Use Housing - Urban	SP -06-01	SP 04-01[h] 30-44 du/ac	44 du/ac	300
							Subtotal Lower Income Sites Requiring Rezoning	**2,228**
8	Canyon Estates	13.3	Agriculture/ Ranches[i]	Medium–Plus Density	PD 19-161 (R-A)	Medium-Plus Density[j] 9-13 du/ac	13 du/ac	163
9	Wang	30.5	Rural Residential	Medium-Plus Density	RR	Medium-Plus Density 9-13 du/ac	9 du/ac	272
							Subtotal Moderate Income Sites Requiring Rezoning	**435**

[1] Source*: City of Chino Hills 2021-2029 Housing Element, Appendix B: Candidate Site analysis Planning Period 2021 – 2029, Table B-2 Lower Income Housing Sites by Site No., Name Units and Acres – 6th Cycle RHNA, Units; Table B-3 Lower Income RHNA Allocation Site Detail; Table B-4 Moderate Income Housing Sites by Site No., Name, Units and Acres – 6th Cycle RHNA; City of Chino Hills General Plan Map and Zoning Map.*

TABLE 1 (CONTINUED)

PROPOSED HOUSING ELEMENT GENERAL PLAN AMENDMENT AND REZONE SITES[2]

Map ID	RHNA Site	Site Acreage	Current General Plan	Proposed General Plan	Current Zoning	Proposed Zoning and Density (du/ac)	Realistic Site Density Capacity	Unit Count Based on Site Capacity Density)
10	Canyon Estates	31.0	Agriculture/ Ranches	Low Density Residential	PD 19-161 (RA)	Low Density Residential (R-S)[k] maximum 6 du/ac	6 du/ac	166
11	Los Serranos Golf Course	6.9	Commercial Recreation	Low Density Residential	CR	Low Density Residential (R-S) maximum 6 du/ac	6 du/ac	41
Subtotal Above Moderate Income Sites Requiring Rezoning								**207**
Total Units Requiring Rezoning								**2,870**

Notes:

a. Shoppes Specific Plan currently permits a maximum of 295 high density units.
b. Very High Density Housing -Urban designation provides urban high density adjacent to commercial and civic uses.
c. Shoppes Specific Plan Amendment to Very High Density Housing -1 that allows a minimum density of 30/du units and a maximum of 93 du/ac.
d. Very High-Plus Density Housing is the designation provided to very high density residential sites.
e. Shoppes Specific Plan Amendment to Very High Density Housing -2 that allows a minimum density of 20/du units and a maximum of 30 du/ac affordable senior housing units.
f. Very High-Plus Density Housing Overlay to allow a minimum density of 20/du units and a maximum of 30 du/ac.
g. Rural Residential zoning district allows a maximum of 2 du/ac
h. Shoppes Specific Plan Amendment and The Commons Specific Plan Amendment to Mixed Use Housing - Urban that allows a minimum density of 30/du units and a maximum of 44 du/ac. Medium-Plus Density Housing to allow a minimum density of 9/du units and a maximum of 13 du/ac.
i. Agriculture/Ranches zoning district allows a maximum of 0.5 du/ac
j. Medium-Plus Density Housing allows for a density of 9-13 du/ac.
k. Low Density Residential zoning district allows for a maximum density of 6 du/ac.

Total site area of the Canyon Estates property is approximately 378.65 acres, which under the Agriculture/Ranches designation allows 1

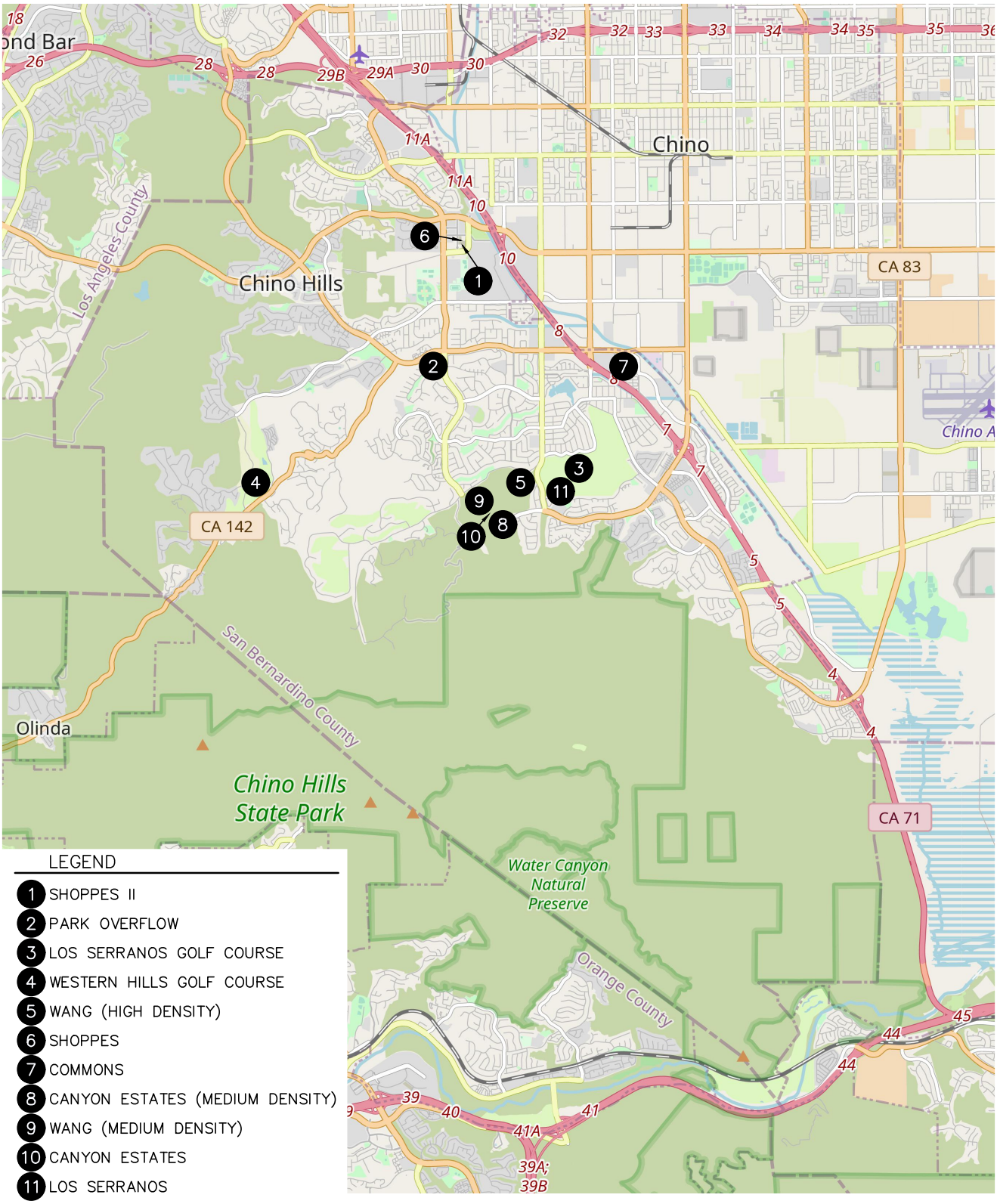
RR = Rural Residential; up to 2 du/ac
CR = Commercial Recreation
SP = Specific Plan
PD = Planned Development
RS = Low Density Residential; up to 6.0 du/ac
RM 2 = High Density Residential; Up to 25 du/ac
RM-3 = Very High Density Residential; Up to 35 du/ac; Default Density allows min. 20 du/ac
MU = Mixed Use; Up to 35 du/ac when associated with a mixed use project featuring a minimum of 100,000 sf of commercial uses

[2] Source*: City of Chino Hills 2021-2029 Housing Element, Appendix B: Candidate Site analysis Planning Period 2021 – 2029, Table B-2 Lower Income Housing Sites by Site No., Name Units and Acres – 6th Cycle RHNA, Units; Table B-3 Lower Income RHNA Allocation Site Detail; Table B-4 Moderate Income Housing Sites by Site No., Name, Units and Acres – 6th Cycle RHNA; City of Chino Hills General Plan Map and Zoning Map.*

TABLE 2
PROJECT TRIP GENERATION RATES AND FORECAST[3]

Description	Daily 2-Way	AM Peak Hour			PM Peak Hour		
		Enter	Exit	Total	Enter	Exit	Total
Trip Generation Rates:							
▪ 220 Single Family Detached Housing (TE/DU)	9.43	26%	74%	0.70	63%	37%	0.94
▪ 221: Multifamily Housing (Mid-Rise) (TE/DU)	4.54	23%	77%	0.37	61%	39%	0.39
Shoppes II:							
▪ Multifamily Housing (Mid-Rise) (744 Units)	3,378	63	212	275	177	113	290
Park Overflow:							
▪ Multifamily Housing (Mid-Rise) (50 Units)	227	4	15	19	12	8	20
Los Serranos Golf Course:							
▪ Multifamily Housing (Mid-Rise) (532 Units)	2,415	45	152	197	126	81	207
Western Hills Golf Course							
▪ Multifamily Housing (Mid-Rise) (187 Units)	849	16	53	69	45	28	73
Wang:							
▪ Multifamily Housing (Mid-Rise) (148 Units)	672	13	42	55	35	23	58
The Shoppes:							
▪ Multifamily Housing (Mid-Rise) (267 Units)	1,212	23	76	99	63	41	104
The Commons:							
▪ Multifamily Housing (Mid-Rise) (300 Units)	1,362	26	85	111	71	46	117
Canyon Estates:							
▪ Multifamily Housing (Mid-Rise) (163 Units)	740	14	46	60	39	25	64
Wang:							
▪ Multifamily Housing (Mid-Rise) (272 Units)	1,235	23	78	101	65	41	106
Canyon Estates:							
▪ Single Family Detached Housing (166 Units)	1,565	30	86	116	98	58	156
Los Serranos Golf Course:							
▪ Single Family Detached Housing) (41 Units)	387	8	21	29	25	14	39
Total Proposed Projects	**14,042**	**265**	**866**	**1,131**	**756**	**478**	**1,234**

[3] Source: *Trip Generation*, 11th Edition, Institute of Transportation Engineers (ITE), Washington, D.C. (2021).



n:\4400\2214452 – chino hills general plan update vmt analysis, chino hills\6 – dwg\4452 f–1.dwg LDP 18:01:02 05–02–2024 kopulsky

SOURCE: OPEN STREET MAP

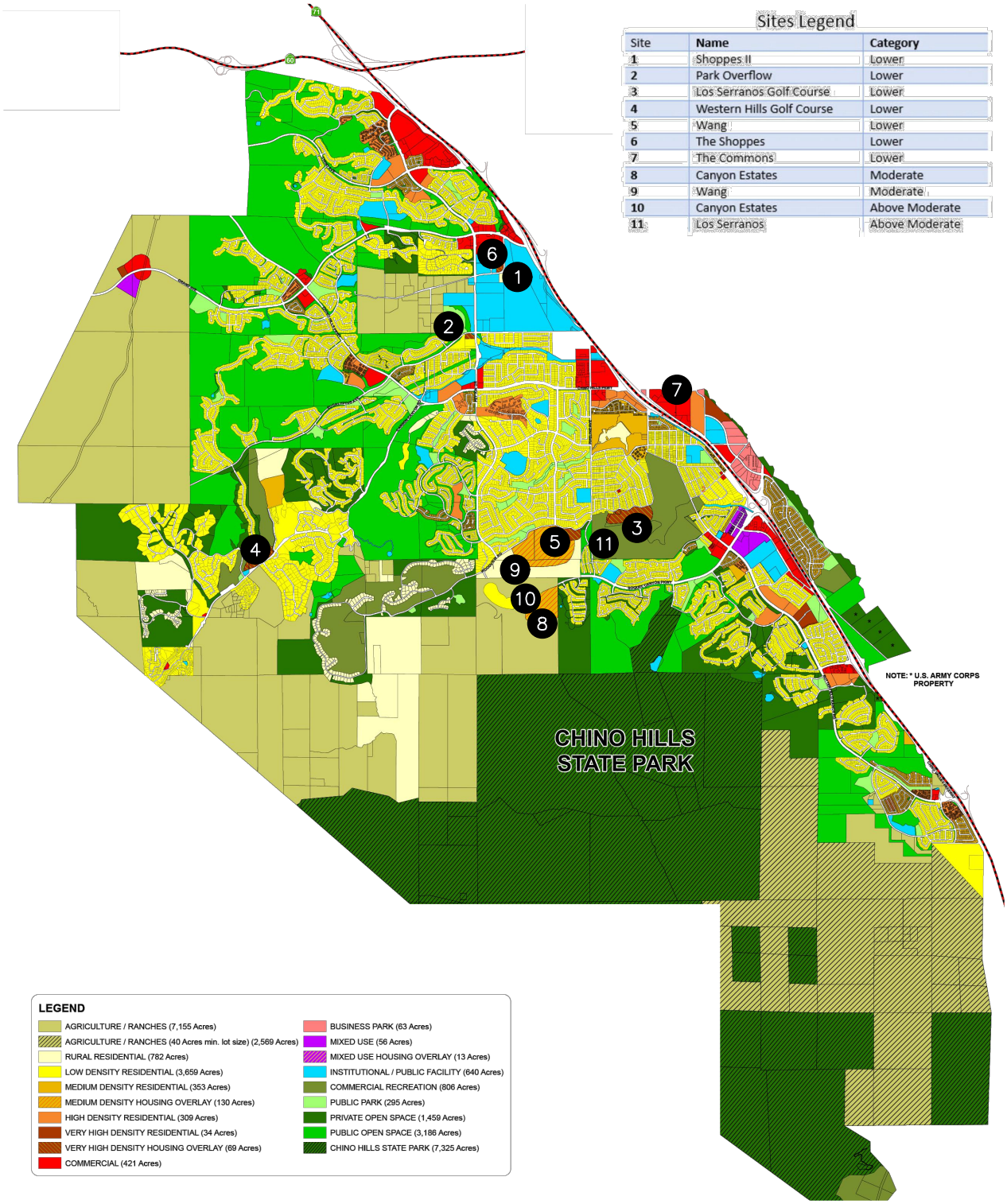
LLG

N NO SCALE

FIGURE 1

VICINITY MAP

CHINO HILLS GENERAL PLAN UPDATE VMT ANALYSIS, CHINO HILLS



n:\4400\2214452 – chino hills general plan update vmt analysis, chino hills\6 – dwg\4452 f–2.dwg LDP 08:15:17 05–03–2024 kopulsky

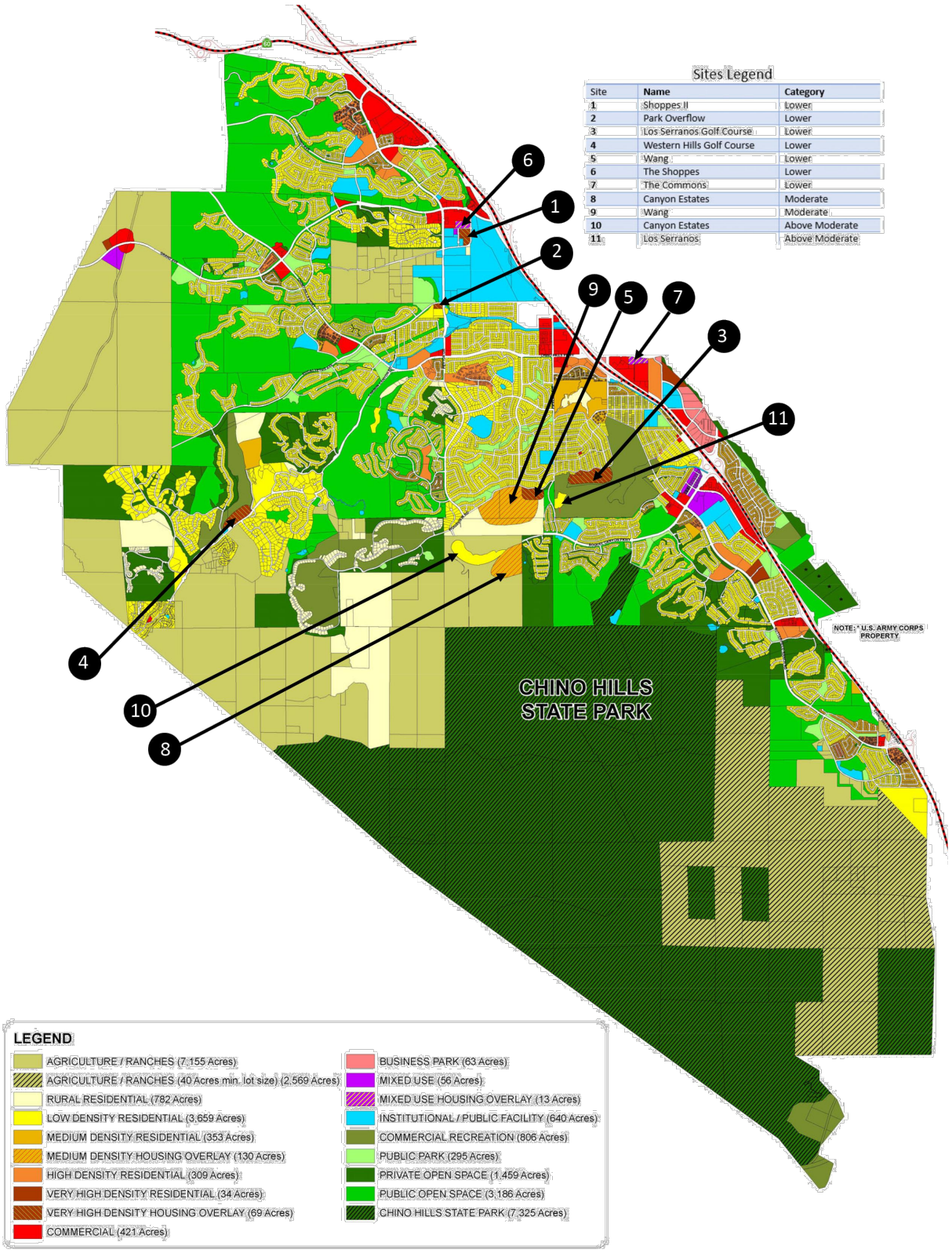
FIGURE 2

LLG

N NO SCALE

CITY OF CHINO HILLS CURRENT GENERAL PLAN LAND USE MAP AND PROPOSED RHNA SITES

CHINO HILLS GENERAL PLAN UPDATE VMT ANALYSIS, CHINO HILLS



n:\4400\2214452 – chino hills general plan update vmt analysis, chino hills\6 – dwg\4452 f-3.dwg LDP 08:36:36 05-03-2024 kopulsky

LLG

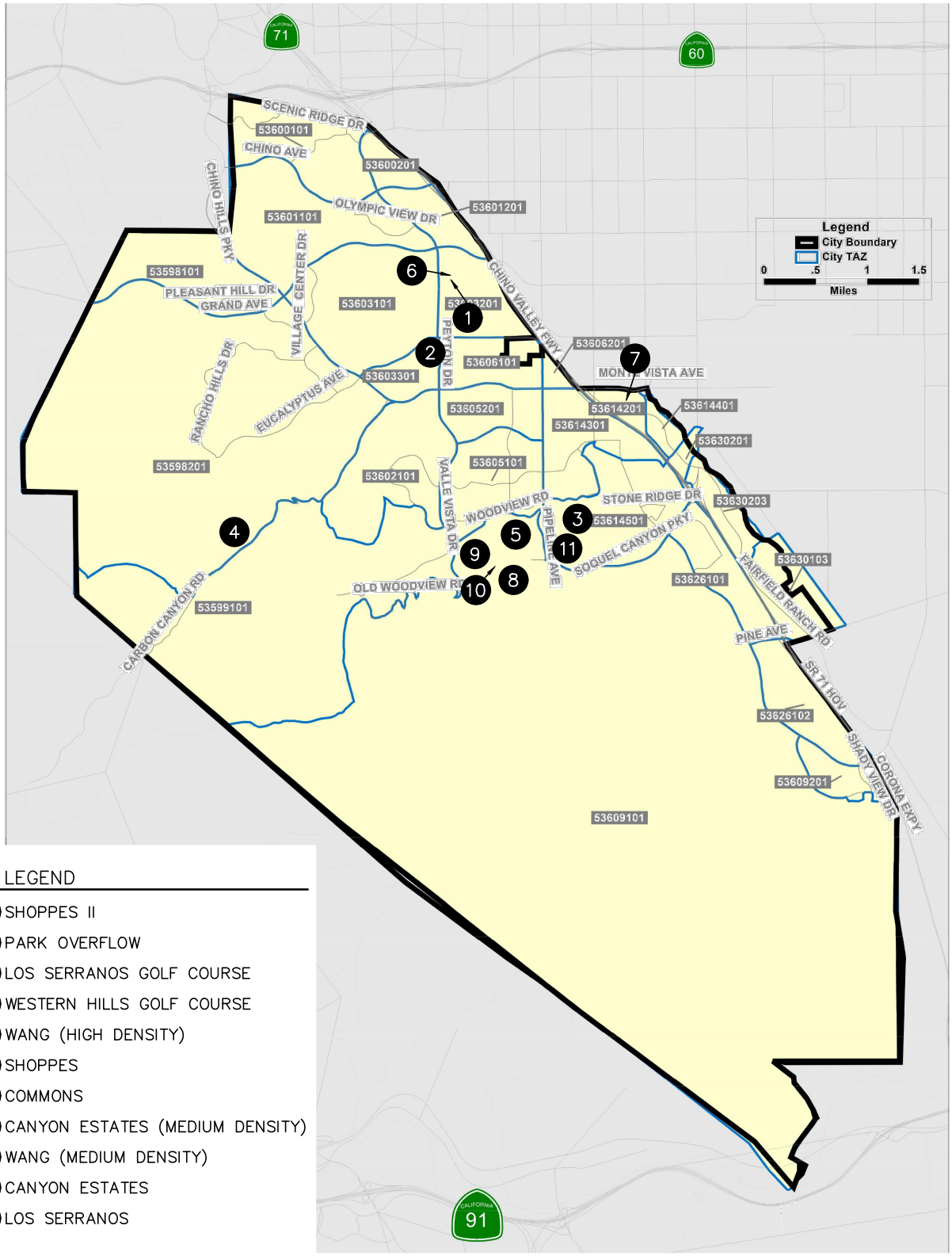
N

NO SCALE

FIGURE 3

PROPOSED CHINO HILLS GENERAL PLAN LAND USE MAP AND PROPOSED RHNA SITES

CHINO HILLS GENERAL PLAN UPDATE VMT ANALYSIS, CHINO HILLS



LEGEND

1. SHOPPES II
2. PARK OVERFLOW
3. LOS SERRANOS GOLF COURSE
4. WESTERN HILLS GOLF COURSE
5. WANG (HIGH DENSITY)
6. SHOPPES
7. COMMONS
8. CANYON ESTATES (MEDIUM DENSITY)
9. WANG (MEDIUM DENSITY)
10. CANYON ESTATES
11. LOS SERRANOS

n:\4400\2214452 - chino hills general plan update vmt analysis, chino hills\6 - dwg\4452 f-4.dwg LDP 08:52:15 05-03-2024 kopulsky

SOURCE: SBTAM

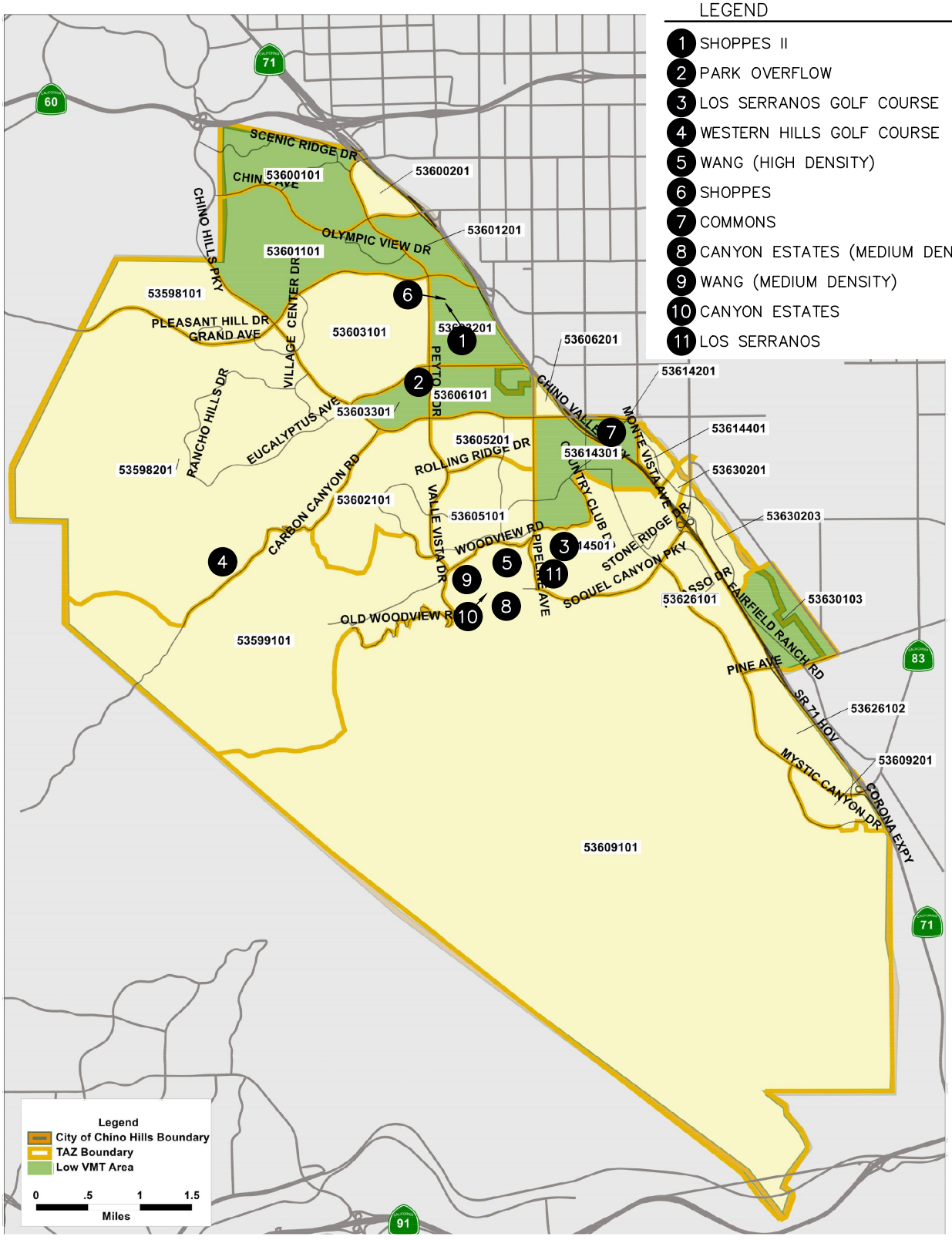
FIGURE 4

LLG

N NO SCALE

TAZ MAP

CHINO HILLS GENERAL PLAN UPDATE VMT ANALYSIS, CHINO HILLS



n:\4400\2214452 – chino hills general plan update vmt analysis, chino hills\6 – dwg\4452 f-5.dwg LDP 09:00:45 05-03-2024 kopulsky

LINSCOTT LAW & GREENSPAN engineers

N NO SCALE

SOURCE: CITY OF CHINO HILLS VMT GUIDELINES IMPLEMENTATION POLICY (ADOPTED ON 4/26/2022)

FIGURE 5

LOW VMT/CAP AREA MAP

CHINO HILLS GENERAL PLAN UPDATE VMT ANALYSIS, CHINO HILLS

THE COMMONS SPECIFIC PLAN AMENDMENT (PROPOSED CHANGES)

The Commons Specific Plan includes changes related to the Housing Element. The amendment will incorporate 300 RHNA units and update various sections to add a mixed use component to the commercial center. Like The Shoppes Specific Plan, The Commons Specific Plan is nearly 20 years old (Exhibit "G"), and cannot be produced in a redline version. Therefore, each of the amended sections are detailed below with changes shown in red.

- Page 1 – 1.1 Specific Plan Purpose

  "The Commons at Chino Hills Specific Plan" (Specific Plan) provides a land use plan, development regulations, and design guidelines for a 49.1-acre freeway-visible ~~commercial~~ mixed-use center. The Specific Plan defines the uses that are permitted and their locations, as well as the sizes and designs of buildings and related improvements on each of the sites. The Specific Plan constitutes the zoning for the project site. This Specific Plan will guide the development of The Commons at Chino Hills in a manner consistent with City and State policies and standards and assures that the project is developed in a coordinated manner.

- Page 2 – 1.3 Specific Plan Objective and 1.4 Project Summary

  The Commons at Chino Hills Specific Plan reflects the City's long term objectives that include expansion of the City's revenue and employment base consistent with maintaining and enhancing a high quality of life for all residents. The following objectives, achieved through implementation of the Specific Plan, have been identified for the project:
  - *Create a mixed-use center with high-quality shopping, dining, commercial, office, hotel, motel, high density housing, and other uses;*
  - *Capture an appropriate share of the demand for upscale retail goods and services in the Chino Valley retail market area;*
  - *Create a visually attractive development through consistent application of architectural and landscape standards/guidelines that will encourage commercial sales;*
  - *Create new office space for firms wanting to locate in Chino Hills in close proximity to retail, restaurant and shopping activities;*
  - *Increase sales tax and property tax revenues to the City; and*
  - *Create local jobs.*

  The 49.1-acre Commons at Chino Hills property is located at the easterly boundary of the City of Chino Hills at the southeast corner of Chino Hills Parkway and Ramona Avenue intersection. The Commons at Chino Hills Specific Plan anticipates development of up to 600,000 square feet of building area for offices,

specialty retail shops, major anchor retailers, restaurants, fast food restaurants, health club, personal and financial services, new vehicle sales, 300 high density housing units , and a hotel or motel. The project also includes up to five (5) freeway pylon signs, plus other project identification signage, and ancillary parking, landscaping and lighting. The permitted uses, development standards, and guidelines of the Specific Plan capitalize on the site's frontages on both the Chino Valley Freeway (SR-71) and Chino Hills Parkway.*

** The designated Mixed Use Housing district permits no more than 300 very high density housing on a maximum of 9 acres within the commercial center to meet Housing Element density requirement of 30-47 du/ac.*

- Page 9 – Table 1-1 General Plan and Zoning Designations

General Plan Designation		Zoning Designation	
Current	After Adoption of Specific Plan	Current	After Adoption of Specific Plan
Commercial	Commercial; Mixed Use Housing	Specific Plan 06-01~~C-F Freeway Commercial~~	Specific Plan 06-01

- Page 10 – Table 1-2 Summary of Permitted Uses

General Commercial Uses / C-F Freeway Commercial Uses	
Prior to Adoption of Specific Plan	After Adoption of Specific Plan'
Service & Repair Facilities as an Accessory Use to a New Vehicle Dealer	Service & Repair Facilities as an Accessory Use to a New Vehicle Dealer
Small Offices	All Office Uses
Hardware & Building Materials Store	Home Improvement, Hardware & Building Materials Store (with Special Activities, Displays, Etc.
Auto & Auto Accessories Dealers	Vehicle/Vessel Sales & Service, New
Appliance Outlets	Appliance Outlets
Restaurants	Restaurants (Sit-Down, Fast Food, Drive-Thru)
Theaters	Theaters & Entertainment
	Alcoholic Beverage Sales (On- and Off-Site)
	Amusement, Arcade, Billiard Parlor
	Athletic Club
	Garden Equipment and Sales
	Specialty Food Store
	Hotel/Motel
	Major Retail Anchor Stores[3]
	Minor Retail Anchor Stores
	Higher Educational Facility
	Mixed Use Housing[2]

** Permits 300 Very High Density housing units in the Mixed Use Housing district on a maximum of 9 acres within the commercial center to meet Housing Element density requirements of 30-47 du/ac.*

- Page 11 – Development Plan and Table 2-1 Typical Tenant Roster

The Commons at Chino Hills Development Plan accommodates a retail commercial development comprised of a minimum of 300,000 square feet and of up to 600,000 square feet of building area. The total area of the Specific Plan is approximately 49.1 acres. The Commons Specific Plan provides for a variety of major promotional retail tenant(s), office buildings (may include medical), complementary specialty retail goods and services, dining venues, and freeway-dependent uses that may include an automobile dealership and hotel or motel. The plan also accommodates the development of up to 300 units of attached high-density housing, on a maximum of nine acres of the site, within a range of 30-47 dwelling units per acre. It is the intent of this Specific Plan that site development is accomplished in a logical and timely manner. Site development standards in the Specific Plan include those relating to the location and sizes of buildings, architectural design guidelines, and a comprehensive landscape plan. These standards were established after consideration of retail market potential, economic viability, environmental sensitivity, and the importance of enhancing the character of the built environment in the City of Chino Hills.

Tenant	Potential Area/Tenant Category
Retail	Up to 600,000 sq. ft
Auto Dealership'	Up to 300,000 sq. ft.
Entertainment	Up to 200,000 sq. ft.
Restaurant	Up to 100,000 sq. ft.
Office[2]	Up to 80,000 sq. ft.
Specialty Food Retail	Up to 40,000 sq. ft.
Non-Professional Services[3]	Up to 15,000 sq. ft.
Fast Food Restaurant, Drive-Thru	Up to 10,000 sq. ft.
Hotel/Motel	Up to 300 Rooms
Mixed Use Housing	Up to 300 units
Total Commercial Building Area	300,000 to 600,000 sq. ft.
Total Very High Density Housing Units	300 units

- Page 31 – Table 3-1 Permitted Uses (Not full extent of list)

Massage Clinics / Day Spas	CUP
Medical/Dental Offices & Surgery Centers	P
Mixed Use Housing/High Density Housing	P[4]
Motorcycle Sales and Service, New	P
Movie Theaters	P

**Refer to Section 3.3.6 for additional provisions for Mixed Use Housing Development*

- Page 33 – *3.3.6 Mixed Use Housing Development (new section)*

The Commons Specific Plan accommodates the development of up to 300 residential dwelling units on no more than nine acres of land area within the Specific Plan. The units may be built on one site or several sites within the Specific Plan provided the site or sites combined do not exceed nine acres in total. Residential buildings may incorporate commercial uses ("vertical mixed use" format) or can be built separately from commercial ("horizontal mixed use" format). The Specific Plan does not illustrate the potential locations for residential development in the Conceptual Site Plan. As such, any proposed residential development within the Specific Plan shall use the following principals to guide such development:

A. Multifamily residential buildings that are built on vacant pad sites or within existing parking areas shall be located in a manner to easily integrate with existing drive aisles, project entries, and commercial buildings, creating a cohesive design for the center.

B. Pedestrian pathways, including shade components such as trees, trellises, or arcades, shall connect residential buildings to commercial areas in an integrated way.

C. Residential buildings should be located away from State Route 71 in order to avoid the air quality and noise impacts of the freeway.

D. Residential buildings shall have clearly delineated drive aisles and entries to distinguish them from commercial areas.

E. Residential buildings shall comply with the requirements of Chapter 16.05 – Objective Design Standards of the Chino Hills Development Code.

- Page 33-34 – 3.4 Development Standards and Table 3-2

Minimum site development standards for commercial buildings are those of the "C-F, Freeway Commercial District" set forth in Section 16.12 of the City of Chino Hills Development Code except as otherwise indicated herein. Minimum site development standards for residential or mixed-use buildings are those of the "Mixed Use Housing Zone" as set forth in Section 16.15 of the Development Code. Table 3-2 sets forth the site development standards for The Commons at Chino

Hills. Parking for Mixed Use Housing shall refer to Chapter 16.15 Housing Priority Districts for required parking.

Development Standard	MinimumlMaximum Required
A.Minimum Lot Size	2,500 Square Feet
B. Minimum Lot Dimensions Width Depth	 50' feet
C. Maximum Height	
Major Retail'	50' feet to roofline; 60' feet to top of architectural feature
Minor Retail[2]	25' feet to roofline; 35' feet to top of architectural feature
Office	80' feet to roofline; 90' feet to top of architectural feature
Hotel	SO' feet to roofline; 90' feet to top of architectural feature
Mixed Use Housing	80' feet

- Page 38 – 3.4.9 Architecture and Design

  Additional details on the design and architecture of The Commons at Chino Hills can be found in Section 4, Design Guidelines, and Chapter 16.05 Objective Design Standards for Mixed Use Housing.

Exhibit "G"

The Commons at Chino Hills
Specific Plan

Chino Hills, CA

CITY COUNCIL
APPROVED BY:
CITY OF CHINO HILLS
PLANNING COMMISSION
Signed
Date 9/12/06

THE COMMONS AT CHINO HILLS

Prepared for:
City of Chino Hills
2001 Grand Avenue
Chino Hills, CA 91709

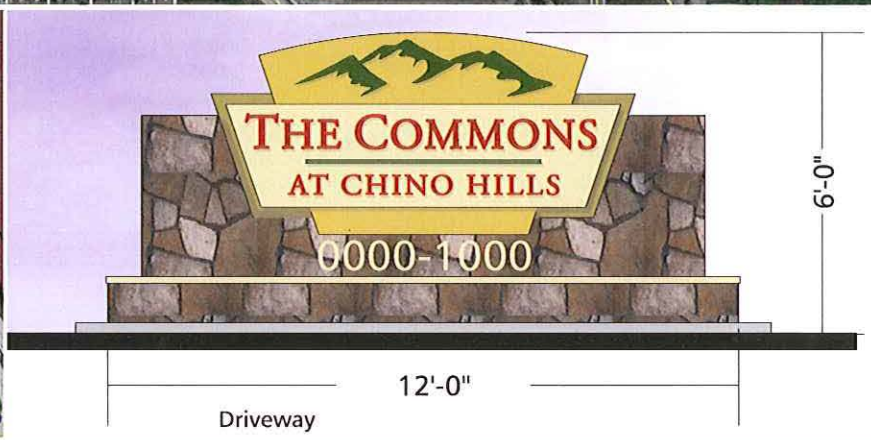
Prepared by:
Hogle-Ireland, Inc.
2860 Michelle Drive, Suite 100
Irvine, CA 92606

September 12, 2006

Submitted by:
Opus West Corporation
2020 Main Street, Suite 800
Irvine, CA 92614







The Commons at Chino Hills Specific Plan

(Adopted – September 12, 2006)

Lead Agency:
City of Chino Hills
Community Development Department
2001 Grand Avenue
Chino Hills, CA 91709
909.364.2742
Contact: Zai Abu Bakar, Assistant Community Development Director

Project Sponsor:
Opus West Corporation
2020 Main Street, Suite 800
Irvine, CA 92614
949.622.1950
Contact: Jeff Hill, Vice President Real Estate

Prepared by:
Hogle-Ireland, Inc.
2860 Michelle Drive, Ste. 100
Irvine, CA 92606
949.553.1427
Contact: Alexa Wyneken, Senior Associate Project Manager

TABLE OF CONTENTS

1. INTRODUCTION 1

1.1 SPECIFIC PLAN PURPOSE 1
1.2 AUTHORITY FOR THE SPECIFIC PLAN 1
1.3 SPECIFIC PLAN OBJECTIVES 2
1.4 PROJECT SUMMARY 2
1.5 PROJECT SETTING 3
1.5.1 PROJECT LOCATION 3
1.5.2 ON-SITE LAND USES 3
1.5.3 SURROUNDING LAND USES 3
1.5.4 GENERAL PLAN AND ZONING DESIGNATIONS 9

2. DEVELOPMENT PLAN 11

2.1 LAND USE PLAN 11
2.2 CONCEPTUAL SITE PLAN 11
2.3 CIRCULATION PLAN 15
2.3.1 VEHICULAR CIRCULATION AND ACCESS 15
2.4 INFRASTRUCTURE PLAN 21
2.4.1 WATER 21
2.4.2 DRAINAGE 21
2.4.3 SEWER 21
2.4.4 GRADING 21
2.4.5 ELECTRICITY 21
2.4.6 NATURAL GAS 21
2.4.7 TELEPHONE, INTERNET AND CABLE 21
2.4.8 SOLID WASTE DISPOSAL 22
2.5 PUBLIC FACILITIES AND SERVICES 22
2.5.1 PUBLIC SAFETY 22
2.5.2 PUBLIC TRANSPORTATION 22

3. DEVELOPMENT STANDARDS 27

3.1 PURPOSE 27
3.1.1 REFERENCES 27
3.1.2 RESOLUTION OF ISSUES 27
3.2 CONCEPTUAL SITE PLAN 27
3.3 PERMITTED USES 28
3.3.1 PROMOTIONAL DISPLAYS AND ACTIVITIES 31
3.3.2 ENTERTAINMENT USES 32
3.3.3 HIGHER EDUCATIONAL USES 32
3.3.4 OUTDOOR ACCESSORY USES AND EVENTS 32
3.3.5 CELL PHONE ANTENNA SITES 33
3.4 DEVELOPMENT STANDARDS 33
3.4.1 PROJECTIONS INTO BUILDING SETBACKS 34
3.4.2 CLEAR AREA 35
3.4.3 TEMPORARY STRUCTURES AND USES 35
3.4.4 TRASH ENCLOSURES / REFUSE BINS 36
3.4.5 WALLS AND FENCES 36
3.4.6 PARKING AND LOADING 36
3.4.7 TRIP REDUCTION PROGRAM 37
3.4.8 SIGNS 37
3.4.9 ARCHITECTURE AND DESIGN 38

4. DESIGN GUIDELINES 45

4.1 PURPOSE AND INTENT 45
4.2 DESIGN THEME 45
4.3 BUILDING FORM & MASS 46
4.4 DETAILS & MATERIALS 46
4.5 OUTSIDE FURNISHING 47
4.6 ENTRYWAYS 47
4.7 OUTDOOR LIGHTING 47
4.8 PAVING 48
4.9 SIGN PROGRAM 53
4.9.1 MEDIA PROGRAM 53
4.9.2 WAYFINDING SIGNS 53
4.9.3 PYLON / READER BOARD 53
4.9.4 MAJOR SITE IDENTITY MONUMENTS 53
4.9.5 TENANT MONUMENT SIGNS 54
4.9.6 VEHICULAR SCALED DIRECTIONAL SIGNS 54
4.9.7 PEDESTRIAN SCALED DIRECTIONAL SIGNS 54
4.9.8 PROJECT DIRECTORY SIGNS AND COMMUNITY BOARD 54
4.9.9 SITE PAGEANTRY 54
4.9.10 REGULATORY SIGNAGE 54
4.9.11 TENANT IDENTITY SIGNAGE 55
4.9.12 TEMPORARY SIGNS 55
4.9.13 PROHIBITED SIGNAGE 56
4.10 LANDSCAPE GUIDELINES 79
4.10.1 INTRODUCTION 79
4.10.2 STREET TREES 80

5. IMPLEMENTATION PLAN 83

5.1 PHASING 83
5.2 FINANCING AND FEES 83
5.2.1 APPLICABILITY 83
5.2.2 ADMINISTRATION 83
5.2.3 INTERPRETATION 83
5.2.4 IMPLEMENTATION 84
5.2.5 SPECIFIC PLAN REVISIONS 84
5.2.6 MINOR MODIFICATIONS 84
5.2.7 APPEALS 85
5.2.8 DEVELOPMENT PERMITS 85
5.2.9 MAPS 85
5.3 GENERAL PLAN CONSISTENCY 85

LIST OF EXHIBITS

EXHIBIT 1.1: REGIONAL / VICINITY MAP 5
EXHIBIT 1.2: AERIAL PHOTOGRAPH 7
EXHIBIT 2.1: CONCEPTUAL SITE PLAN 13
EXHIBIT 2.2: CONCEPTUAL STREET IMPROVEMENT PLAN 17
EXHIBIT 2.3: CONCEPTUAL STREET SECTIONS 19
EXHIBIT 2.4: CONCEPTUAL WATER &SEWER PLAN 23
EXHIBIT 2.5: CONCEPTUAL GRADING & DRAINAGE PLAN 25
EXHIBIT 3.1: CONCEPTUAL SITE PLAN 39
EXHIBIT 3.2: CONCEPTUAL ELEVATIONS 41
EXHIBIT 3.3: CELL PHONE TOWER EXAMPLES 43
EXHIBIT 4.1: BUILDING DESIGN EXAMPLES 49
EXHIBIT 4.2: EXAMPLES OF CORNER & ENTRY FEATURES 51
EXHIBIT 4.3: CONCEPTUAL SIGN LOCATIONS 57
EXHIBIT 4.4: FREEWAY PYLON/READER BOARD SIGN CONCEPT 59
EXHIBIT 4.5: FREEWAY PYLON SIGN CONCEPT 61
EXHIBIT 4.6: MAJOR SITE IDENTITY MONUMENTS 63
EXHIBIT 4.7: CONCEPTUAL MONUMENT SIGNS 65
EXHIBIT 4.8: DIRECTIONAL SIGNS 67
EXHIBIT 4.9: PROJECT DIRECTORY SIGNS & COMMUNITY BOARDS 69
EXHIBIT 4.10: SITE PAGEANTRY 71
EXHIBIT 4.11: REGULATORY SIGNAGE 73
EXHIBIT 4.12: TENANT IDENTITY SIGNAGE 75
EXHIBIT 4.13: TENANT IDENTITY SIGNAGE 77
EXHIBIT 4.14: CONCEPTUAL LANDSCAPE PLAN 81

LIST OF TABLES

TABLE 1-1: GENERAL PLAN AND ZONING DESIGNATIONS 9
TABLE 1-2: SUMMARY OF PERMITTED USES 10
TABLE 2-1: TYPICAL TENANT ROSTER 11
TABLE 3-1: PERMITTED USES 28
TABLE 3-2: DEVELOPMENT STANDARDS 33
TABLE 3-3: PROJECTIONS INTO BUILDING SETBACKS 34

1. INTRODUCTION

1.1 SPECIFIC PLAN PURPOSE

"The Commons at Chino Hills Specific Plan" (Specific Plan) provides a land use plan, development regulations, and design guidelines for a 49.1-acre freeway-visible commercial center. The Specific Plan defines the uses that are permitted and their locations, as well as the sizes and designs of buildings and related improvements on each of the sites. The Specific Plan constitutes the zoning for the project site. This Specific Plan will guide the development of The Commons at Chino Hills in a manner consistent with City and State policies and standards and assures that the project is developed in a coordinated manner.

Tentative and final parcel map(s) or Development Plans (Site Plans, etc.) may be prepared and submitted to the City pursuant to the applicable provisions of the State of California Subdivision Map Act (Government Code Sections 66410 through 66499), the City of Chino Hills Subdivision Ordinance, the City of Chino Hills Development Code and consistent with the applicable provisions contained within The Commons at Chino Hills Specific Plan. The Development Plans will be submitted for City review prior to development of the project site.

The purpose of the Specific Plan is:

- To implement the goals and policies of the General Plan of the City of Chino Hills through more detailed, site-specific standards that provide direction for development;
- To establish a new zoning designation for the planning area that recognizes its unique place in the Chino Hills community;
- To establish development standards and design principles for the planning area; and
- To serve as a guideline for the amenities provided and the quality of development within the Specific Plan area.

1.2 AUTHORITY FOR THE SPECIFIC PLAN

Section 65450 et seq. of the Government Code sets forth basic requirements and provisions for specific plans. The Government Code specifically states:

> *"After the legislative body has adopted a general plan, the planning agency may, or if so directed by the legislative body, shall prepare specific plans for the systematic implementation of the general plan for all or part of the area covered by the general plan."*

Section 65451 of the Government Code requires that specific plans include text and a diagram or diagrams that specify all of the following:

- The distribution, location and the extent of the uses of land, including open space within the area covered by the plan;

- The proposed distribution, location, and extent and intensity of major components of public and private transportation, sewage, water, drainage, solid waste disposal, energy, and other essential facilities proposed to be located within the area covered by the plan and needed to support the land uses described in the plan;
- Standards and criteria by which development will proceed, and standards for the conservation, development, and utilization of natural resources, where applicable;
- A program of implementation measures including regulations, programs, public works projects, and financing measures necessary to carry out the project;
- A statement of the relationship of the specific plan to the general plan.

The Commons at Chino Hills Specific Plan is designed to meet the requirements of the State of California Government Code and the City of Chino Hills General Plan. The Commons at Chino Hills Specific Plan is adopted by ordinance and thereby establishes the zoning regulations for the development of the project site.

1.3 SPECIFIC PLAN OBJECTIVES

The Commons at Chino Hills Specific Plan reflects the City's long term objectives that include expansion of the City's revenue and employment base consistent with maintaining and enhancing a high quality of life for all residents. The following objectives, achieved through implementation of the Specific Plan, have been identified for the project:

- Create a mixed-use center with high-quality shopping, dining, commercial, office, hotel, motel, and other uses;
- Capture an appropriate share of the demand for upscale retail goods and services in the Chino Valley retail market area;
- Create a visually attractive development through consistent application of architectural and landscape standards/guidelines that will encourage commercial sales;
- Create new office space for firms wanting to locate in Chino Hills in close proximity to retail, restaurant and shopping activities;
- Increase sales tax and property tax revenues to the City; and
- Create local jobs.

1.4 PROJECT SUMMARY

The 49.1-acre Commons at Chino Hills property is located at the easterly boundary of the City of Chino Hills at the southeast corner of Chino Hills Parkway and Ramona Avenue intersection. The Commons at Chino Hills Specific Plan anticipates development of up to 600,000 square feet of building area for offices, specialty retail shops, major anchor retailers, restaurants, fast food restaurants, health club, personal and financial services, new vehicle sales, and a hotel or motel. The project also includes up to five (5) freeway pylon signs, plus other project identification signage, and ancillary parking, landscaping and lighting. The permitted uses, development standards, and guidelines of the Specific Plan capitalize on the site's frontages on both the Chino Valley Freeway (SR-71) and Chino Hills Parkway.

The proposed uses for The Commons at Chino Hills will be a positive contribution to the City of Chino Hills through the establishment of a strong design theme that creates a unique project identity and builds community character.

1.5 PROJECT SETTING

1.5.1 Project Location

The City of Chino Hills is located in southwestern San Bernardino County, and is uniquely situated adjacent to the boundaries of Los Angeles, Orange, and Riverside Counties. Exhibit 1.1, Regional/Vicinity Map, provides the location of the Specific Plan area in its regional context.

The Commons at Chino Hills Specific Plan project area is bound by the Chino Valley Freeway (SR-71) on the south and west side, Ramona Avenue to the west, and Chino Hills Parkway to the north. Primary local access to the project site is provided from Chino Hills Parkway. Exhibit 1.2, Aerial Photograph, provides an aerial photograph depicting the existing conditions of the project site.

1.5.2 On-Site Land Uses

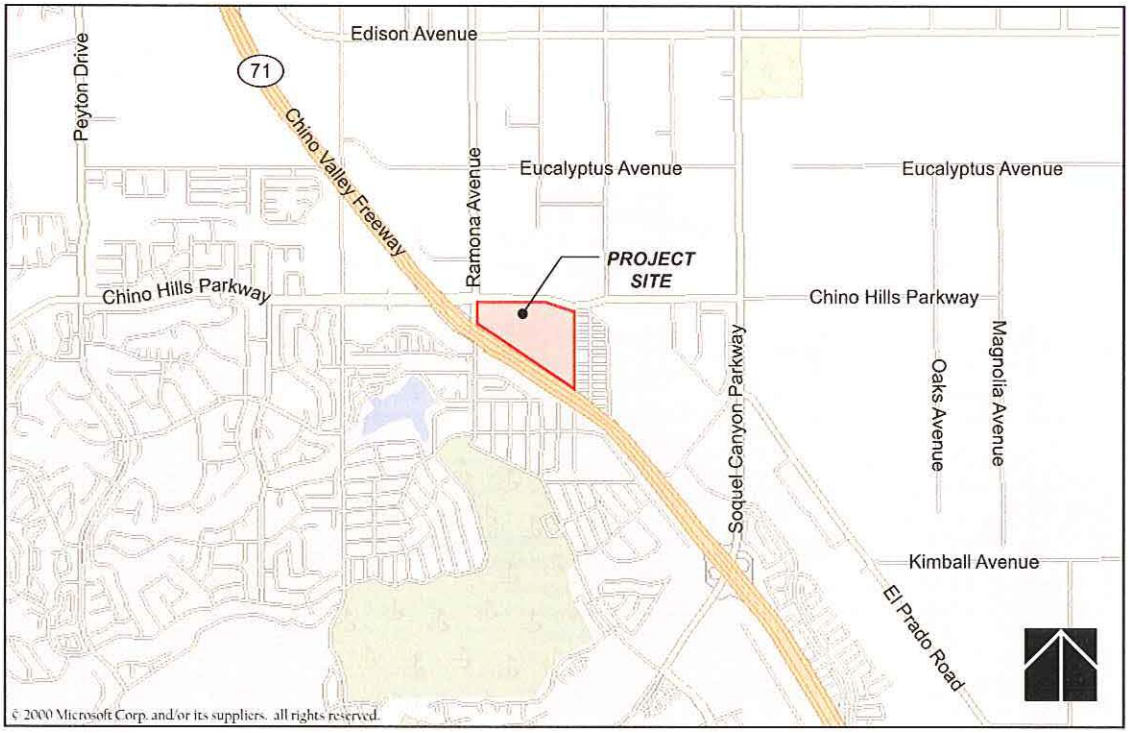
Prior to adoption of the Specific Plan, the on-site land uses consisted of agricultural uses, primarily for planting of row crops, most currently wheat. Small ancillary shed structures were located on the northwestern portion of the site and used for miscellaneous storage of farming supplies. Two water wells existed on the western portion of the site, one of which was housed in a corrugated metal shed, and both of which were used to irrigate the agricultural operations on the property prior to development of The Commons. A small fenced enclosure for storing farm equipment was present on the western portion of the site.

1.5.3 Surrounding Land Uses

Uses surrounding The Commons at Chino Hills Specific Plan site include: the Monte Vista Mobile Home Park to the east; vacant land to the west across Ramona Avenue; Chino Valley Freeway (SR-71) to the south and west; an auto dealership, industrial buildings, a business park and office buildings to the northwest across Chino Hills Parkway; and, dairy land planned to be a retail shopping center to the north across Chino Hills Parkway (City of Chino).



Regional Context Map



Vicinity Map

Regional/Vicinity Map 1.1



Aerial Photograph 1.2

1.5.4 General Plan and Zoning Designations

Prior to adoption of the Specific Plan, The Commons at Chino Hills site was designated as "General Commercial" on the General Plan Land Use Map and as "C-F, Freeway Commercial" on the Zoning Map. The General Commercial designation allows uses that include service and repair facilities, small offices, hardware and building materials stores, auto and auto accessories dealers, appliance outlets, theaters, etc. Office uses are also permitted in areas designated for General Commercial.

Adoption of The Commons at Chino Hills Specific Plan effectively changes the zoning of the property from "Freeway Commercial" to "Specific Plan (SP) 06-01." The Commons at Chino Hills Specific Plan provides for uses that are oriented toward the regional needs of the market and/or serving the needs of those who travel the Chino Valley Freeway (SR-71). Permitted land uses will benefit from both freeway visibility and access in maximizing their retail sales tax generation potential. With adoption of this Specific Plan, the project site's zoning will be changed to Specific Plan (SP) 06-01. Development Standards are contained in Section 3 of this Specific Plan document, which provide detailed zoning standards specifically tailored for The Commons at Chino Hills Specific Plan.

Table 1-1 summarizes the General Plan and Zoning Designation for the project site prior to and subsequent to adoption of the Specific Plan. Table 1-2 summarizes the permitted uses for the project site prior to and after adoption of the Specific Plan.

TABLE 1-1: GENERAL PLAN AND ZONING DESIGNATIONS

General Plan Designation		Zoning Designation	
Prior to Adoption of Specific Plan	After Adoption of Specific Plan	Prior to Adoption of Specific Plan	After Adoption of Specific Plan
Commercial	Commercial	C-F Freeway Commercial	Specific Plan 06-01

TABLE 1-2: SUMMARY OF PERMITTED USES

General Commercial Uses / C-F Freeway Commercial Uses	
Prior to Adoption of Specific Plan	**After Adoption of Specific Plan[1]**
Service & Repair Facilities as an Accessory Use to a New Vehicle Dealer	Service & Repair Facilities as an Accessory Use to a New Vehicle Dealer
Small Offices	All Office Uses
Hardware & Building Materials Store	Home Improvement, Hardware & Building Materials Store (with Special Activities, Displays, Etc.[2])
Auto & Auto Accessories Dealers	Vehicle/Vessel Sales & Service, New
Appliance Outlets	Appliance Outlets
Restaurants	Restaurants (Sit-Down, Fast Food, Drive-Thru)
Theaters	Theaters & Entertainment
	Alcoholic Beverage Sales (On- and Off-Site)
	Amusement, Arcade, Billiard Parlor
	Athletic Club
	Garden Equipment and Sales
	Specialty Food Store
	Hotel/Motel
	Major Retail Anchor Stores[3]
	Minor Retail Anchor Stores
	Higher Educational Facility[4]

[1] Detailed permitted uses are provided in Table 3-1, Permitted Uses, on page 30.
[2] Includes promotional items or events.
[3] A major retail store is a minimum 10,000 square feet and above.
[4] Refer to Section 3.3.3 for additional provision to Higher Educational Facilities

2. DEVELOPMENT PLAN

2.1 LAND USE PLAN

The Commons at Chino Hills Development Plan accommodates a retail commercial development comprised of a minimum of 300,000 square feet and of up to 600,000 square feet of building area. The total area of the Specific Plan is approximately 49.1 acres. The Commons Specific Plan provides for a variety of major promotional retail tenant(s), office buildings (may include medical), complementary specialty retail goods and services, dining venues, and freeway-dependent uses that may include an automobile dealership and hotel or motel. It is the intent of this Specific Plan that site development is accomplished in a logical and timely manner. Site development standards in the Specific Plan include those relating to the location and sizes of buildings, architectural design guidelines, and a comprehensive landscape plan. These standards were established after consideration of retail market potential, economic viability, environmental sensitivity, and the importance of enhancing the character of the built environment in the City of Chino Hills.

2.2 CONCEPTUAL SITE PLAN

The Conceptual Site Plan for The Commons at Chino Hills is illustrated in Exhibit 2.1. Review and approval of actual development plans will occur as implementing actions of this Specific Plan. Section 5, "Implementation Plan", sets forth submittal and review requirements for implementing The Commons at Chino Hills Specific Plan.

A typical tenant roster at build-out consistent with the Conceptual Site Plan is summarized in Table 2-1.

TABLE 2-1: TYPICAL TENANT ROSTER

Tenant	Potential Area/Tenant Category
Retail	Up to 600,000 sq. ft
Auto Dealership[1]	Up to 300,000 sq. ft.
Entertainment	Up to 200,000 sq. ft.
Restaurant	Up to 100,000 sq. ft.
Office[2]	Up to 80,000 sq. ft.
Specialty Food Retail	Up to 40,000 sq. ft.
Non-Professional Services[3]	Up to 15,000 sq. ft.
Fast Food Restaurant, Drive-Thru	Up to 10,000 sq. ft.
Hotel/Motel	Up to 300 Rooms
Total Building Area	**300,000 to 600,000 sq. ft.**

[1] Square footage of showroom, offices and service facilities.
[2] Three (3) banks shall be permitted on-site.
[3] May include hair salons, day spas, nail salons, and similar uses.

[This page intentionally left blank]



Not to scale
Source: KKE Architects

Conceptual Site Plan 2.1

THE COMMONS AT
CHINO HILLS SPECIFIC PLAN

2.3 CIRCULATION PLAN

2.3.1 Vehicular Circulation and Access

Roadways existing before implementation of the Specific Plan include Chino Hills Parkway serving as the northerly boundary of the project site and Ramona Avenue serving as the westerly boundary of the site. The Conceptual Circulation Plan consists of the existing roadway network, which is consistent with the City of Chino Hills General Plan Circulation Element. Direct access to The Commons at Chino Hills is provided via Chino Hills Parkway.

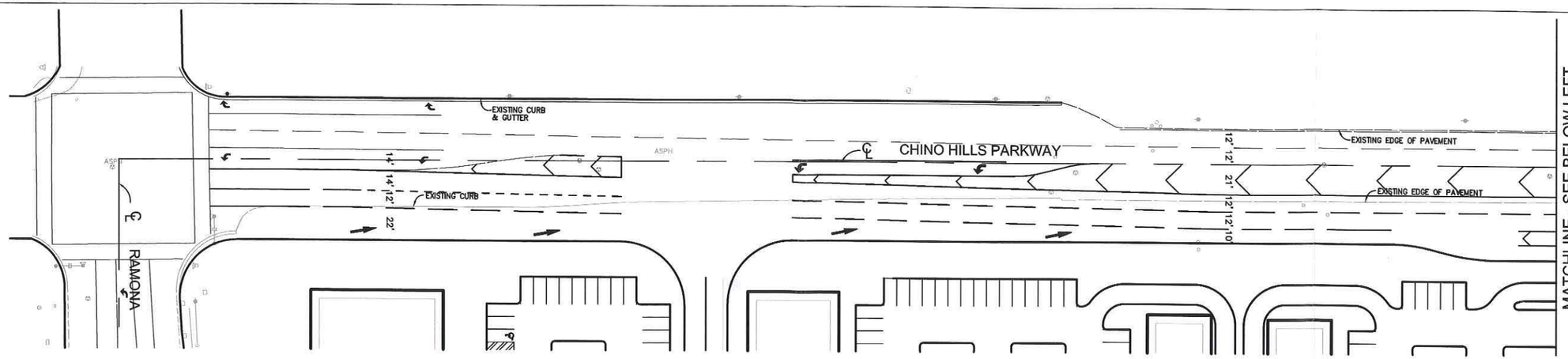
Chino Hills Parkway – Public, Major Arterial

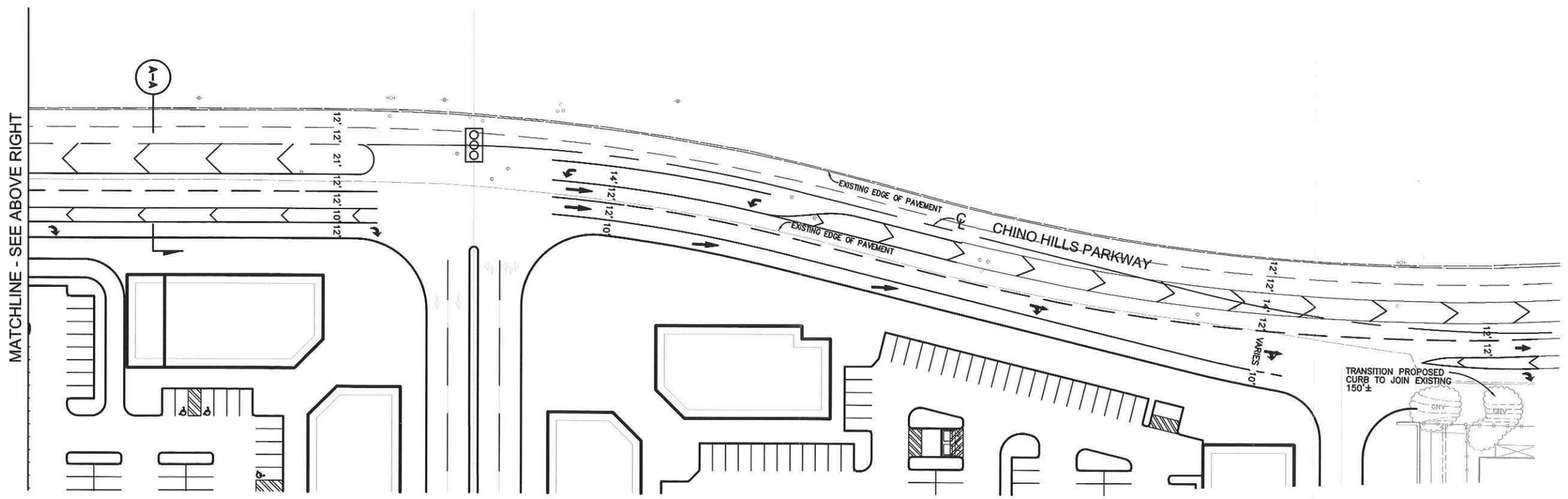
Defined as a Major Arterial in the City of Chino Hills General Plan Circulation Element, Chino Hills Parkway was a four-lane, divided east-west roadway prior to implementation of the Specific Plan. Improvements in conjunction with development consistent with the Specific Plan include construction of Chino Hills Parkway from Ramona Avenue to the east project boundary at its ultimate half-section width including landscaping and parkway improvements. The conceptual street improvement plan for Chino Hills Parkway is shown in Exhibit 2.2. The street sections for Chino Hills Parkway are illustrated in Exhibit 2.3.

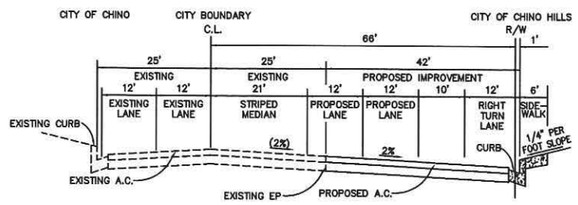
Vehicular access to The Commons is provided from Chino Hills Parkway via a full-signalized main entrance and two right-in/right-out driveways. The traffic signal is included among off-site improvements constructed in conjunction with development of The Commons at Chino Hills. The main entrance includes two inbound and two outbound travel lanes. Each right-in/right-out driveway is comprised of one inbound and one outbound lane.

Ramona Avenue – Public, Collector

Defined as a Collector in the City of Chino Hills Circulation Element, Ramona Avenue is a public, north-south, four-lane divided roadway north of SR-71 and a two-lane undivided roadway south of SR-71. Ramona Avenue does not provide direct access to the project but supplies a connection to Chino Hills Parkway up to the Chino Valley Freeway (SR-71).



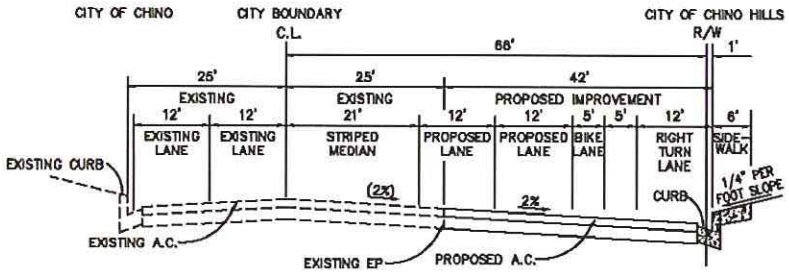




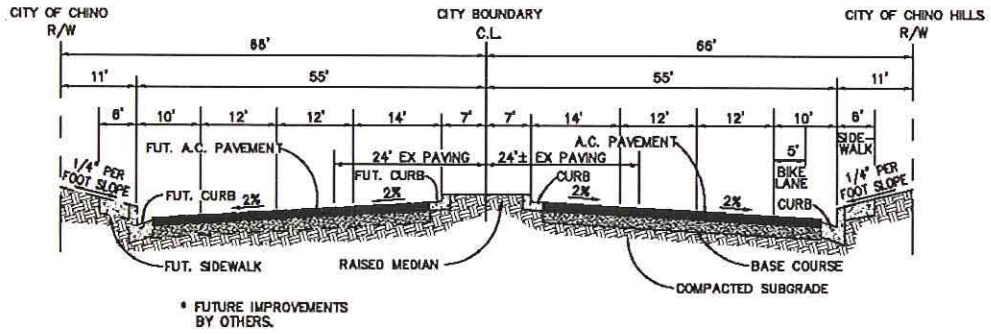
CHINO HILLS PKWY (INTERIM)
WITH STRIPED MEDIAN
N.T.S

Conceptual Street Improvement Plan 2.2

Not to scale
Source: Canyon Consulting



CHINO HILLS PKWY (INTERIM)
WITH STRIPED MEDIAN
N.T.S



CHINO HILLS PKWY (ULTIMATE)
WITH RAISED MEDIAN
N.T.S

Conceptual Street Sections 2.3

Not to scale
Source: Canyon Consulting

2.4 INFRASTRUCTURE PLAN

2.4.1 Water

Potable water for the project is provided by the City of Chino Hills. The Specific Plan site is served by an existing ten inch (10") diameter pipe extending east-west within an easement through the southerly portion of the site and an existing pipe extending north-south through the central portion of the site. These pipes and the on-site water distribution lines are shown in the "Conceptual Water and Sewer Plan" in Exhibit 2.4. Recycled water lines are included within the project site for connection.

2.4.2 Drainage

Stormwater run-off from The Commons site will be collected in a series of catch basins located throughout the parking lot and drive aisles. The catch basins are connected via underground storm drains which converge in a single storm drain pipe extending from the southeasterly corner of the site to the Lake Los Serranos Channel (an improved channel) located approximately 1,600 feet southeast of the site. On-site water retention is not needed. Water flow is treated to comply with the County of San Bernardino's Water Quality Management Permit. Water flow is either treated on-site by man-made clarifiers or other filters. Storm drain lines within The Commons project site shall be owned and maintained by The Commons development. Exhibit 2.5 shows the "Conceptual Grading and Drainage Plan."

2.4.3 Sewer

Sewage generated on-site is collected and flows through a series of sanitary sewer pipes and manholes before being discharged into an eighteen inch (18") sanitary sewer main owned and operated by the City of Chino Hills. The sewer main is located within an easement that crosses the southern portion of the Specific Plan site in an east-west direction. Exhibit 2.4 shows the "Conceptual Water and Sewer Plan."

2.4.4 Grading

The Rough Grading Plan for The Commons at Chino Hills Specific Plan includes the 49.1 acre site and is included in Exhibit 2.5.

2.4.5 Electricity

Southern California Edison provides electricity to the Specific Plan site. All electrical lines shall be provided and designed as required within the Conditions of Approval

2.4.6 Natural Gas

The Southern California Gas Company supplies natural gas to the Specific Plan area. A high-pressure gas line crosses the Specific Plan site in a utility easement that crosses the southerly portion of the site in an east-west direction. Connection to a six inch (6") gas lines occurs in Ramona Avenue.

2.4.7 Telephone, Internet and Cable

Telephone, Internet, and cable television infrastructure and service connections are available at the Specific Plan site.

2.4.8 Solid Waste Disposal

Solid waste collection and disposal is provided through Chino Hills Disposal, the exclusive solid waste and recycling service provider for the City. The project is required to comply with applicable State and local regulations.

2.5 PUBLIC FACILITIES AND SERVICES

2.5.1 Public Safety

2.5.1.1 LAW ENFORCEMENT

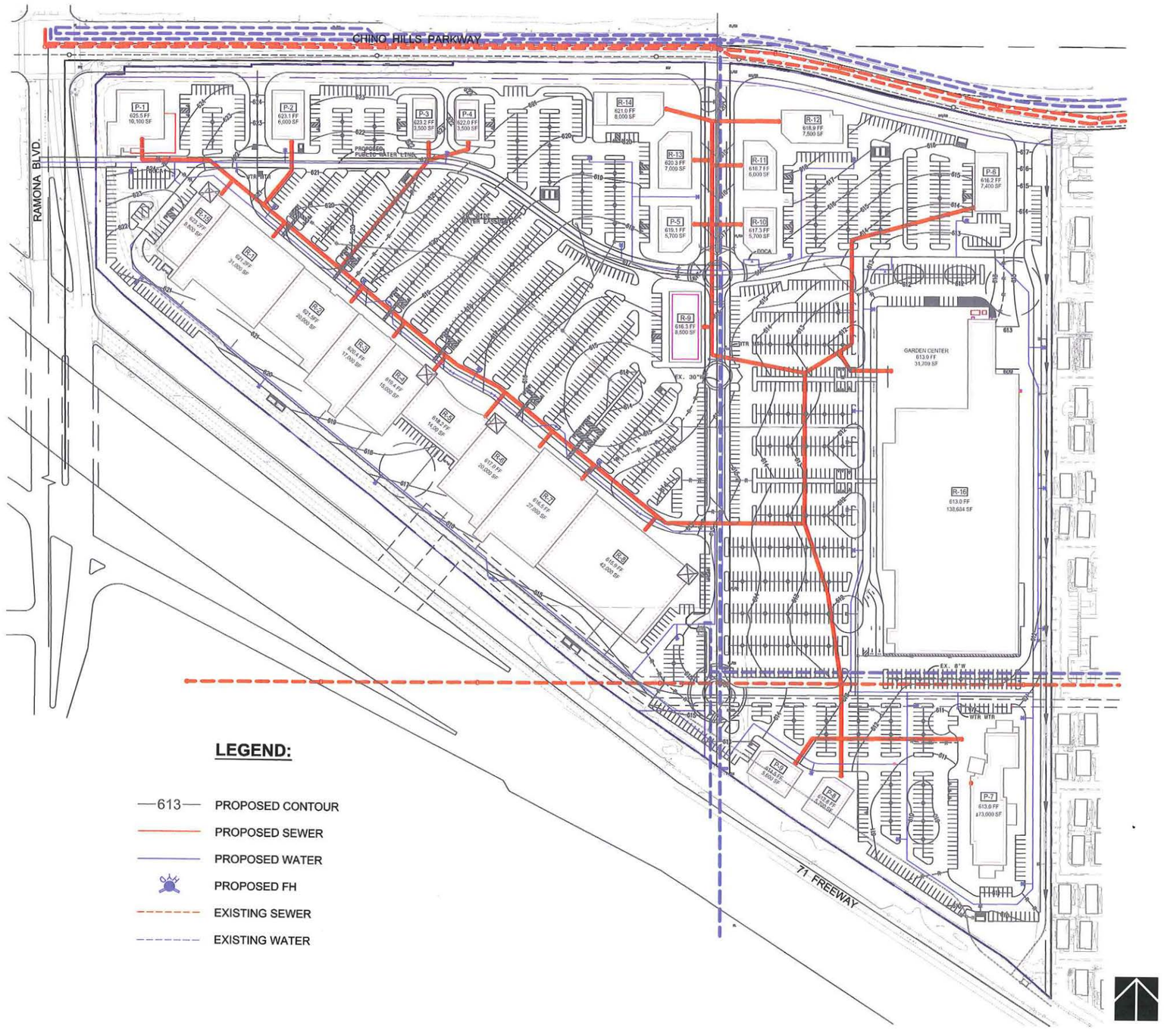
Law enforcement for the Specific Plan area is provided to the City of Chino Hills by contract with the San Bernardino County Sheriff's Department.

2.5.1.2 FIRE PROTECTION

The Chino Valley Independent Fire District (CVIFD) provides fire protection, fire prevention services, emergency medical (first responder) and rescue services, arson investigation, and hazardous material coordination for the Specific Plan area. All development within the project area complies with the requirements of the CVIFD. The water supply system is designed to meet CVIDF requirements.

2.5.2 Public Transportation

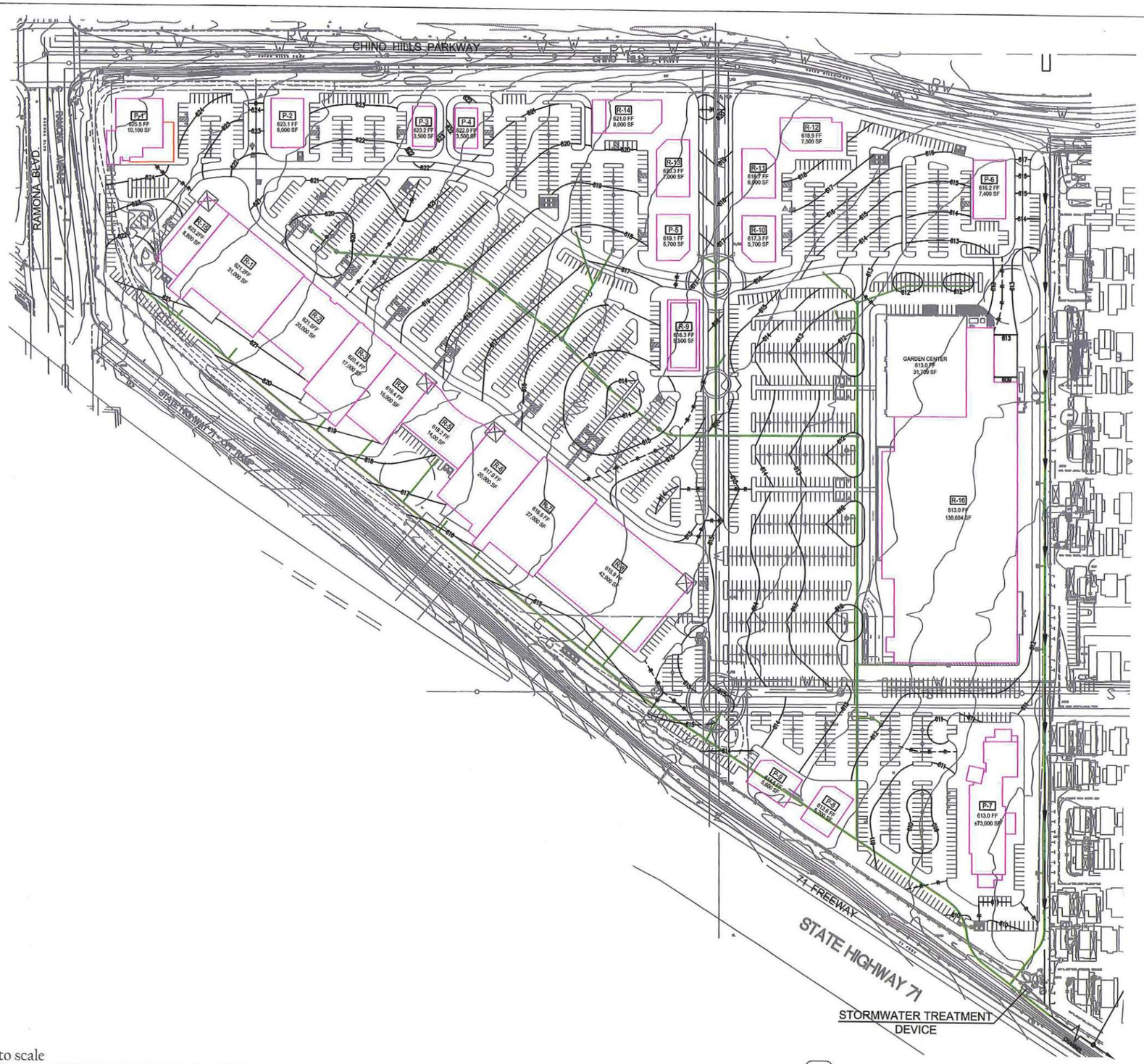
Omnitrans provides bus service for the Specific Plan area.



Conceptual Water & Sewer Plan 2.4

THE COMMONS AT CHINO HILLS SPECIFIC PLAN

Source: Canyon Consulting



LEGEND:

—613— PROPOSED CONTOUR

PROPSED STORM DRAIN

PROPOSED DRAIN INLET

Not to scale

Source: Canyon Consulting

Conceptual Grading & Drainage Plan 2.5

THE COMMONS AT CHINO HILLS SPECIFIC PLAN

3. DEVELOPMENT STANDARDS

3.1 PURPOSE

The Commons at Chino Hills Specific Plan Development Standards define the permitted uses, sizes, design of buildings and related improvements for the Specific Plan area. The Development Standards implement the Land Use Plan for the project. The Development Standards ensure that development within the Specific Plan area conforms to and contributes to realization of the goals and objectives of the Specific Plan and the City of Chino Hills General Plan. This section has been prepared in accordance with California Government Code 65450 and all applicable development and design standards of the City of Chino Hills Development Code, with some modification to provide flexibility and encourage innovative design within The Commons at Chino Hills Specific Plan area. Exhibits accompanying the Development Standards are guidelines for development, schematic in nature, and not intended as precise plans. The Commons at Chino Hills Specific Plan Development Standards shall be applied only in the Specific Plan area.

3.1.1 References

Any reference to Development Standards shall mean "The Commons at Chino Hills Development Standards." The City of Chino Hills Development Code is referred to as the Development Code.

3.1.2 Resolution of Issues

A. Whenever this Specific Plan contains regulations or standards that differ from or conflict with the regulations and standards contained in the Chino Hills Development Code or any other applicable City regulation, rule or policy, the Specific Plan shall prevail.

B. If an issue, condition or situation arises or occurs that is not sufficiently covered or provided for in these regulations so as to be clearly understandable, those regulations of the Development Code that are applicable for the most similar issue, condition, or situation shall be used and implemented in a manner otherwise consistent with the Specific Plan.

C. Definitions for terminology used in this Section of the Specific Plan, unless otherwise noted, shall comply with the definitions contained in the City of Chino Hills Development Code, Chapter 16.02.

D. All setbacks established by this Section of the Specific plan, unless otherwise noted, shall be measured in accordance with the City of Chino Hills Development Code, Chapter 16.06.050.

E. Building heights established by this Section of the Specific Plan, unless otherwise noted, shall be measured in accordance with The City of Chino Hills Development Code Chapter 16.06.100.

3.2 CONCEPTUAL SITE PLAN

Exhibit 3.1 presents a Conceptual Site Plan for The Commons at Chino Hills promotional retail center. The Conceptual Site Plan illustrates one of the potential scenarios for the locations and orientations of structures upon build-out of The Commons consistent with the objectives and Development Standards established in the Specific Plan.

3.3 PERMITTED USES

Permitted Uses for The Commons are listed in Table 3-1, below. Each use is designated as "Permitted" (P), requiring a "Conditional Use Permit" (CUP), permitted as a "Temporary Use" (T), or permitted as an "Accessory Use" (A) to a permitted use on site.

- A Permitted Use (P) is one that can be established as the primary use of a building without need of a discretionary approval (e.g. Planning Commission review) provided the use complies with applicable Zoning, Building, and Safety, and related State and local ordinances and policies.
- A Conditional Use Permit (CUP) per Chapter 16.68 of the Chino Hills Development Code is required because certain uses, due to the nature of the use, intensity, or size, require special review to determine if the use proposed, or the location of that use is compatible with surrounding uses, or through the imposition of development and use, conditions can be made compatible with surrounding uses. The Conditional Use Permit is provided for this purpose.
- A Temporary Use (T) refers to a use of limited duration that may be permitted as a primary or accessory use of a property.
- An Accessory Use (A) refers to a use customarily incidental and subordinate to the principal use of the land or building and located on the same lot with the principal use or building.

TABLE 3-1: PERMITTED USES

USE	STATUS
Alcoholic Beverage Onsite Sales as part of a family (non-age-restricted) restaurant	P
Alcoholic Beverage Offsite Sales within a specialty food store, or drug store	P
Alcoholic Beverage Offsite Sales in any store other than a specialty food or drug store, ex. Beverages & More	CUP
Amusement, Arcade, Billiard Parlor	CUP
Apparel Store	P
Appliance Sales	P
Art Gallery	P
Art Supply Stores	P
Automobile Accessory Sales and Installation (Limited overnight storage permitted)[1]	A
Automobile Body Repair[1]	A
Automobile Repair & Service[1]	A
Automobile/Truck Sales, New	P
Automobile/Truck Sales, Used[1]	A
Automobile Painting[1]	A
Automobile Service Station (with alcohol sales for off-site consumption)	CUP
Bakery, Retail	P
Barber or Beauty Shop	P

USE	STATUS
Banquet/Reception Facility	A
Bed and Breakfast	P
Bicycle Sales and Service	P
Blueprinting and Photocopying	P
Book Store	P
Bowling Alley	P
Brewery (on-site consumption at restaurant)	A
Building Materials Sales, Retail	P
Butcher Shop, Retail	P
Candy/Confectionery Sales, Retail	P
Cell Phone Antenna Site[2]	P
Cell Phone Retail Sales	P
Chiropractic/Physical Therapy Offices	P
Christmas Tree/Halloween Sales	T
Club - Athletic, Health, or Recreation	P
Coffee Roasting and Packaging, Retail	P
Coins (Collectable), Purchase and Sales	P
Construction Office	T
Consumer Electronics, New	P
Corporate Headquarters	P
Dance Studio	P
Delicatessen	P
Department Store	P
Dry Cleaner, Storefront Type w/on-site equipment	P
Entertainment Uses (see Section 3.3.2)	P
Financial Institutions	P
Floor Covering Sales	P
Florist Shop	P
Furniture Sales and/or Rental	P
Garden Equipment Sales and Service	P
Garden Supply Sales (see Section 3.3.1)	P
General Administrative Office Use	P
General Retail Use	P
Gift Shop	P
Glass Studio (stained and others)	P
Government Offices	P
Hardware Store	P
Health Food Store	P
Higher Educational Facility[3]	P
Hobby Supply Shop	P
Home Improvement Center (see Section 3.3.1)	P
Horticultural Sales (see Section 3.3.1)	P
Hotel/Motel	P
Ice Cream Parlor	P

USE	STATUS
Ice, Retail Sales	P
Interior Decorating Service	P
Jewelry Sales	P
Laboratories, Medical	P
Laboratories, Research	A
Laboratories, Testing	CUP
Locksmith	A
Marine Supply Stores	P
Massage Clinics / Day Spas	CUP
Medical/Dental Offices & Surgery Centers	P
Motorcycle Sales and Service, New	P
Movie Theaters	P
Music/Record Store	P
Newsstand	A
Nurseries, Retail (see Section 3.3.1)	A
Office Equipment/Supplies, Sales of	P
Optical Products Sales	P
Outdoor Display and Sales	A
Outdoor Food Cart Vendors (with Home Improvement Center)	A
Paint and Wallpaper Stores	P
Paper Product Sales, Retail	P
Pet Grooming	A
Pet Shop	P
Pharmacy	P
Photofinishing, Retail	P
Photographic Supplies, Sales	P
Photographic Studio	P
Professional Administrative Office	P
Real Estate Office	P
Recreational Vehicle Sales, New	P
Research and Development	CUP
Restaurant, No Alcohol Sales	P
Restaurant, With Alcohol Sales (see "Alcoholic Beverage Onsite Sales")	P
Restaurant, Drive-Through	P
Medical Supply Sales, New	P
Seasonal Sales	A
Shoe Repair/Sales	P
Specialty Food Store	P
Sporting Goods Sales	P
Stationery Sales	P
Tailor Shop	P
Telecommuting Center	P

USE	STATUS
Tile Sales	P
Toy Stores	P
Veterinarian	P
Watch Repair	P
Outdoor Food/Vending Sales	A

[1] Automobile Accessory Uses - These uses shall be accessory to a new automobile/truck dealer, or large automotive parts store only.
[2] See Section 3.3.4 for additional provisions to cell phone antenna sites.
[3] Refer to Section 3.3.3 for provision to Higher Educational Facilities.
* Interpretation of uses and compatibility of uses if not otherwise listed above is subject to interpretation by the Community Development Director.

3.3.1 Promotional Displays and Activities

Home improvement centers and certain other high-volume, promotional retailers utilize unique product display and presentation formats to remain viable in highly competitive, price-driven retail categories. The Commons Specific Plan accommodates this unique retail format for such promotional retailers and specifically permits, by right without requiring further review or approval, the following uses and activities:

A. Up to six (6) seasonal sales events or commercial activities utilizing outdoor tent structures and signage. Each sales event may continue up to forty-five (45) days.

B. Daily outdoor display and sales at the retail store front and along the front store sidewalk.

C. Outdoor food vending machines and food vendor carts near the retail store front, and/or along the front store sidewalk.

D. Outdoor storage of wood pallets and propane tanks within a walled enclosure at the rear of the store.

E. Outdoor sale of product and merchandise in a garden, including along the front sidewalk of a garden center.

F. Outdoor storage of product and merchandise in a screened enclosure at the rear of the store for temporary staging and outside storage of building products for contractor pick-up.

G. Construction and use of a recessed loading dock to accommodate three (3) semi-tractor trailer trucks at one time and including an enclosed trash compactor; loading dock to be located at the rear of the building and screened to obstruct view and minimize noise impacts on adjacent properties.

H. Conduct business 24-hours per day, 7 days per week.

I. Night time truck loading and unloading, and loading and stocking inside the building 24-hours per day, 7 days per week.

J. Parking of up to six rental trucks (Class C as defined by the Department of Motor Vehicles) and six rental utility trailers shall be limited to a location on the side of the building closest to the SR -71 freeway. (The Tool Rental Center shall be limited to a location within the store).

K. Outdoor pay telephones (Limited to a location at the front of the store).

L. Outdoor, vinyl banner signs for sales events.

M. Temporary staging of delivered product at the rear, sides, and front wall of the store will be allowed for customer pick-up and for delivery of materials to be loaded into the store.

N. Permanent display of fencing product on the outside front wall of the store.

O. Collection, staging, and storage of shopping carts outside the store on the front sidewalk and in cart corrals as needed.

P. Operation and use of a public address system in the garden center area.

Q. Garden Center may be adjacent to the retail store and enclosed in a perimeter fence outside the building envelope.

R. Outside storage of a backup generator, enclosed in a perimeter wall, that will be tested on a weekly basis per Chino Valley Fire Department guidelines and will run for ten to fifteen minutes at such testing.

S. Rental trucks (known as Load "N" Go).

3.3.2 Entertainment Uses

Primary entertainment uses shall be subject to the provisions of Development Code Section 16.12.070, "Entertainment establishments providing dancing, music, and similar activities" require submittal of a security plan to the City for review and approval. For restaurants whose primary use is an eating establishment, no security plan shall be required unless a security plan is a condition of licensing by the Department of Alcoholic Beverage Control.

3.3.3 Higher Educational Uses

Higher educational extension facilities shall be allowed as Higher Educational Uses that are a part of an accredited university or school and shall consist of classroom, meeting rooms and ancillary office space only, and be limited to the 15,000 square feet of office space. A Higher Educational use is subject to the review and approval by the Community Development Director and may require a parking analysis prior to locating within the Commons.

3.3.4 Outdoor Accessory Uses and Events

A. Periodic use of portions of the parking lot in The Commons for civic and promotional events shall be permitted. Those portions of the parking lot may be closed on a temporary basis during such events, without City approval.

   1. Civic and promotional events in the parking lot may include product displays, product promotions, and/or product demonstrations that shall be subject to restrictions imposed by common area property management and shall be exempt from Section 16.12.080, "Outdoor display and storage", of the Development Code provided such uses are consistent with the retail uses within The Commons Retail designation.

   2. Outdoor storage shall not interfere with line of sight standards as outlined in Section 3.4.3 of this Specific Plan.

B. In order to create and enhance the ambiance, an outdoor sound system may be installed to provide background music and to serve as a public address system. Noise standards contained in Table N-1 "Noise/Land Compatibility Matrix" of the City of Chino Hills General Plan Noise Element shall apply and shall be used to define acceptable and unacceptable noise levels.

3.3.5 Cell Phone Antenna Sites

The Commons Specific Plan accommodates a unique retail format and allows the following pertaining to cell phone antenna sites:

A. Cell phone antenna sites within the Commons at Chino Hills may be an antenna mounted on the interior of a freestanding structure that has been built solely for the purpose of supporting the wireless communications facility using camouflage design techniques so that the wireless communications facility is fully enclosed within the structure and the antenna panels are not visible. Typical structures used to enclose the freestanding facilities may include signs, clock towers, water towers, campanile (bell tower), or other suitable vertical structures. Such structure shall serve as a monument for the Commons at Chino Hills and may include the project name, project logo and ground-mounted up lights to illuminate the monument. The exterior color shall compliment the color of buildings within the Commons. Exhibit 3-3 provides examples of cell phone tower facilities.

B. The Commons at Chino Hills shall be granted a minimum of one (1) cell phone antenna site, subject to Site Plan Review.

C. A cell phone antenna site within Commons at Chino Hills Specific Plan area may be located on its own parcel. A ground mounted facility shall not be required to be located in the side or rear yard of a property.

D. The maximum height of a cell phone antenna or structure supporting the communications facility shall not exceed seventy feet (70').

3.4 DEVELOPMENT STANDARDS

Minimum site development standards are those of the "C-F, Freeway Commercial District" set forth in Section 16.12 of the City of Chino Hills Development except as otherwise indicated herein. Table 3-2 sets forth the site development standards for The Commons at Chino Hills.

TABLE 3-2: DEVELOPMENT STANDARDS

Development Standard	Minimum/Maximum Required
A. Minimum Lot Size	2,500 Square Feet
B. Minimum Lot Dimensions Width Depth	 50' feet 50' feet
C. Maximum Height Major Retail[1] Minor Retail[2] Office Hotel	 50' feet to roofline; 60' feet to top of architectural feature 25' feet to roofline; 35' feet to top of architectural feature 80' feet to roofline; 90' feet to top of architectural feature 80' feet to roofline; 90' feet to top of architectural feature

Development Standard	Minimum/Maximum Required
D. Landscaping Required	Minimum 10% must be landscaped (may include planted areas & enhanced hardscape)
E. Parking Lot Landscaping	Minimum 2% of parking areas (exclusive of loading areas) must be landscaped. This landscaping may be counted toward the total site area landscaping required in item D above.
F. Maximum Floor Area Ratio (FAR)[3]	No maximum floor area ratio.
G. Minimum Street-Side Building Setbacks From Chino Hills Parkway From Ramona Avenue From State Highway 71 From Easterly Tract Boundary	 20' Feet 15' Feet 15' Feet The building setback shall be equal to or greater than the total height of the proposed building
H. Minimum Setback at Drive Aisles, Parking Areas, and/or between Buildings	None Required
I. Minimum Open Space[4]	None Required

[1] A major retail store is a minimum 10,000 square feet and above.
[2] A minor retail store is 1,000 – 10,000 square feet.
[3] As outlined in Development Code Section 16.12.040, Table 25-1. No maximum floor-to-area ratio.
[4] As outlined in Development Code Section 16.08.070. No open space dedication required.

3.4.1 Projections into Building Setbacks

All required setback areas shall be open and unobstructed from finished grade to the sky except for landscaping and projections into street-side setback areas as indicated in Table 3-3.

TABLE 3-3: PROJECTIONS INTO BUILDING SETBACKS

Feature	Maximum Projection
Antennas/Satellite Dishes	2'0"
Awnings	3'0"
Architectural Projections: Cornices, Eaves, Roof Overhangs	4'0"
Patios, Open & Enclosed	5'0"
HVAC, Mechanical Equipment[1]	5'0"
Signs	Per the approved sign program
Pad Transformers and Above Ground Utility Cabinets[2]	5'0"

[1] All air conditioning units and mechanical equipment shall be screened from view by solid walls with exterior finishes to match or compliment surrounding buildings and uses.
[2] Shall be screened from view with landscaping.

3.4.2 Clear Area

A clear corner area for sight visibility purposes shall be provided at the intersections of all streets, as provided in Section 16.06.080, Clear areas, in the City of Chino Hills Development Code.

3.4.3 Temporary Structures and Uses

A. Temporary Construction Office ("TCO"): A TCO temporary construction office, used during the construction of the buildings on The Commons site, shall be permitted subject to the following conditions:

1. A TCO temporary construction office may not be used by any general contractors, subcontractors, furniture installation firms or other related firms completing work on The Commons development. There may be storage bins housing material on the site that is not considered a TCO and therefore no permit is required.
2. A TCO may be partially used as a leasing/sales office, where at least 50% of the space in the Temporary Construction Office is for the conduct of onsite construction activities.
3. The TCO temporary office may consist of a manufactured home, commercial coach, self-contained recreational vehicle, mobile office, or modular structure or vehicle erected or installed with Uniform Building Code requirements for temporary construction office.
4. Due to construction phasing, a TCO temporary construction office may remain on-site for a maximum of ninety (90) days after the last Certificate of Occupancy is issued for the project.
5. Issuance of the Temporary Use Permit for the TCO use shall not require a drinking water contract or letter of service.
6. The Temporary Use Permit shall be for a period of no greater than twenty-four (24) months.
7. There may be multiple TCOs on the site.
8. TCOs may be relocated anywhere on site, without approval of the City or the requirement for any additional permit fees.
9. The TCO shall only need to comply with the following and all other terms and conditions and/or requirements (inclusive of the Site Plan Checklist) of the City's Temporary Use Permit Application shall not apply:
    i. Name including addresses and telephone numbers of the owner and lessee's of the TCO.
    ii. Pumping Contract (copy of such contract); one contract can suffice for all TCOs on the entire site that are utilizing the same service.
    iii. Drawing showing the location of the proposed TCO.
    iv. The amount of temporary parking spaces and the location of such spaces on the site servicing the TCO.
    v. Plan showing handicap access to the TCO
    vi. Payment of a Temporary Use Permit and Set-down Building Permit Fee (there shall be no Cash Deposit required)

vii. Seismic tie-down drawing shall be required from the TCO provider. A wet sealed certified engineer of record, stamped drawing from such engineer will not be required.

3.4.4 Trash Enclosures / Refuse Bins

A. Receptacles (bins) for the collection of refuse and recyclable materials generated within The Commons Retail designation shall be generally located as shown on Exhibit 3.1, Commons Retail Conceptual Site Plan.

B. All trash enclosures shall be designed with a walk-in access component.

C. Enclosures shall be provided for bins and shall consist of six (6) foot-high split face block masonry walls, and solid, view-obscuring gates with self-closing devices.

3.4.5 Walls and Fences

A. Walls and/or fences, including retaining walls, may be permitted along the street and within street-side setback areas, provided they are outside of the public right-of-way and do not exceed four feet (4') in height. Location and design of a wall or fence is subject to review and approval by the Community Development Director or designee.

B. All walls shall be made of split-face block masonry walls, concrete tilt panels or of comparable material as approved by the Community Development Director or designee. Walls shall be compatible with the architectural theme.

C. Perimeter walls up to nine feet (9') in height may be permitted along the southern and eastern property lines. This specifically excludes property lines adjacent to Chino Hills Parkway and Ramona Avenue. The Commons

3.4.6 Parking and Loading

A. The Commons integrates a variety of retail goods and services uses with varying parking requirements, peak hour parking demands, and vehicle loading needs. Flexibility in meeting these varying requirements and demands is accommodated through inclusion of on-site parking and loading areas as part of the common area shared by tenants and occupants of The Commons Retail. Access to and use of common area shared parking shall be maintained through real property agreements applicable to all uses in The Commons Retail designation.

B. The location of parking and loading facilities shall be generally as shown on Exhibit 3.1, "Conceptual Site Plan."

C. Parking shall be provided at the rate of four (4) spaces for each one thousand (1,000) square feet of Gross Leasable Area; hotel and motels are excluded from this provision. Gross Leasable Area (GLA) is defined as the total space designed for exclusive use of the tenant and generally excludes common area and space devoted to heating, cooling, and other equipment of the building, including shafts or structural members, electrical rooms, stairwells, elevators and elevator equipment rooms, and emergency fire exits. If the calculation of required parking spaces results in a fractional number (greater than 0.5), that number shall be rounded up to the next whole numbered parking space.

D. Parking for hotels and motels shall be provided at the rate of one (1) space per guest room. Restaurant, meeting rooms, banquet/reception facilities, convention space or any other accessory uses within the hotel/motel shall provide a parking rate of four (4) spaces for each one thousand (1,000) square feet.

E. Restaurants with drive-through areas must provide at least 3 on-site queing spaces for patron vehicles ahead of the menu board or as approved by the Community Development Director.

F. Any restaurant less than 2,500 square feet shall be considered retail for parking purposes.

G. Parking facility development standards:

1. Parking space dimensions - The minimum size of a parking space shall be nine feet (9') wide and nineteen feet (19') long including the two foot (2') curb overhang, if applicable. The minimum size of a handicapped parking space shall be as directed by Title 24 of the California Code of Regulations.

2. Parking access - The minimum width of required fire access parking lot drive aisles shall be twenty-six feet (26').

3. All parking spaces and associated driveways shall be entirely paved with concrete or asphalt-type surfacing per City standards and requirements

4. Pavement graphics, directional signs and arrows shall be provided on parking lot drive aisles.

5. Parking space delineation – All parking spaces shall be clearly marked with paint or another easily distinguishable material and all spaces shall be delineated with double lines.

H. Valet parking – Valet parking shall be permissible within The Commons Specific Plan.

1. Valet parking may be provided anywhere on-site by Commons retail management.

2. The number of proposed parking spaces to be utilized shall be sufficient to ensure that the valet parking operation should not unduly affect the availability of on-site parking spaces.

3. The proposed traffic flow and location of the valet station or stations should not create undue traffic congestion in the area proposed for the valet service

I. Loading Space Requirements:

1. Number of spaces – Loading areas shall be provided within The Commons Specific Plan site.

2. Dimensions – - The minimum size of a loading space shall be at least ten feet wide (10') with a minimum length of 20 feet (20').

J. Bicycle Parking Standards:

1. Five (5) bicycle parking/storage spaces shall be located in one, area/location within The Commons Specific Plan site.

2. The Commons shall be exempt from Section 16.34.110, "Bicycle parking standards", of the Chino Hills Development Code.

3.4.7 Trip Reduction Program

The Commons shall be exempt from Section 16.36, "Trip Reduction Program", of the Chino Hills Development Code.

3.4.8 Signs

Details on The Commons at Chino Hills Specific Plan signage program can be found in the Sign Program.

3.4.9 Architecture and Design

A. Design guidelines for The Commons at Chino Hills recognize the value of brand recognition for retailers with multiple store, restaurant, or hotel locations. A retailer with multiple stores, restaurants or hotels typically employs a format that is common among locations and may include standardized signs, architecture, design, interior and exterior colors, forms, shapes, materials, and the display of standardized logos to promote and enhance the company's image, products or services. Multiple store, restaurant or hotel retailers include those whose market areas may be the local area or regional, national or international markets. Accordingly, each tenant that is part of a multiple location retail, restaurant or hotel/motel organization shall be permitted to construct and improve premises at The Commons that are consistent with that company's prototype format, including but not limited to, standardized signs, architecture, design, interiors, and exterior colors, forms, shapes and materials, and the display of standardized logos, sign text, script, color, outdoor eating & assembly areas, patios, entrances, awnings and text thereon, lighting, and landscaping and shall not be subject to City review and without restriction or condition except as to size, bulk, height or location restrictions applicable throughout The Commons at Chino Hills.

B. Additional details on the design and architecture of The Commons at Chino Hills can be found in Section 4, *Design Guidelines.*



Conceptual Site Plan 3.1

Not to scale
Source: KKE Architects



OVERALL BLDG ELEVATION



PARTIAL ELEVATION - A

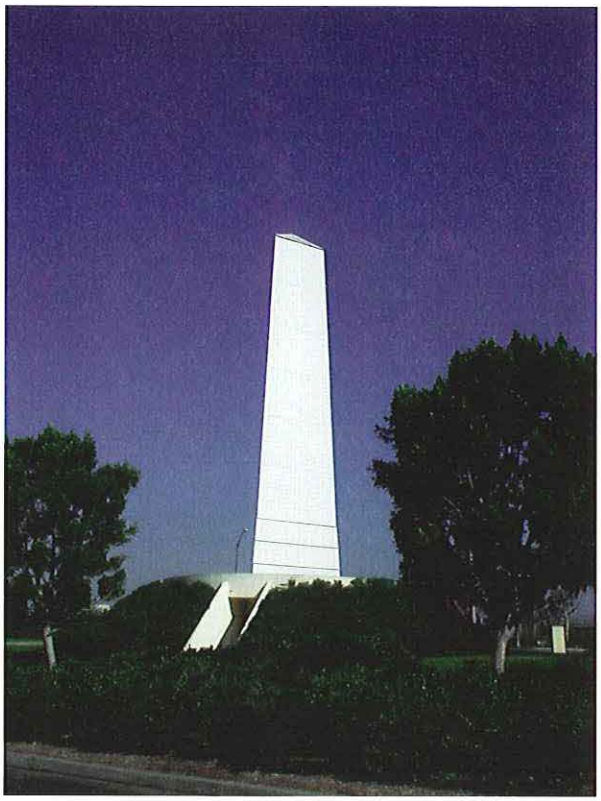




KEY PLAN

Not to scale
Source: KKE Architects

Conceptual Elevations 3.2





Cell Phone Tower Examples 3.3

4. DESIGN GUIDELINES

4.1 PURPOSE AND INTENT

The Commons at Chino Hills Design Guidelines provide a general framework for architecture, landscaping, entry monumentation and signage in order to ensure a high-quality development. These guidelines are intended to provide criteria for design, while allowing flexibility for architects, landscape architects, developers, builders and others involved in the development of The Commons at Chino Hills. The Design Guidelines are subject to modification over time so as to allow for response to unanticipated conditions such as changes in taste, community desires and the marketplace.

While encouraging uniqueness among tenants, the Design Guidelines for The Commons recognize the value of brand recognition for retailers with multiple store/restaurant locations. A retailer with multiple stores/restaurants typically employs a retail or restaurant format that is common among locations and may include standardized signs, architecture, design, interior and exterior colors, forms, shapes, materials, and the display of standardized logos to promote and enhance the company's image, products or services. Multiple store retailers include those whose market areas may be the local area or regional, national, or international markets. Accordingly, each tenant that is part of a multiple location retail or restaurant organization shall be permitted to construct and improve premises at The Commons that are consistent with that company's retail or restaurant prototype format including, but not limited to, standardized signs, architecture, design, interior and exterior colors, forms, shapes, and materials, and the display of standardized logos, sign text, script, color, outdoor eating areas and patios, awnings and text thereon, lighting, and landscaping and shall not be subject to City review and without restriction or condition except as to size, bulk, height, or location restrictions applicable throughout The Commons.

The photographs, sketches, and other graphic representations in these Design Guidelines are offered as general visual aids in understanding the basic intent of the design theme and its key implementing elements. The design components described in this document are for informational purposes and are to be used in identifying the desired design compositions for the site. Design components are provided as a palette of character, materials, and colors defining elements that should be reflected in the commercial mixed-use design proposal.

4.2 DESIGN THEME

A Contemporary style is the overall design theme for The Commons at Chino Hills Specific Plan. All buildings in this area, whether in-line or freestanding, will utilize elements complementary to selected style though unique and creative designs are encouraged in order to provide variation and interest in this development. Refer to Exhibit 4-1 for examples of buildings designed with a Contemporary architectural theme.

The primary design characteristics for the Contemporary style may include:

- Simple repeated forms and massing;
- Squared tower elements at entry;
- Enhanced articulation and details of entries, windows, doorways;
- Natural, contemporary appearance with warm, deep colors; enhanced stone and details.

4.3 BUILDING FORM & MASS

The highly-visible location of The Commons adjacent to the Chino Valley Freeway (SR-71) and to Chino Hills Parkway provides a significant opportunity for business development and for making a strong statement about the character of the City of Chino Hills. Therefore the following design considerations should be kept in mind during the site planning and design for commercial centers in this location:

- Project a positive public image, enhancing the function and aesthetics of the center by integrating buildings with landscape and/or structural elements.
- Provide variation in plan, form and function of buildings and resulting adjacent spaces both inside and out with the use of recesses, pop-outs, positioning and relationships of buildings.
- Avoid monotony and repetition in building elevations and street scene by varying building heights, massing, and rooflines, design elements, color, texture and materials, building placement and landscape.
- Avoid long, uninterrupted building planes by designing in smaller components, varying massing and/or treating facades as a series of individual units, providing overhangs or shadow elements for shade and interest.
- Articulate all primary building elevations, providing visual interest in window patterns, size and placement and integrate overhangs and other external elements into the overall building design.
- Design with a level of detail consistent with the scale of the buildings throughout the shopping center.
- Where appropriate, adhere to community design character and style requirements, providing complementary buildings, ancillary structures and landscape elements in conjunction with these standards.
- Rooftop mechanical equipment is screened from view in a manner consistent with the architectural character of the building.

4.4 DETAILS & MATERIALS

Building details indicated below are articulated through the architectural vocabulary of the Contemporary style.

- Articulation of building elements, both vertically and horizontally;
- Accentuated entries;
- Contemporary textured building materials, (stone, etc.);
- Metal grillwork and trellises, though not traditional, should complement the traditional elements of this style;
- Traditional style lighting fixtures;
- Light to dark earth tones color palette;
- Square tower elements at entries and focal points.

4.5 OUTSIDE FURNISHING

Outside furnishing include but are not limited to light fixtures, bollards, benches, trash receptacles, and signage. An appropriate style of furnishing for the theme of the project may be selected and utilized at appropriate locations throughout the development. The Commons includes a variety of uses and tenants. As a destination location, many visitors are on-site for several hours and move between uses on foot. Special care is taken to furnish amenities for these pedestrians such as:

- Bench Seating. Public seating allows the pedestrians to sit down, relax, and people watch.
- Trash and Ash Urns. Trash receptacles and, where possible, recycling containers are provided as well as ash stands for extinguishing smoking materials.
- Seat Walls. Retaining walls in outdoor public spaces may include integrated seating surfaces.
- Bicycle Rack. Bicycle racks are located in well-lighted areas and placed in a location visible from entrances and/or parking areas.
- Drinking Fountains, Planting Pots, Saucers (moveable) and Planting Boxes. These may be placed near public walkways without obstructing them.
- Entry Pylon. Entry pylons provide an "entry experience"

4.6 ENTRYWAYS

Enhanced entry features and landscaping are located at the major corners and entries to The Commons project site. Exhibit 4-2 provides examples of corner and entry features.

4.7 OUTDOOR LIGHTING

The lighting requirements of the City of Chino Hills Landscaping and Lighting Manual, 1992 and the Chino Hills Municipal Code are waived and shall not apply to The Commons. All lighting shall be subject to approval by the Community Development Director or designee. Exterior lighting shall be energy-efficient and shielded or recessed so that direct glare and reflections are contained within the boundaries of The Commons and shall be directed downward and away from adjoining properties and public rights-of-way. No lighting shall blink, flash, or be of unusually high intensity or brightness. All lighting fixtures shall be appropriate in scale, intensity, and height to the use being served and consistent with the following:

Parking lot lights shall not exceed forty (40') in height. Lighting of outdoor areas shall be designed and maintained in a manner to prevent glare or direct illumination from intruding into off-site areas. Illumination patterns overlap, creating an even level of illumination throughout the parking area. Pedestrian level lighting is used along pedestrian walkways. All lighting is located and aimed away from adjacent properties and roadways as consistent with City of Chino Hills lighting guidelines. All lighting fixtures shall be appropriate in scale, intensity, and height to the use it is serving.

Basic lighting types include but are not limited to:

- Street pole lighting along principal circulation paths (sidewalks);
- Ground-mounted bollard lighting along pathways/parking areas;
- Decorative lighting fixtures integrated into/atop entry pylons/gates;

- Elevated pole lighting at parking lots;
- Below-grade uplights;
- Ground-mounted up lights to illuminate landscape, etc;
- Building up-lighting discreetly mounted above human eye points;

  Strung lighting cross paseos/terrace areas (including seasonal lighting).

4.8 PAVING

Enhanced paving will generally be located along the storefront walkways, primary pedestrian crosswalks, and at the main entrance to The Commons from Chino Hills Parkway. Enhanced paving may include the following materials:

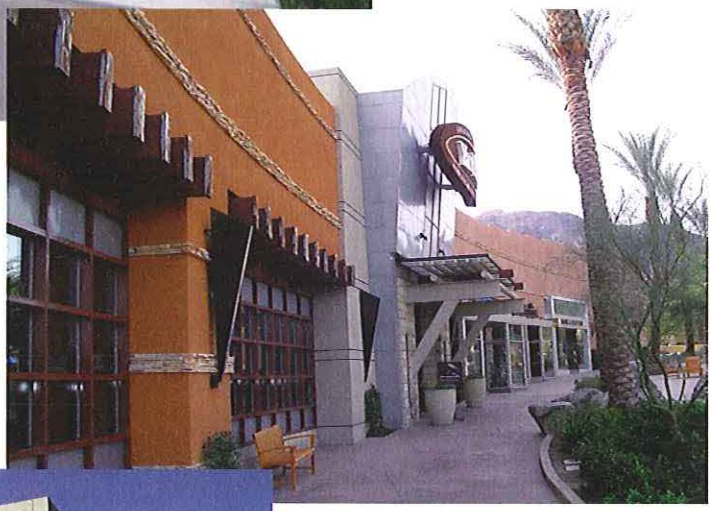
- Integral colored concrete with saw cut pattern including sandblast or acid wash finish;
- Concrete interlocking paving units with accent bands;
- Natural grey concrete with saw cut pattern including a sandblast or acid wash finish with paver accents or borders;
- Any combination of the above materials, pattern and finishes.









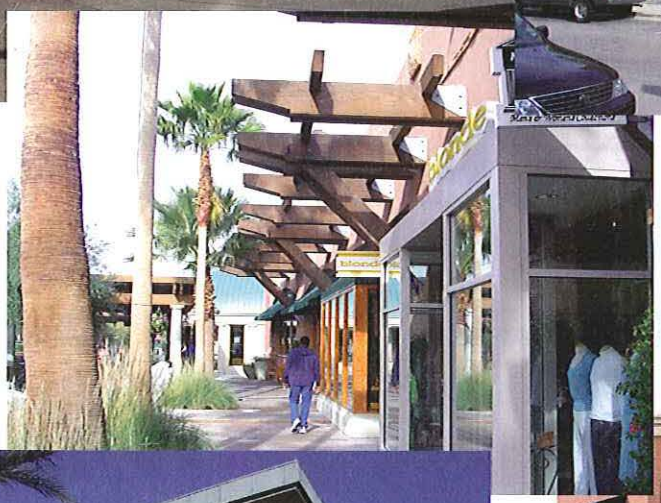


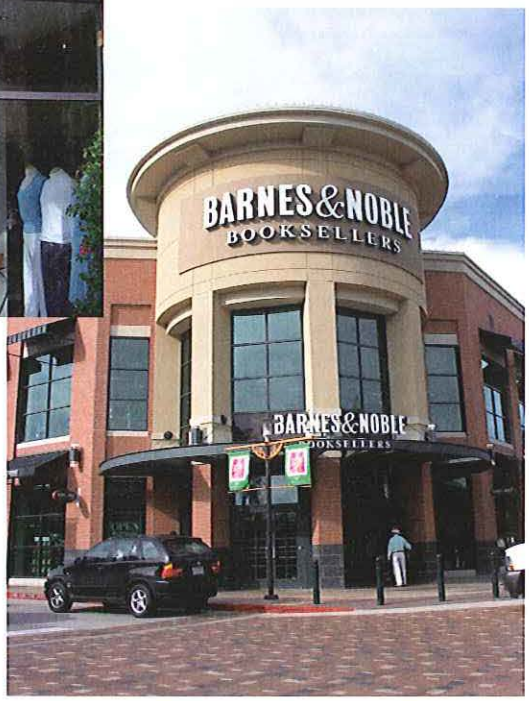


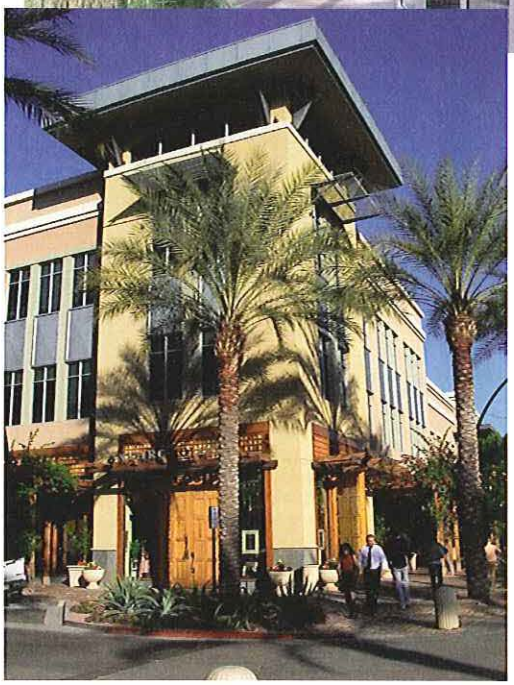
Building Design Examples 4.1











Corner Entry Features 4.2

4.9 SIGN PROGRAM

Signs within The Commons at Chino Hills provide for tenant identification signs and directional signs utilizing colors, materials, finishes, and illumination so as to complement one another and be consistent with the upscale character of the Specific Plan area. The overall character of the signage and graphics for The Commons is one of that reflects the variety and uniqueness of the architecture. Signs are compatible with the pedestrian scale of the environment rather than that of a larger vehicular-scaled venue. In recognition of these distinct characteristics, a Sign Program for the Commons at Chino Hills has been submitted to the City and is summarize in the following subsections. The Commons Sign Program will feature on-site advertising including the names of the businesses operating within the Specific Plan area and the Reader Board can be utilized to advertise special promotional/sale items sold by on-site tenants. The general location of the major signs for The Commons at Chino Hills may be as generally shown on Exhibit 4.3, Conceptual Sign Locations, and described in the following sections.

4.9.1 Media Program

The Commons shall include a Media Program as part of the overall development of the project. The Media Program will consist of various forms of advertising including Freeway Pylon Signs, temporary banners, wall signs, back lit Duratrans, directories, kiosks, static sticker/signs and the use of a Reader Board consisting of an LED, Plasma or tri-vision display. The Commons at Chino Hills' Media Program will feature on-site advertising uses that address the target audience of visitors to The Commons at Chino Hills. Advertising would include, but not be limited to, promoting on-site tenants, restaurants, hotel promotions, sales, dining, specific activities, events or seasons. (See Section 4.9.14 for a list of prohibited advertisers)

The City of Chino Hills would be able to provide content to The Commons at Chino Hills for inclusion on the Reader Board sign, with the use capped at one slide every 5 minutes of broadcast time, and the slotting of such time as determined by The Commons at Chino Hills.

4.9.2 Wayfinding Signs

The wayfinding signs help the visitor navigate through an urban environment. The graphics, like in many similar urban environments, help to create a sense of orientation for the first time visitor, and a sense of comfort for those that return often.

4.9.3 Pylon / Reader Board

Located along the freeway, one(1) Pylon/Reader Board sign may be up to 100' feet tall and three (3) Freeway Pylon signs may be up to 65' feet tall and indicate "The Commons at Chino Hills," a project logo or icon, "City of Chino Hills," and the names of the tenants. Maximum sign area is 2,000 square feet per side. Letter height will be no more than 72" inches. An electronic reader board may be included to identify upcoming on-site cultural events and other on-site events that are in compliance with the approved Sign Program. Exhibit 4.4 illustrates examples of Freeway Pylon/Reader Board Signs and Exhibit 4.5 illustrates examples of the Freeway Pylon Signs.

4.9.4 Major Site Identity Monuments

Located at major corners to the project, the major site identity monuments are of sizes appropriate to be readable from vehicles traveling at speeds of up to 50 miles per hour. Individual dimensional letters and

logo will identify the project. The letters and logo may be internally illuminated. Exhibit 4.6 illustrates examples of Major Site Identity Monuments.

4.9.5 Tenant Monument Signs

The tenant monument signs will be located along Chino Hills Parkway and will be at a scale appropriate to be read from within a vehicle. Illumination of the identity plaques will be from the ground or a wall mounted external source, not internally illuminated. Exhibit 4.7 illustrates examples of Tenant Monument Signs.

4.9.6 Vehicular Scaled Directional Signs

Located at vehicular intersections on-site, these signs guide the visitor to different uses on the site such as to offices, major anchors, and municipal buildings. The project name is located on the sign in a smaller, more understated way so as not to detract from the listings. Exhibit 4.8 illustrates examples of Vehicle Scaled Directional Signs.

4.9.7 Pedestrian Scaled Directional Signs

This sign type is used to direct the pedestrian to various on-site uses and is located along major paths of travel on sidewalks and in gathering areas. Pedestrian-scaled signs also point the way to amenities such as public restrooms, security, information booths, and elevators. The signs are pole or ground-mounted and include appropriate text and arrows. Exhibit 4.8 illustrates examples of Pedestrian Scaled Directional Signs.

4.9.8 Project Directory Signs and Community Board

Project directory signs are located in at least two prominent positions on the Retail Commons Site. The signs include a map of The Commons and indicate all uses/tenants so as to allow visitors to orient themselves and proceed to any destination shown. Exhibit 4.9 illustrates examples of Project Directory Signs and Community Board.

4.9.9 Site Pageantry

Site pageantry consists of fabric or metal banners that are attached to light poles or building facades throughout the project. They are a part of themed graphics of the project and may include the project's name and/or logo, holiday or special event greetings and are not intended for display of tenant graphics. Site Pageantry will be concentrated along the perimeter streets of the project and at major entrances to the site. Exhibit 4.10 illustrates examples of Site Pageantry.

4.9.10 Regulatory Signage

The street and passage name identities will be in the form of traditional street signs that will be freestanding or mounted to a pole light, or mounted on building walls adjacent to street or sidewalks. The design of the signs will be reflective of the theme of the overall project. Other site regulatory signs such as stop signs, parking signs, handicap parking signs, service areas, etc. will incorporate elements of similar to the street identity signs. Exhibit 4.11 illustrates examples of Regulatory Signage.

4.9.11 Tenant Identity Signage

Tenant identity signage mounted to building facades is located throughout The Commons at Chino Hills. Signage is an integral design feature of each tenant's storefront design. Each tenant storefront is designed to complement the design of the overall facade and building design. Individual tenants are encouraged to use a mixture of urban signage techniques to give variety and the appearance of having evolved in a high-end urban setting. An eclectic mix of dimensional signage will be encouraged to create a sense of uniqueness and variety along the streetscape.

Sign formats for tenant signs may be applied in the following fashion depending on location and storefront design:

- Fascia signs;
- Blade signs;
- Lettering and graphics on valances or awnings;
- Signage applied to the glass show windows, storefronts and entrances;
- Inlaid floor graphics;
- Wall mounted plaques and
- Signage applied to canopies.

Acceptable sign types include:

- Dimensional metal, glass or other material with a permanent appearance indirectly lit;
- Reverse channel letters with halo illumination, with opaque face and sides and non-reflective background;
- Embedded, flush, recessed box signs of an opaque material with push through, translucent copy;
- Incised letters cut into or cast out of an opaque material and indirectly lit;
- Sculptured, iconographic elements contextual to the storefront design;
- Internally illuminated channel letters or logo.

In general, all tenant signage must be proportionate to the storefront and building design as well as the urban nature of the street. Each tenant is allowed primary building fascia signage for each elevation facing the common area, with additional blade, show window, wall plaques, floor, awning, and canopy signs and wall signs for secondary elevations which face the perimeter of the project area in accordance with the City approved sign program for the project. No sign will exceed sixty-six percent (66%) of storefront width. Blade signs will be mounted to allow an eight foot (8') minimum clearance above the walkway. Exhibits 4.12 and 4.13 illustrate examples of Tenant Signage.

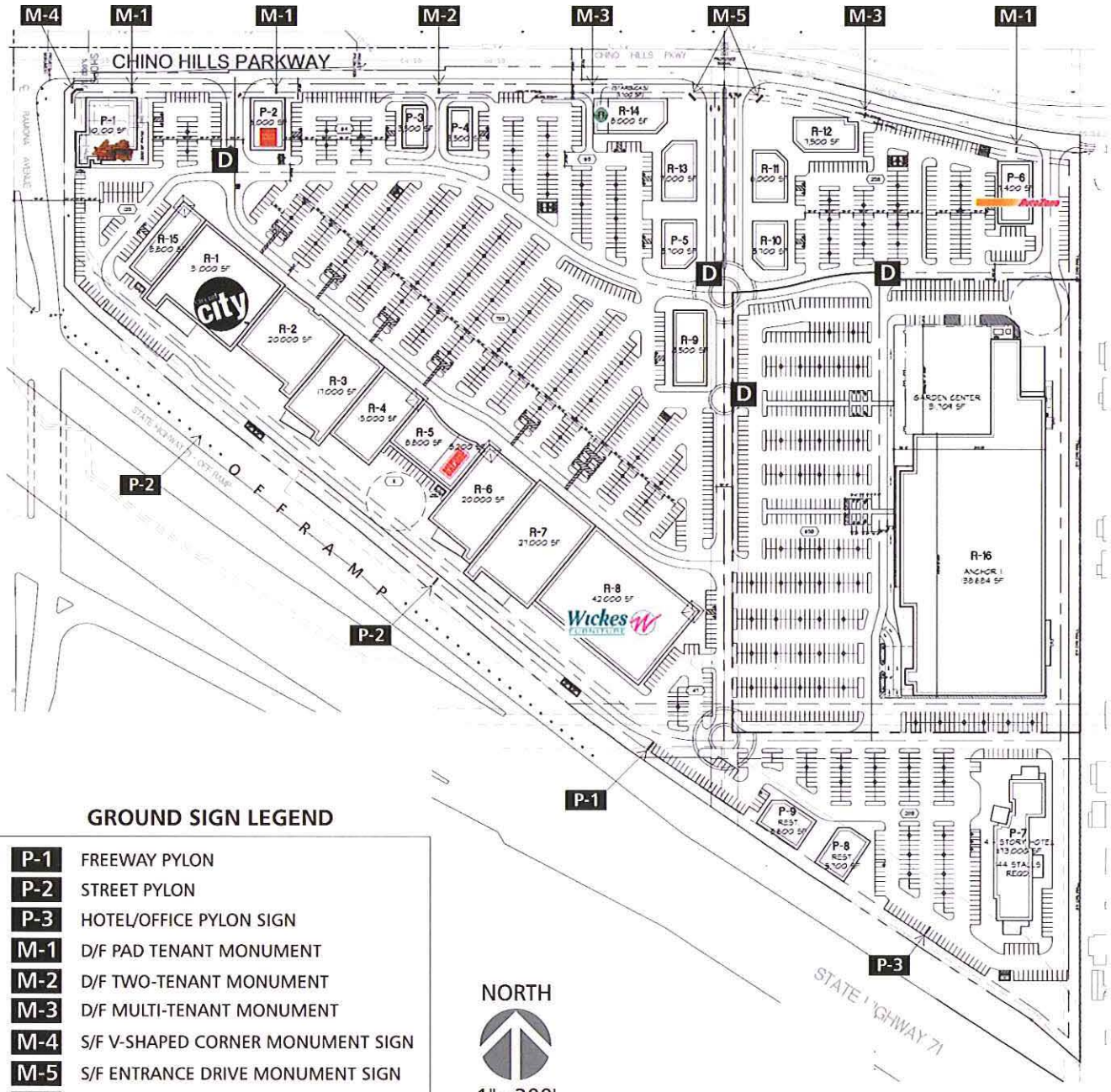
4.9.12 Temporary Signs

Temporary signs not visible from the public right-of-way are permitted, subject to Community Development Director or designee review and approval of a sign program. Pending City approval of said sign program, such temporary signs may not be subject to issuance of a temporary sign permit by City and not otherwise subject to restriction unless such signage is declared hazardous or unsafe by the City.

Temporary signs visible from the public right-of-way, other than those indicated in Section 3.3.1 Promotional Displays and Activities, are subject to the City of Chino Hills Development Code.

4.9.13 Prohibited Signage

- No signage or advertising which is prohibited by the approved sign program for the Commons shall be permitted.
- Advertising of businesses and services not located within the Specific Plan area; and advertising products which are not currently a special or promotional sale by an on-site tenant.

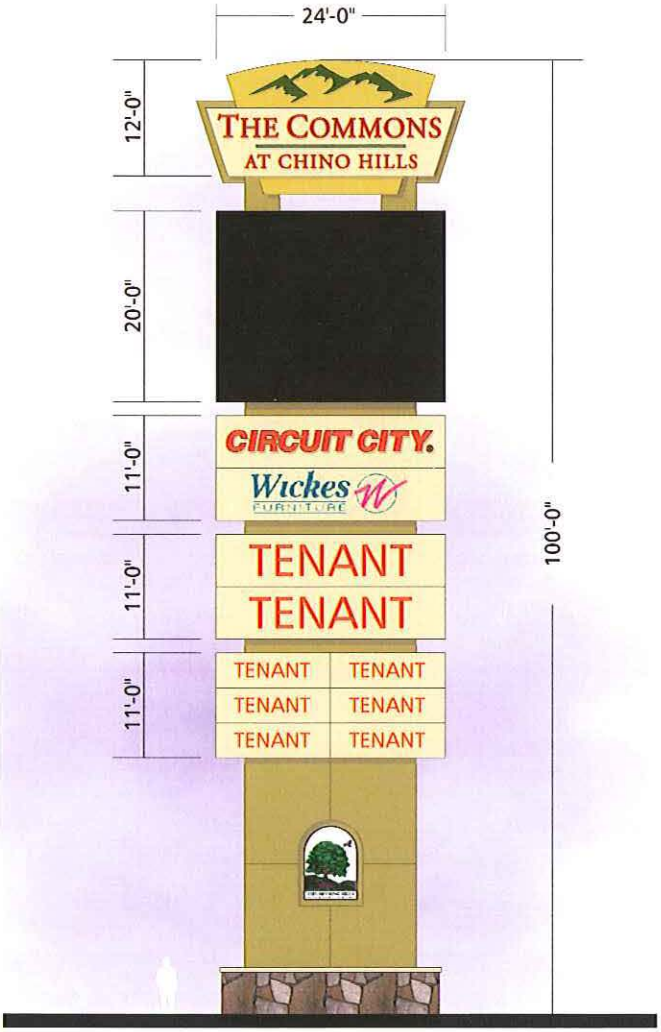


GROUND SIGN LEGEND

P-1	FREEWAY PYLON
P-2	STREET PYLON
P-3	HOTEL/OFFICE PYLON SIGN
M-1	D/F PAD TENANT MONUMENT
M-2	D/F TWO-TENANT MONUMENT
M-3	D/F MULTI-TENANT MONUMENT
M-4	S/F V-SHAPED CORNER MONUMENT SIGN
M-5	S/F ENTRANCE DRIVE MONUMENT SIGN
D	VEHICULAR DIRECTIONAL

Conceptual Sign Locations 4.3

Not to scale
Source: Signage Solutions

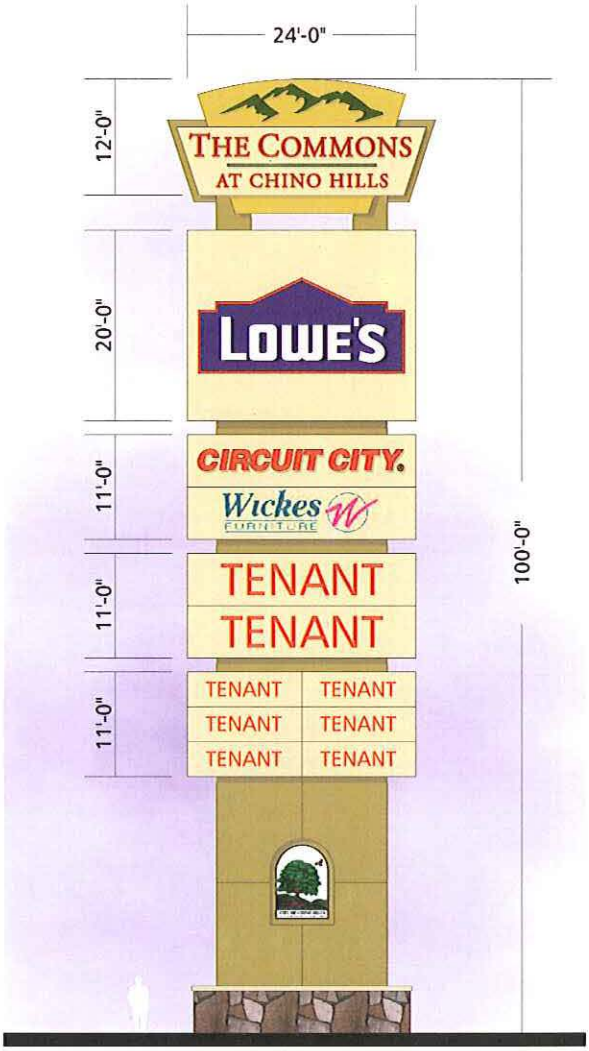


P-1

FREEWAY PYLON SIGN CONCEPT - MULTIPLE TENANTS AND L.E.D.DISPLAY

Scale: 1/16"=1'-0"

Note: Tenant panel artwork to be finalized separately. Not for production.



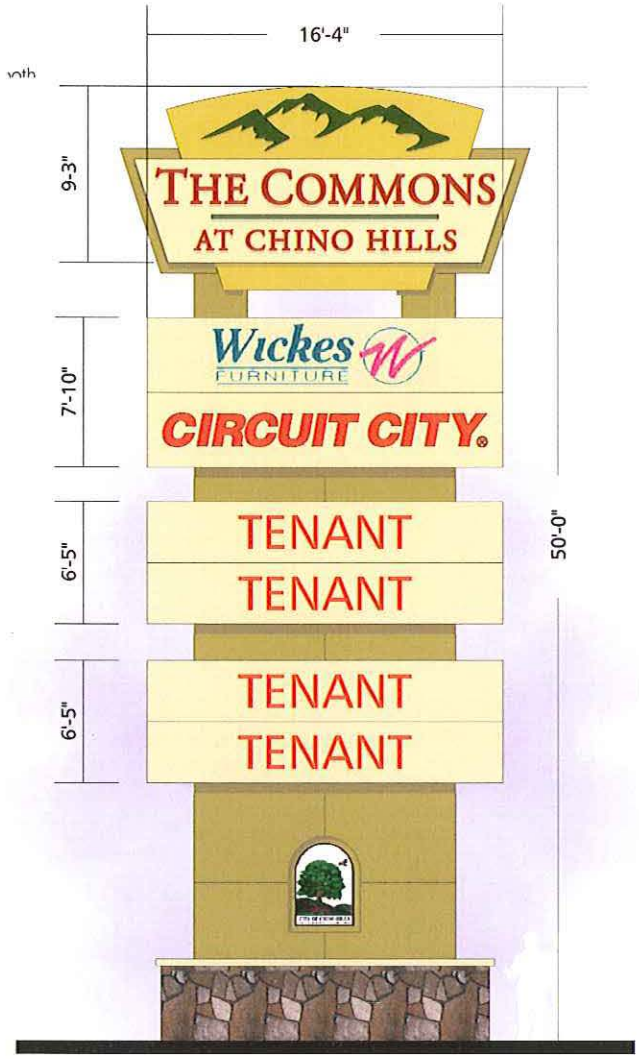
P-1

FREEWAY PYLON SIGN CONCEPT - MULTIPLE TENANTS

Scale: 1/16"=1'-0"

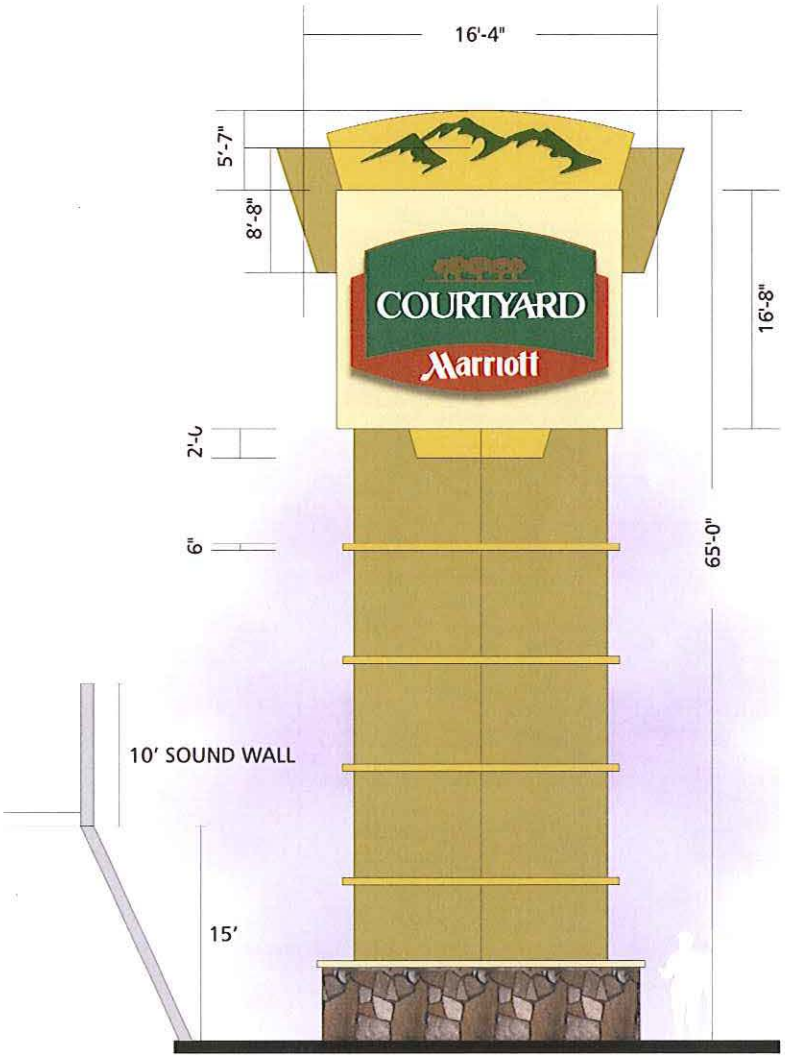
Freeway Pylon Reader Board Sign Concept 4.4

Source: Signage Solutions



P-2 Scale: 1/8"=1'-0"

STREET PYLON SIGN CONCEPT
(Height allowed within 500 ft. of fwy)



P-3 Scale: 3/32"=1'-0

FREEWAY PYLON SIGN CONCEPT

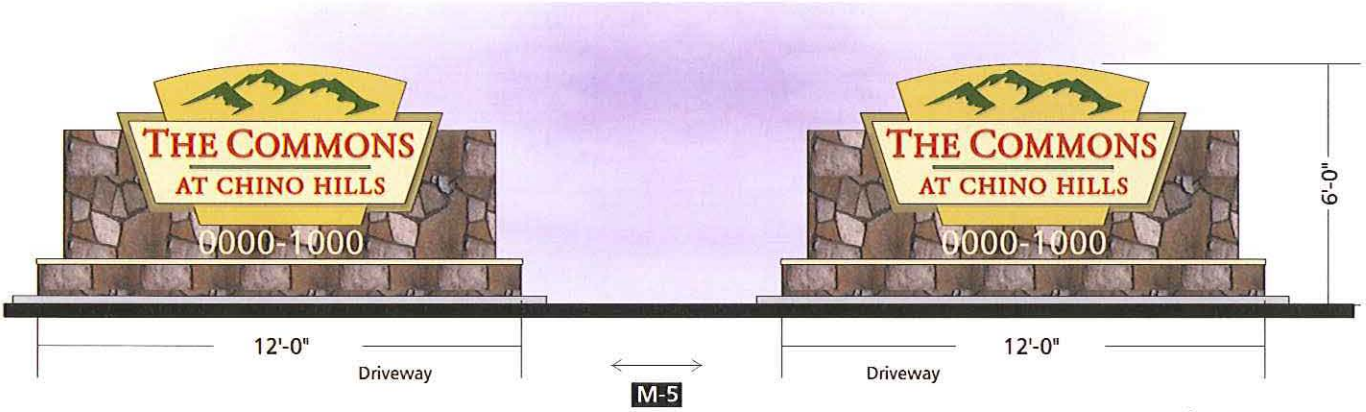
Freeway Pylon Sign Concept 4.5



M-4

S/F V-SHAPED CORNER MONUMENT SIGN

Scale: 1/4"=1'-0"



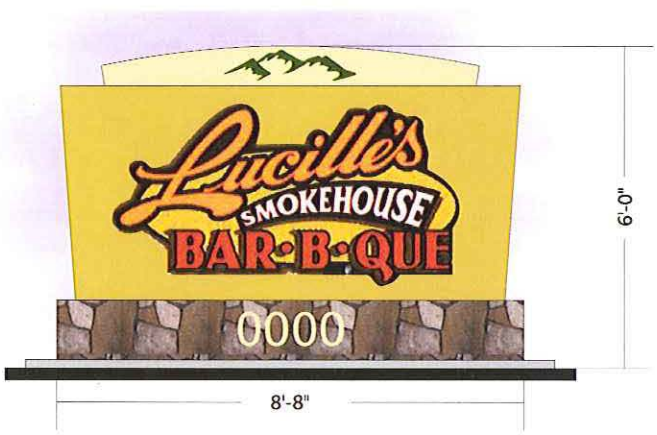
M-5

S/F ENTRANCE DRIVE MONUMENT SIGNS

Scale: 1/4"=1'-0"

Major Site Identity Monuments 4.6

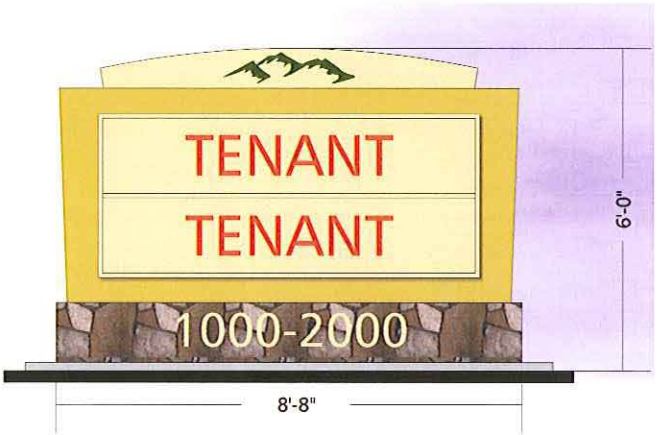
Source: Signage Solutions



MONUMENT SIGN CONCEPT - PAD TENANT

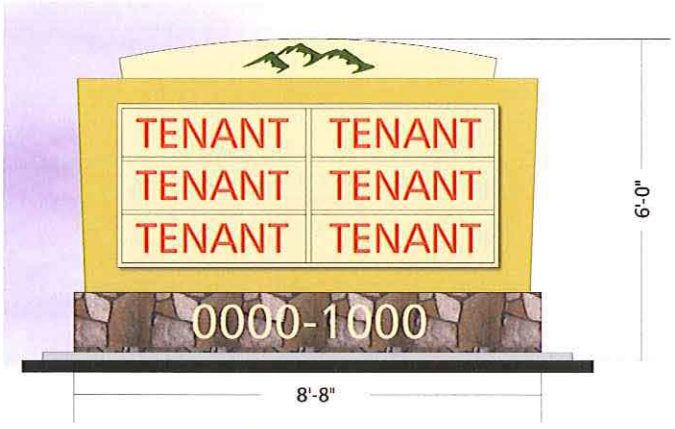
M-1

Scale: 3/8"=1'-0"



MONUMENT SIGN CONCEPT - TWO TENANTS

M-2



MONUMENT SIGN CONCEPT - MULTIPLE TENANTS

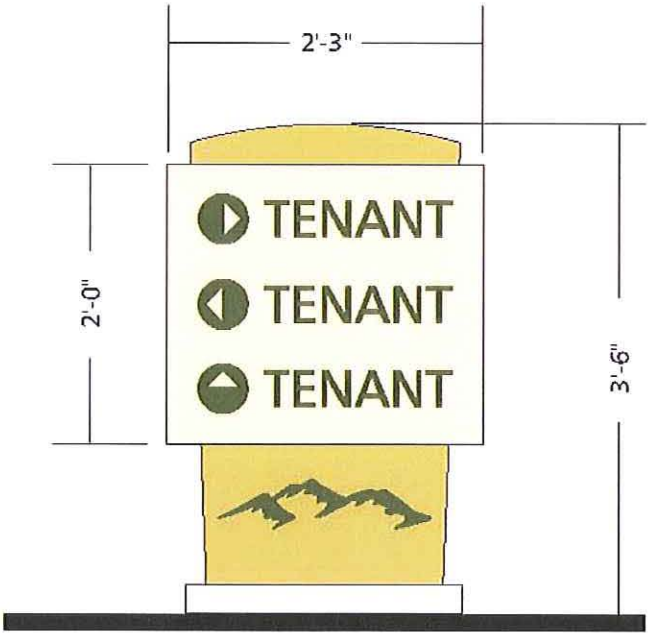
Tenant Monument Signs 4.7

Source: Signage Solutions

Pedestrian Directional Signs



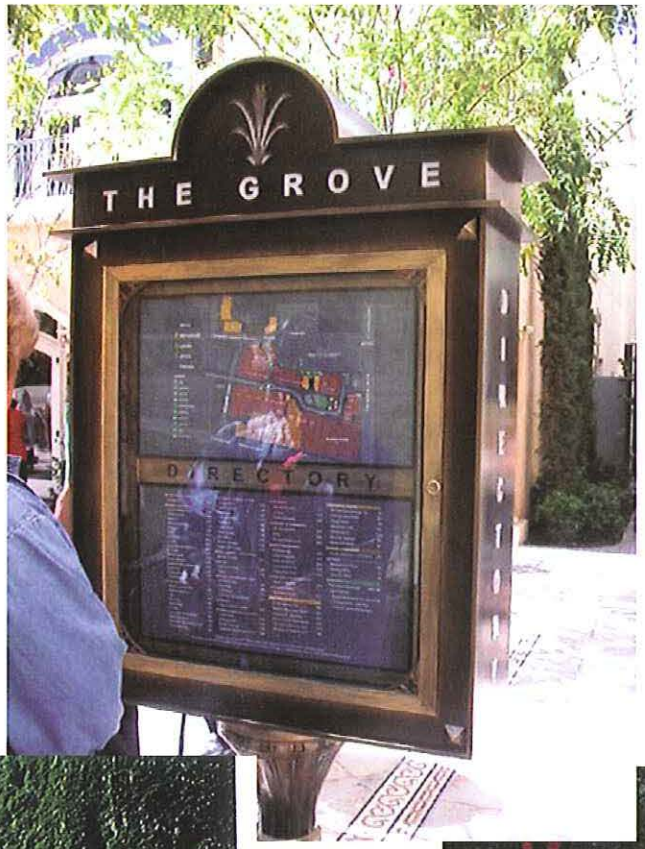




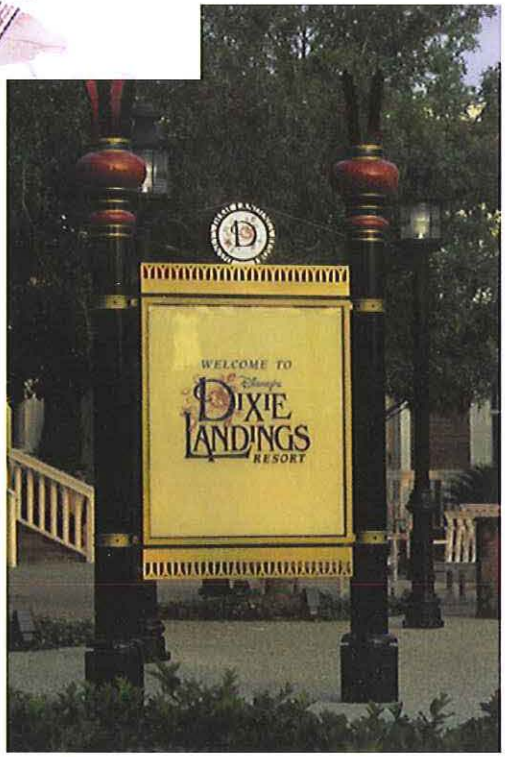
D

VEHICULAR DIRECTIONAL SIGN
Scale: 3/4"=1'-0"

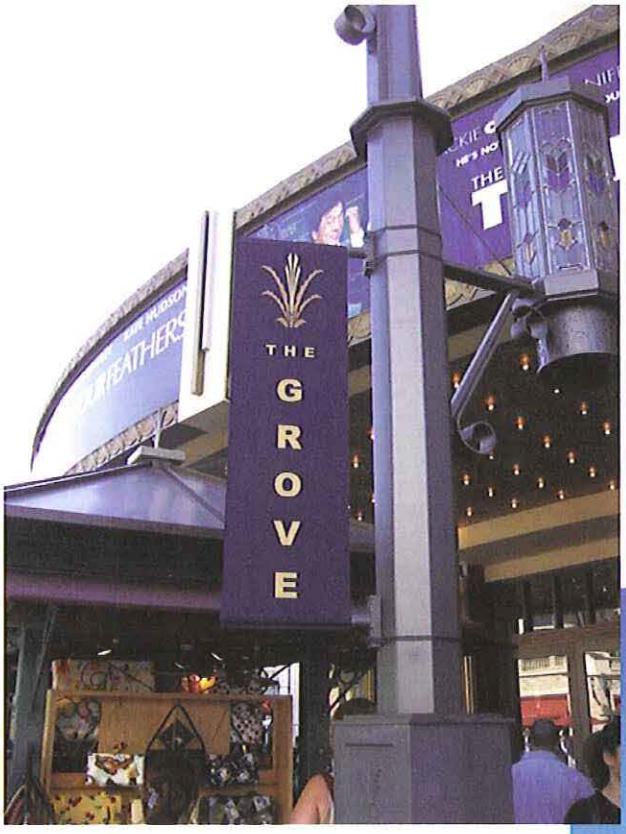
Directional Signs 4.8





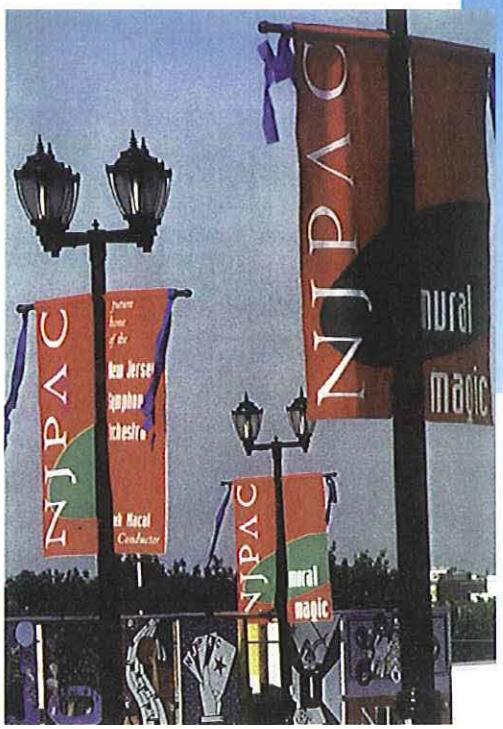


Project Directory Signs & Community Boards 4.9





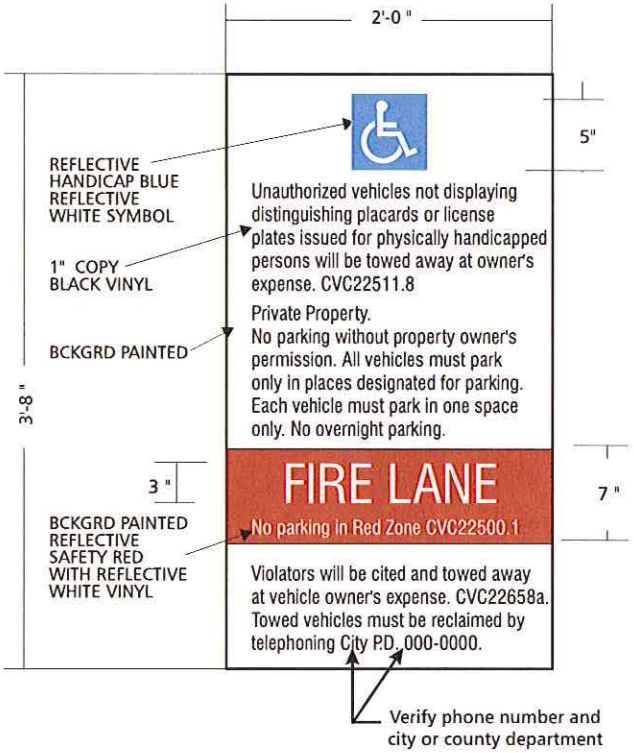


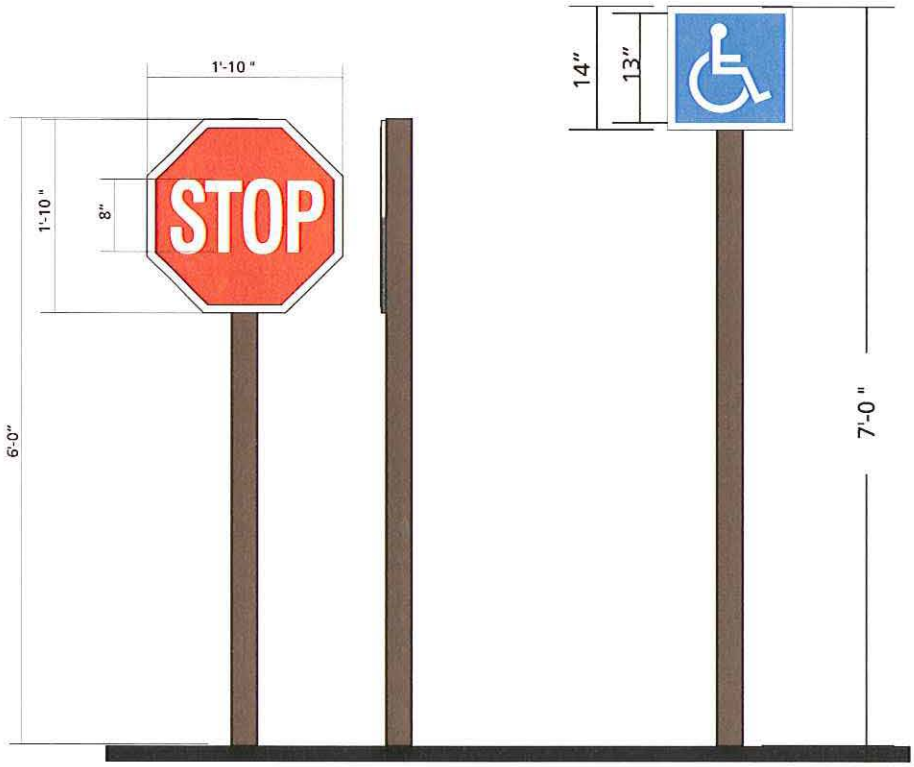


Site Pageantry 4.10



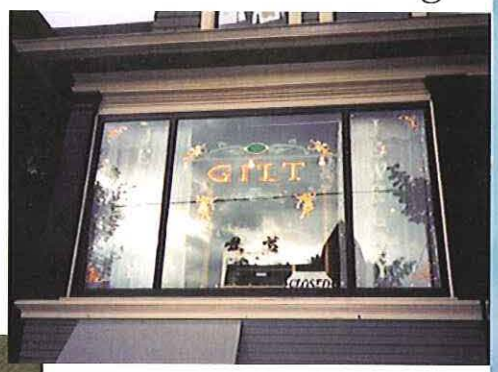
scale : 3/8" = 1'-0"

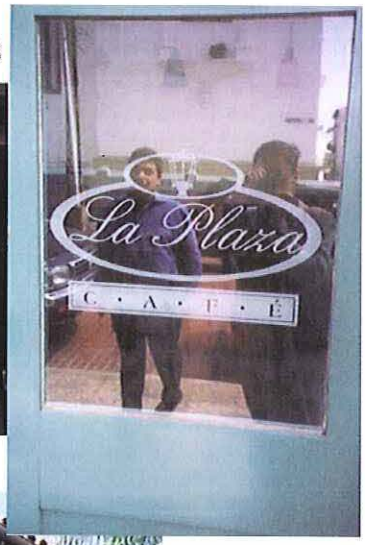




Regulatory Signage 4.11

Window Signs

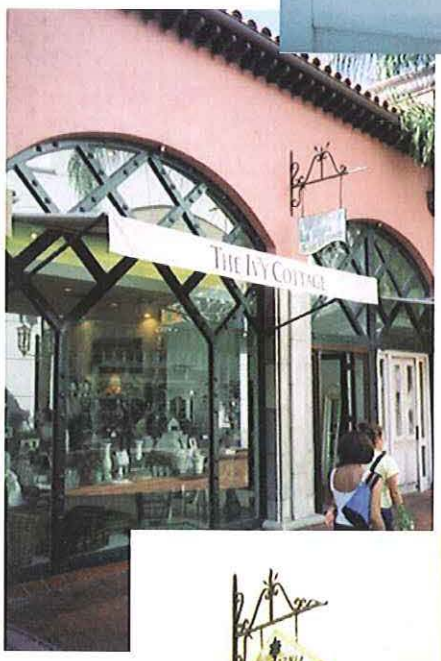






Blade Signs





Awing Signs



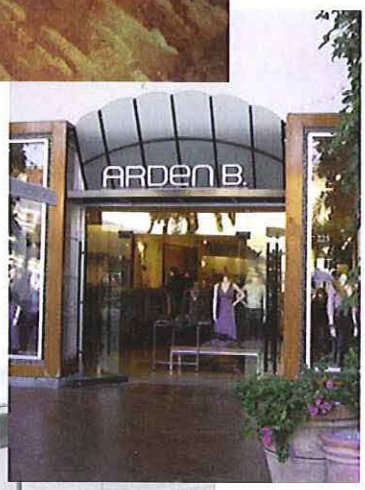


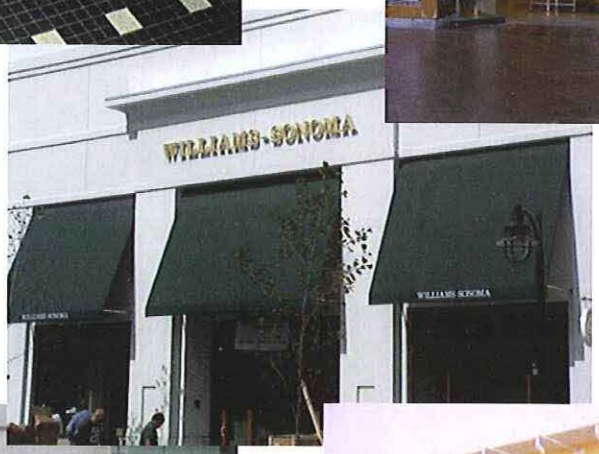
Tenant Identity Signage 4.12



Floor Graphics







Fascia Signs





Wall
Plaques



Tenant Identity Signage 4.13

4.10 LANDSCAPE GUIDELINES

4.10.1 Introduction

A Landscape Master Plan provides planting materials and locations to complement the building architecture, enhance the parking lot areas, and soften the effect of hardscapes and hard surfaces. Exhibit 4.14 provides the conceptual landscape plan for The Commons. The plant palette includes a variety of plant materials such as:

A. Parking Lot Trees

1. *Cinnamomum Camphora* Camphor Tree
2. *Tristania Conferta* Brisbane Box
3. *Magnolia Grandiflora* Southern Magnolia
4. *Lagerstoemia Indica* Crape Myrtle
5. *Ulmus Parvifolia* Elm Tree

B. Entry/Accent Trees

1. *Phoenix Dactylifera* Date Palm
2. *Washingtonia Filifera* California Fan Palm
3. *Washingtonia Robusta* Mexican Fan Palm

C. Screen Trees

1. *Brachychiton Populneus* Bottle Tree
2. *Cupressus Sempervirens "Glauca"* Glauca Italian Cypress
3. *Cupressus Arizonica* Arizona Cypress

D. Small Accent Trees

1. *Bauhinia Variegata* Orchid Tree
2. *Lagerstroemia Indica* Crape Myrtle
3. *Geijera Parviflora* Australian Willow

Substitution of the aforementioned list may be approved by the Community Development Director or designee.

Enhanced paving will generally be located along the storefront walkways, primary pedestrian crosswalks and at the main vehicular entrance to The Commons from Chino Hills Parkway. Enhanced paving may be any of the following materials, as approved by the Community Development Director or designee:

- Integral colored concrete with saw cut pattern including a sandblast or acid wash finish with a sealant;
- Patterned and colored asphalt like streetprint or equal

- Concrete interlocking paving units with contrasting accent bands with a sealant;
- Natural grey concrete with saw cut pattern including including a sandblast or acid wash finish with paver accents or borders with a sealant;
- Any combination of the above materials, pattern and finishes;

4.10.2 Street Trees

Trees in the public rights-of-way complement the unique character of each street. Street trees include:

A. Street Trees

Chino Hills Parkway

1. *Pyrus Calleryana Bradford* Evergreen Pear or Bradford Pear
2. *Koelreuteria Paniculata* Goldenrain Tree
3. *Platanus Acerifolia* London Plane Tree
4. *Brachychiton Populneus* Bottle Tree

B. Perimeter Trees

1. *Tipuana Tipu* Tipu Tree or Rosewood
2. *Liriodendrom Tulipifera* Yellow Poplar
3. *Brachychiton Populneus* Bottle Tree

Substitution of the aforementioned list may be approved by the Community Development Director or designee.



LANDSCAPE AREA TABULATIONS

TOTAL LANDSCAPE AREA = 297,394 S.F.
PERCENTAGE OF SITE LANDSCAPE AREA = 14%
PARKING LOT LANDSCAPE AREA = 97,306 S.F.
PERCENTAGE OF PARKING LOT LANDSCAPE AREA = 3%

BUILDING LEGEND - SITE PLAN

- MAJOR
- SHOP
- RESTAURANT/ FAST FOOD
- HOTEL
- BANK

Conceptual Landscape Plan 4.14

Not to scale
Source: KKE Architects

5. IMPLEMENTATION PLAN

The purpose of this section is to define the implementation measures necessary to carry out The Commons at Chino Hills Specific Plan.

5.1 PHASING

Phasing of the Specific Plan meets the following objectives:

- The orderly build-out of the mixed-use project based upon market and economic conditions.
- The provision of adequate infrastructure and public facilities concurrent with development of each phase.
- The protection of public health, safety and welfare.

It is envisioned that The Commons will be built in one phase with the timing of completion of perimeter restaurant pads dependent upon market activity.

5.2 FINANCING AND FEES

California Government Code Section 65451 sets forth the basic content of specific plans and one of the requirements is to include information relating to project financing and fees. Various techniques are available for financing the required infrastructure and project components and may include Community Facility District funds and Lighting District Funds and the General Fund.

5.2.1 Applicability

The development standards contained herein provide specific standards for land use development within the Specific Plan area. The Specific Plan supersedes the otherwise applicable City of Chino Hills development standards/regulations unless stated herein to the contrary. Whenever the provisions and development standards contained herein conflict with those contained in the City of Chino Hills Development Code, the provisions of the Specific Plan shall take precedence. Where the Specific Plan is silent, the City of Chino Hills Development Code shall apply.

5.2.2 Administration

The Commons at Chino Hills Specific Plan serves as the implementation tool for the General Plan as well as the zoning for the project site. The Specific Plan addresses general provisions, permitted uses, development standards and design guidelines.

5.2.3 Interpretation

To the extent there are conflicts between mitigation measures (imposed pursuant to the City's CEQA review), the Specific Plan, Conditions of Approval, or the City of Chino Hills Development Code, the following the order of precedence shall govern:

1. Mitigation Measures;
2. The Commons at Chino Hills Specific Plan;

3. Conditions of Approval; and

4. City of Chino Hills Development Code

5.2.4 Implementation

All development proposals within the Specific Plan are subject to the implementation procedures established herein.

5.2.5 Specific Plan Revisions

Revisions to the Specific Plan may be requested by the applicant or by the City at any time pursuant to Section 65453(a) of the State Government Code. Revisions are processed pursuant to the provisions of the Government Code for Specific Plan and the City of Chino Hills Development Code. In the event the proposed revisions require supplemental environmental analysis, pursuant to the California Environmental Quality Act (CEQA), the applicant is responsible for preparing the necessary CEQA documentation.

5.2.6 Minor Modifications

The following constitute Minor Modifications to the Specific Plan. They are subject to review and approval by the Community Development Director or designee. Minor Modifications do not require amendment to the Specific Plan. Minor modifications shall not result in an increase in density, increase in height, reduction in setback, decrease in parking ratios, or change of use in a manner that would be inconsistent with the requirement of the Specific Plan:

- Change in utility and/ public service provider;
- Minor changes to text and maps intended to clarify Specific Plan information, provided such changes do not add density or modify the development policies or standards of the Specific Plan;
- Minor changes to landscape materials, wall materials, entry design, streetscape design and signage which are consistent with the conceptual design set forth in the design guidelines contained with the Specific Plan provided that the substitute materials and designs approved are of the same of better quality;
- Minor changes to the design guidelines including architecture, design, and color palette, provided that the design is of the same or better quality;
- Minor changes to The Commons conceptual site plan, building dimensions, or architectural elevations as depicted in the Specific Plan necessary to accommodate proposed tenant improvements provided that such do not alter the general layout and building configurations of the conceptual site plan are in compliance with all of the restrictions set forth in Table 2-1, "Typical Tenant Roster" and Exhibit 2.1, Conceptual Site Plan;
- Other modifications of a similar nature to those listed above as determined by the Community Development Director or designee.

5.2.7 Appeals

All appeals pertaining to this Specific Plan shall be made to the Planning Commission. The applicant or any other entity shall have the right to appeal the decision of the Planning Commission on any determination by filing an application on forms provided by the City of Chino Hills within ten (10) business days following the final date of action for which an appeal is made. Appeals shall be processed consistent with the provisions of the City of Chino Hills Development Code.

5.2.8 Development Permits

All new development within the project site is subject to the Site Plan Review process as established in Section 16.78 of the City of Chino Hills Development Code. Subsequent development after initial approval is subject to a Site Development Permit or as determined by the Community Development Director. Adoption of the Specific Plan includes adoption of the design guidelines contained herein which provide direction for the design of the development projects within the project site.

5.2.9 Maps

Approval of maps may occur with or subsequent to the adoption of the Specific Plan creating parcels for development. The project may include parcel map(s), lot line adjustments and/or other minor subdivision actions.

5.3 GENERAL PLAN CONSISTENCY

California Government Code (Title 7, Division 1, Chapter 3, Article 8, Section 65450-65457) permits adoption and administration of specific plans as an implementation tool for elements contained in the local general plan. Specific plans must demonstrate consistency in regulations, guidelines and programs with the goals and policies set forth in the general plan.

The Commons at Chino Hills Specific Plan has been prepared in conformance with the goals and policies of the City of Chino Hills General Plan.

[This page intentionally left blank]

The Shoppes Specific Plan 6th Amendment (Proposed Changes)

The Shoppes Specific Plan amendment includes modifications to various sections to incorporate the Housing Element changes at the Shoppes retail, Shoppes II site (referenced as Shoppes Mixed Use originally), and the overflow parking for Community Park. As previously mentioned, the three sites will encompass a total of 1,061 multi-family units. Because the specific plan is nearly 20 years old (Exhibit “F”), the document cannot be produced in a redline version. Therefore, the changes to each amended section are detailed below and outlined in red.

- Page 3 – 1.3 Background and History

> *The Shoppes at Chino Hills (referred to herein as the "Shoppes Retail") provides up to 378,230 square feet of retail, office and restaurant space, plus a Mixed Use Housing (MUH) category that allows for up to 267 multifamily housing units in compliance with the City’s adopted 6th Cycle Housing Element (Housing Element).*
>
> *The Shoppes at Chino Hills Mixed Use (referred to herein as the "Shoppes Mixed/Use") establishes an Urban High Density Housing (UHDH) category that allows for an urban density development of up to 744 multifamily units in compliance with the Housing Element. Because of its connection to the Housing Element, the UHDH is the preferred development scenario, and would supersede the "Shoppes Mixed/Use" previous entitlement scenario which allows for up to 40,000 square feet of commercial, retail, restaurant and office space, up to 295 multifamily dwelling units, and up to 300 hotel rooms.*
>
> *The City Community Park (referred to herein as "Community Park") includes up to 43 acres of new park facilities and the Community Center (referred to herein as the "Community Center") includes a recreational community center and a Very High Density Housing (VHDH) category that allows for 50 multifamily senior housing units in compliance with the Housing Element. The five project components are described in detail in Section 2.0, Development Plan.*

- Page 12 – Table 1-1 General Plan and Zoning Designations

Project Component	General Plan Designation		Zoning Designation	
	Current	After Adoption of Specific Plan Amendment	Current	After Adoption of Specific Plan Amendment
Shoppes Retail	CommercialInstitutional Public Open Space	Commercial; Mixed Use Housing	Specific Plan 04-01Institutional Public (I-2)	Specific Plan 04-01
Civic Center	Institutional/Public FacilityRural Residential	Institutional/Public Facility	Specific Plan 04-01Rural Residential (R-R)	Specific Plan 04-01 / Civic Center
Shoppes Mixed-Use	Very High Density ResidentialRural Residential	Urban High Density Housing	Specific Plan 04-01Rural Residential (R-R)	Specific Plan 04-01
Community Park	Public ParkPublic Open Space Agriculture/Ranches Low Density Residential	Public Park; Very High Density Housing	Specific Plan 04-01Rural Residential (R-R) Low Density Residential (R-S) Planned Development (PD 24-125)	Specific Plan 04-01
Community Center	Public ParkAgriculture/Ranches	Public Park	Specific Plan 04-01Rural Residential (R-R)	Specific Plan 04-01

- Page 15 – 2.1 Land Use Plan

The Shoppes at Chino Hills Retail/Civic Center/Mixed-Use/Residential/Community Park Specific Plan includes proposed development consisting of up to 550,000 square feet of commercial, retail, office and restaurant development, up to 300 hotel rooms, a ~~new~~ civic center of up to 133,060 square feet, three residential development sites for a total of up to ~~295~~ 1,061 dwelling units, community park facilities and a 19,000 square foot recreational community center. The total area of the Specific Plan is approximately 100 acres.

Shoppes Retail: The Shoppes Retail district implements the Shoppes Retail component of the Specific Plan. This designation allows for a mix of retail, commercial, entertainment, restaurant and office uses that will allow for the creation of a central core with an active street life and a vibrant retail and business center. A mixed use residential component is also allowed. The Shoppes Retail district also includes a freeway pylon sign, to be located along State Route 71 (Chino Valley Freeway) in the City of Chino Hills on Grand Avenue.

Shoppes Mixed-Use: The Shoppes Mixed-Use district provides for an urban high density housing development. ~~mix of uses including higher density residential development in the form of townhomes, apartments and condominiums.~~ Office, commercial, retail, restaurant, hotel, on-site parking and structured parking are also permitted.

Community Park: The Community Park includes public recreational facilities as well as passive open space. A very high density senior housing component is also allowed at the southwest corner of Peyton Drive and Eucalyptus Avenue.

- Page 19 – Table 2-1 Shoppes Retail

Department Store or Major Anchor	100,000 sq. ft. minimum for Department Store; or a minimum of two major retailers, each at a minimum of 20,000 sq. ft. and subject to City Manager or designee approval.	
Retail	40,000 sq. ft. individual retailer maximum per	
Restaurant	Up to 60,000 sq. ft.	
Offices	Up to 65,000 sq. ft.	
Entertainment	Up to 10,000 sq. ft.	
Mixed Use Housing (MUH)	Up to 267 units	
Total Commercial Building Area*		Up to 378,230 sq. ft.
Shoppes Retail Site Area		26.2 Acres
*Building Area calculation is exclusive of residential building area		

- Page 20 – 2.1.3 Shoppes Mixed Use and Table 2-3

The Shoppes Mixed-Use land use designation is part of the Mixed-Use district that allows for an urban high density residential development, or a mixed residential and commercial development. The very high density housing scenario (Urban High Density Housing/UHDH) allows for an urban density of development of up to 744 multifamily units in compliance with the Housing Element of the Chino Hills General Plan. Because of its connection to the Housing Element, the UHDH is the preferred development scenario. The mixed use scenario allows up to 40,000 square feet of commercial, retail, restaurant and office space, and up to 300 hotel rooms. A multi-level parking structure is included to accommodate parking for the residential, retail, office and/or hotel components. ~~and of the Shoppes Mixed Use development and may be for private use only.~~ Other uses consistent with the Shoppes Mixed-Use district may be permitted. Refer to Exhibit 2-2 for a conceptual site plan of Shoppes Mixed-Use. Proposed site, building area and density for the mixed-use component is provided in Table 2- 3.

Urban High Density Housing (UDHD)	Up to 744 units	
Commercial/Retail/Restaurant /Office	Up to 40,000 sq. ft	
~~Multi-Family Residential~~	~~Up to 235 units~~	
Hotel(s)	Up to 300 rooms	
Shoppes Mixed-Use Site Area		8 Acres

- Page 21 – 2.1.4 Community Park

The proposed layout for the Community Park is illustrated in Exhibit 2-3, Community Park Conceptual Site Plan. The recreational facilities at the Community Park site, at a minimum, replace those facilities operating at the Chino Hills Community Park prior to Specific Plan adoption. The relocated park includes a tot lot, picnic areas, fields to handle baseball, softball, soccer and other seasonal recreational activities, along with restroom facilities, a snack bar and associated spectator seating and parking areas. Additional accessory uses for the Community Park may include outdoor basketball courts, a community center building and new multi-purpose trail. Site, building area and a list of possible amenities for Community Park uses are contained in Table 2-4. A Very High Density Housing (VHDH) component, which allows for 50 multifamily senior housing units in compliance with the Housing Element on an approximately 2.4 acre site at the southwest corner of Peyton Drive and Eucalyptus Avenue, is also permitted.

Ball Fields	6	
Soccer Overlays	5	
Restroom/Concession Buildings	1,600 sq. ft.	
Maintenance/Storage Building	1,400 sq. ft.	
Maintenance Building;	+2,500 sq. ft.	
Maintenance Yard	+2,500 sq. ft.	
Tot Lot	2,700 sq. ft.	
Bullpen Areas	12	
Soft Toss Areas	12	
Picnic Tables	12	
Group Picnic Areas	2	
Multi Use Trails	+3,000 linear ft.	
Very High Density Housing (VHDH)	50 units	
Community Park Site Area		43.0 Acres

- Page 52 – *3.2.2 Shoppes Mixed Use Housing: Designation and Purpose (new section)*

The purpose of the Shoppes Mixed Use Housing land use designation is to implement the goals and policies of the General Plan 6th Cycle Housing Element by facilitating development of housing at very high densities to accommodate the City's Regional Housing Needs Allocation (RHNA) allocation of "lower income" households, consistent with Government Code Section 65583.

The Shoppes Mixed Use Housing land use designation creates an area where very high density housing is incorporated in the Shoppes Retail fabric. Very high density residential units may be located above or adjacent to commercial buildings and

uses, but existing commercial area shall be preserved, with a minimal (5% or less) amount of displacement.

- Page 54-55 – 3.2.4 Shoppes Mixed Use Housing: Permitted Uses and Table 3-1 Shoppes Retail/Mixed Use Housing Development Standards

Permitted uses in the Shoppes Mixed Use Housing district include very high density multifamily, consisting of 267 units, and Shoppes Retail permitted uses, as identified in section 3.2, above.

Development Standard	Shoppes Retail
A. Minimum Lot Size, GLA [1]	5,000 sf
B. Minimum Lot Dimensions ♦ Width ♦ Depth	 50' ft 50' ft
C. Maximum Height ♦ Retail ♦ Mixed Use Housing Housing	50' ft. to roofline; 80' ft. to architectural feature. 80 ft.
D. Landscaping Required	Minimum 10% of the Shoppes Retail designation must be landscaped (may include planted areas &: enhanced hardscape)
E. Parking Lot Landscaping	Minimum 2% of parking areas (exclusive of loading areas) must be landscaped. This landscaping may be counted toward the total site area landscaping required in item D above.
F. Maximum Floor Area Ratio (FAR)	No maximum floor area ratio.
G. Minimum Street Side Building Setbacks [2] ♦ Setback from Grand Avenue ♦ Setback from Peyton Road ♦ Setback from Boys Republic Drive ♦ All other setbacks	 15' ft. 15' ft. 5' ft. 0' ft.
H. Minimum Internal Street -Side Building Setbacks[2]	0' ft.

Mixed Use Housing development shall be regulated according to the standards in Section 16.05 – Objective Design Standards and 16.15 – Housing Priority Zoning Districts of the Chino Hills Municipal Code.

- Page 61 – Table 3-3 Shoppes Retail/*Mixed Use Housing* Parking Requirements

Use	Required Number of Spaces
Retail/Commercial/Entertainment/Office/Restaurant Mix	Minimum 3.25 spaces/1000 SF, GLA[1]
Mixed Use Housing	Refer to Chapter 16.15 Housing Priority Zoning Districts parking requirements

- Page 77 – Table 3-6 Shoppes Mixed Use/*Urban High Density Housing* Development Standards

Development Standard	Shoppes Mixed Use		
A. Minimum Project Area	~~5,000 sf~~8 acres		
B. Minimum Lot Width	None Required		
C. Minimum Lot Depth	None Required		
D. Maximum Floor Area Ratio[1]:			
♦ Commercial/Retail/Office	2.00		
♦ Hotel(s)	1.75		
♦ Residential	2.25		
E. Maximum Density/Intensity:			
♦ Commerdal/Retail/Office[2]	40,000 sf		
♦ Hotel(s)	300rooms		
♦ Residential	Up to 744~~235~~ du[3]		
F. Maximum Building Height't			
♦ Commercial/Retail/Office[5]	50' ft. to roofline; 80' ft. to architectural feature		
♦ Hotel(s)	80' ft to roofline; 85' ft to architectural feature		
♦ Residential/Mixed Use Buildings[6]	80' ft to roofline; 85' ft to architectural feature~~70' ft. to roofline; 80' ft to architectural feature~~		
G. Minimum Street-Side Building Setbacksr:	Front	Side	Rear
♦ Boys Republic Drive	10' ft	10' ft	n/a
♦ City Center Drive	10' ft	10' ft	n/a
♦ Shoppes Drive	10' ft	10' ft	n/a
♦ Other Private Streets/Driveway[8]	10' ft	10' ft	5' ft

- Page 79 – 4.3.3.3 – Shoppes Mixed Use: Residential

  Development of the Shoppes Mixed Use site shall be in conformance with Chapter 16.05 – Objective Design Standards and Chapter 16.15 – Housing Priority Zoning Districts of the Chino Hills Municipal Code.

- Page 82 – Table 3-7 Shoppes Mixed Use/*Urban High Density Housing* Parking Requirements

Use	Number of Spaces Required	Number of Unassigned Guest Spaces
Hotel		
• HotelRoom	1 space per hotel room[1]	*NIA*
• Meeting Space/Dining	Minimum 3.25 spaces/ 1000 SF,GLA[2]	*NIA*
Commercial/Retail/Restaurant/Office	Minimum 3.25 spaces/ 1000 SF,GLA[2]	*NIA*
Residential: ~~Condominium and~~ MultiFamily	Refer to Chapter 16.15 Housing Priority District for parking requirements	
~~• Studio (10 units or less)~~	~~1.01.0~~	~~.25perunit~~
~~11 Studio (For each additional unit above 10 units)~~	~~1.25~~	~~.25 per unit~~
~~• 1Bedroom~~	~~1.5~~	~~.25 per unit~~
~~• 2 Bedroom~~	~~2.0~~	~~.25perunit~~
~~11 3 Bedroom~~	~~2.0~~	~~.25perunit~~

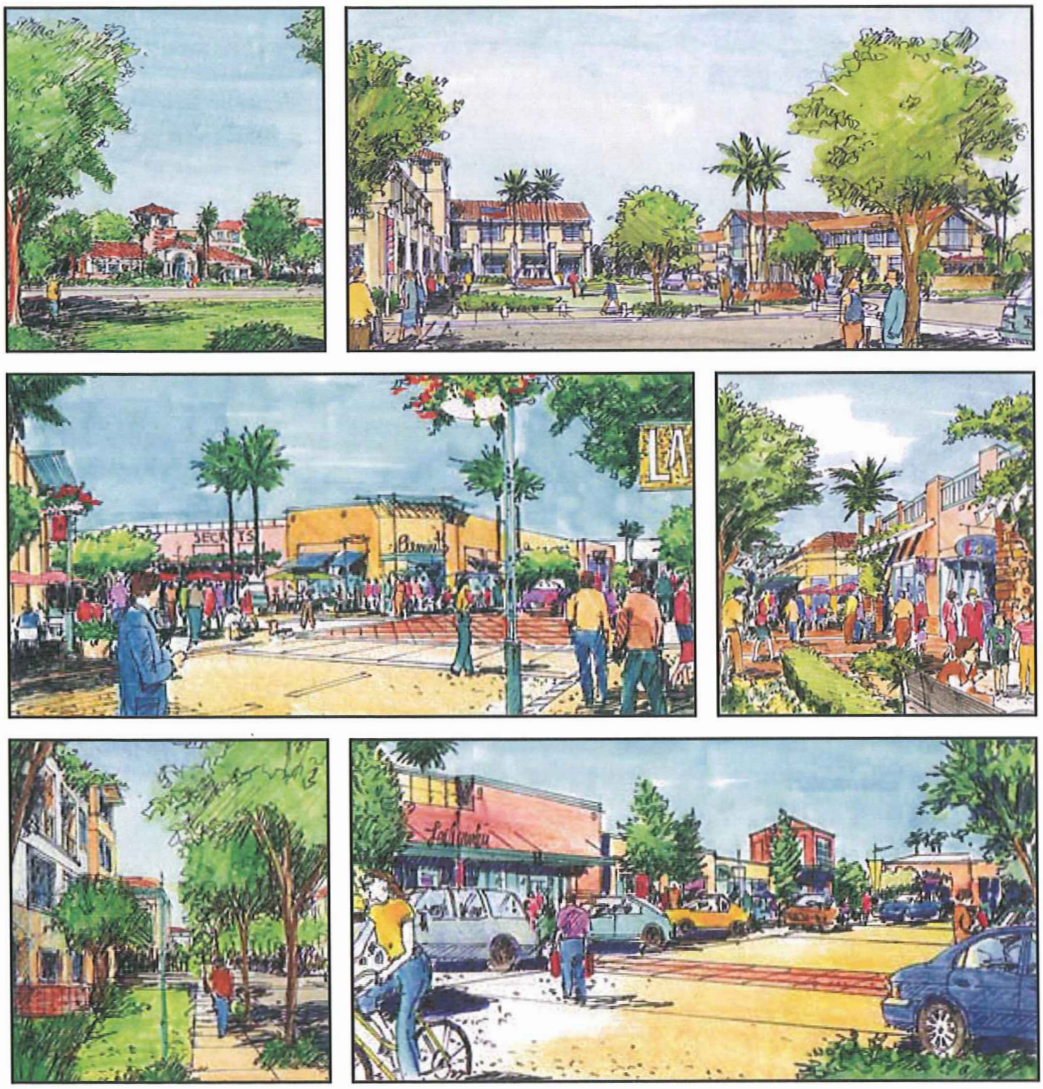
- Page 110 – Design Guidelines - Design Goals

The designs of streetscapes, buildings, and landscaping within the Shoppes Retail, Civic Center, and Shoppes Mixed-Use reinforce the traditional downtown atmosphere and provide a vibrant, urban setting for those living, dining, working, relaxing, and shopping at the project. The development is a pedestrian-scaled venue of refined architectural expression rendered in high quality materials and finishes. The design guidelines in this section identify components important to the creation of this environment. In addition, Chapter 16.05 Objective Design Standards shall apply for Mixed Use Housing, Very High Density Housing, and Urban High Density Housing.

Exhibit "F"

The Shoppes at Chino Hills Specific Plan

Retail • Civic Center • Mixed Use • Residential • Community Park



City of Chino Hills

THE SHOPPES AT CHINO HILLS SPECIFIC PLAN

RETAIL • CIVIC CENTER • MIXED-USE • RESIDENTIAL • COMMUNITY PARK

ADOPTED - OCTOBER 11, 2005

(AMENDED - MAY 18, 2006)

(AMENDED – JANUARY 23, 2007)

(AMENDED – NOVEMBER 25, 2008)

(AMENDED – SEPTEMBER 11, 2012)

(AMENDED - APRIL 27, 2021)

Prepared for:

City of Chino Hills
Community Development Department
2001 Grand Avenue
Chino Hills, CA 91709
909.364.2742

Contact: Joann Lombardo, Project Planner

Submitted by:

Opus West Corporation
2050 Main Street, #800
Irvine, CA 92614
949.622.3452

Contact: Jeff Hill, Vice President Real Estate Development

Prepared by:

Hogle-Ireland, Inc.
2860 Michelle Drive, Ste. 100
Irvine, CA 92606
949.553.1427

Contact: Alexa Wyneken, Project Manager

[This page intentionally left blank]

TABLE OF CONTENTS

1 Introduction 1
1.1 Specific Plan Purpose 1
1.2 Authority for the Specific Plan 2
1.3 Background and History 2
1.4 Project Location 3
1.5 Project Setting 11
1.5.1 On-Site Land Uses 11
1.5.2 Surrounding Land Uses 11
1.5.3 General Plan and Zoning Designations 11
1.6 Objectives for Development of the Specific Plan 12
2 Development Plan 15
2.1 Land Use Plan 15
2.1.1 Shoppes Retail 19
2.1.2 Civic Center 20
2.1.3 Shoppes Mixed-Use 20
2.1.4 Community Park 21
2.1.5 Community Center 22
2.2 Traffic and Circulation 29
2.2.1 Shoppes Retail, Civic Center and Shoppes Mixed-Use Site 29
2.2.2 Community Center Site 43
2.2.3 Community Park Site 43
2.3 Infrastructure 45
2.3.1 Water 45
2.3.2 Wastewater (Sewer) 45
2.3.3 Storm Drainage 46
2.3.4 Solid Waste 47
2.3.5 Utilities 47
2.4 Public Facilities and Services 47
2.4.1 Public Safety 47
2.4.2 Public Transportation 48
3 Development Standards 51
3.1 General Purpose 51
3.1.2 Resolution of Issues 51
3.2 Shoppes Retail: Regulations for Development 52
3.2.1 Shoppes Retail: Designation Intent and Purpose 52
3.2.2 Shoppes Retail: Permitted Uses 52
3.2.3 Shoppes Retail: Development Standards 54
3.2.4 Shoppes Retail: Landscaping and Lighting 63
3.2.5 Shoppes Retail: Architecture and Design 65
3.3 Civic Center Regulations for Development 71
3.3.1 Civic Center: Designation Intent and Purpose 71
3.3.2 Civic Center: Permitted Uses 71
3.3.3 Civic Center: Development Standards 71

3.4 Shoppes Mixed-Use Regulations for Development....75
3.4.1 Shoppes Mixed-Use: Designation Intent and Purpose....75
3.4.2 Shoppes Mixed-Use: Permitted Uses....75
3.4.3 Shoppes Mixed-Use: Development Standards....77
C. Parking Facility Development Standards:....82
3.4.4 Shoppes Mixed-Use: Architecture and Design....84
3.4.5 Shoppes Mixed-Use: Landscaping and Lighting....84
3.4.6 Shoppes Mixed-Use: Signs....86
3.4.7 Additional Standards....86
3.5 Community Center Regulations for Development....103
3.5.1 Community Center: Designation Intent and Purpose....103
3.5.2 Community Center: Permitted Uses....103
3.5.3 Community Center: Development Standards....103
3.6 Community Park Regulations for Development....107
3.6.1 Community Park: Designation Intent and Purpose....107
3.6.2 Community Park: Permitted Uses....107
3.6.3 Community Park: Development Standards....107
4 Design Guidelines....111
4.1 Design Goals....111
4.2 Design Context....111
4.2.1 Shoppes Retail....111
4.2.2 Civic Center....112
4.2.3 Shoppes Mixed-Use....112
4.2.4 Community Center....112
4.3 Building Form and Character....112
4.4 Entryways....118
4.5 Pedestrian Walkways....118
4.6 Outdoor Public Spaces....118
4.7 Private Spaces....118
4.8 Pedestrian Amenities....124
4.9 Site Lighting....125
4.10 Exterior Building Materials....125
4.11 Landscaping / Hardscaping....132
4.12 Street Trees....133
4.13 Signs....136
4.13.1 Wayfinding Signs....136
4.13.2 Pylon / Reader Board....136
4.13.3 Major Site Identity Monuments....136
4.13.4 Project Gateways and Identity....136
4.13.5 Vehicular Scaled Directional Signs....137
4.13.6 Pedestrian Scaled Directional Signs....137
4.13.7 Project Directory Signs and Community Board....137
4.13.8 Site Pageantry....137
4.13.9 Regulatory Signage....154
4.13.10 Tenant Identity Signage....154
4.13.11 Prohibited Signage....155
5 Implementation Plan....162

5.1 Phasing 162
5.2 Financing and Fees 162
5.3 General Provisions 163
5.3.1 Applicability 163
5.3.2 Administration 163
5.3.3 Interpretation 163
5.3.4 Implementation 163
5.3.5 Specific Plan Revisions 163
5.3.6 Minor Modifications 164
5.3.7 Appeals 164
5.3.8 Site Development Permits 165
5.3.9 Maps 165
5.3.10 Development Agreement 165
5.4 General Plan Consistency 165

LIST OF EXHIBITS

Exhibit 1-1: Regional Vicinity Map 5
Exhibit 1-2: Vicinity Map 7
Exhibit 1-3: Aerial Photograph 9
Exhibit 2-1: Land Use Districts 17
Exhibit 2-2: Shoppes Retail, Civic Center and Shoppes Mixed-Use Conceptual Site Plan 23
Exhibit 2-3: Community Park Conceptual Site Plan 25
Exhibit 2-4: Community Center Conceptual Site Plan 27
Exhibit 2-5: Shoppes Retail, Civic Center and Shoppes Mixed-Use Conceptual Circulation Plan 33
Exhibit 2-6: Boys Republic Drive Conceptual Street Section 35
Exhibit 2-7: City Center Drive Conceptual Street Section 37
Exhibit 2-8: Main Street (East) Conceptual Street Section 39
Exhibit 2-9: Main Street (West) Conceptual Street Section 41
Exhibit 2-10: Shoppes Retail, Civic Center & Shoppes Mixed-Use Conceptual Infrastructure Plan 49
Exhibit 3-1: Line of Sight Triangle 57
Exhibit 3-2: Shoppes Retail Conceptual Site Plan 67
Exhibit 3-3: Shoppes Retail Conceptual Elevations 69
Exhibit 3-4: Shoppes Mixed-Use Conceptual Site Plan 87
Exhibit 3-5: Shoppes Mixed-Use Conceptual Elevations 89
Exhibit 3-6: Shoppes Mixed-Use Elevation and Building Design Examples 91
Exhibit 3-7: The Shoppes Mixed-Use Visual Study "A" 93
Exhibit 3-8: The Shoppes Mixed-Use Visual Study "B" 95
Exhibit 3-9: The Shoppes Mixed-Use Visual Study "C" 97
Exhibit 3-10: The Shoppes Mixed-Use Visual Study "D" 99
Exhibit 3-11: Examples of Residential Balconies 101
Exhibit 3-12: Community Center Conceptual Site Plan 105
Exhibit 3-16: Community Park Conceptual Site Plan 109
Exhibit 4-1: Building Design Examples 114
Exhibit 4-2: Examples of Canopies & Sunshades 116
Exhibit 4-3: Examples of Corner & Entry Features 120
Exhibit 4-4: Outdoor Public Space Examples 122
Exhibit 4-5: Pedestrian Amenities Examples 126
Exhibit 4-6: Pedestrian Amenities Examples 128
Exhibit 4-7: Lighting Examples 130
Exhibit 4-8: Shoppes Retail Conceptual Landscape Plan 134
Exhibit 4-9: Shoppes Retail Conceptual Sign Locations 138
Exhibit 4-10: Pylon / Reader Board Examples 140
Exhibit 4-11: Pylon / Reader Board Example 142
Exhibit 4-12: Pylon / Reader Board Conceptual Location 144

Exhibit 4-13: Major Site Identity Monuments, Project Gateways and Identity Signs....146
Exhibit 4-14: Vehicle and Pedestrian Scaled Directional Signs....148
Exhibit 4-15: Project Directory Signs and Community Board....150
Exhibit 4-16: Site Pageantry....152
Exhibit 4-17: Regulatory Signage....156
Exhibit 4-18: Tenant Identity Signage....158
Exhibit 4-19: Tenant Identity Signage....160
Exhibit 5-1: Project Review and Approval Process Chart....166

LIST OF TABLES

Table 1-1: General Plan and Zoning Designations....12
Table 2-1: Shoppes Retail....19
Table 2-2: Civic Center....20
Table 2-3: Shoppes Mixed-Use....20
Table 2-4: Community Park Uses & Amenities....21
Table 2-5: Community Center....22
Table 3-1: Shoppes Retail: Development Standards....54
Table 3-2: Shoppes Retail: Maximum Projections into Street-Side Building Setback Areas[1]....55
Table 3-3: Shoppes Retail Parking Requirements....61
Table 3-4: Civic Center Development Standards....71
Table 3-5: Civic Center Parking Requirements....73
Table 3-6: Shoppes Mixed-Use Development Standards....77
Table 3-7: Shoppes Mixed-Use Parking Requirements....81
Table 3-9: Community Center Parking Requirements....103

[This page intentionally left blank]

1 INTRODUCTION

1.1 SPECIFIC PLAN PURPOSE

"The Shoppes at Chino Hills Retail/Civic Center/Mixed-Use/Residential/Community Park Specific Plan" (Specific Plan) provides a land use plan, design guidelines, and development regulations for a mixed-use project that includes a new commercial Lifestyle Center, civic center campus and multi-family residential units. The Specific Plan also provides for construction of a new community park to replace the existing park which is currently on the site. The Specific Plan defines the uses that are permitted and their locations, as well as the sizes and design of buildings and related improvements on each of the sites. In addition, the Specific Plan sets forth use and building development standards for the project which define and implement the Land Use Districts and Designations and constitutes the zoning for the project site.

Tentative, final and parcel map(s) or Development Plans (Site Plans, etc.) may be prepared and submitted to the City pursuant to the applicable provisions of the State of California Subdivision Map Act (Government Code Sections 66410 through 66499), the City of Chino Hills Subdivision Ordinance, the City of Chino Hills Development Code and consistent with the applicable provisions contained within the Shoppes at Chino Hills Retail/Civic Center/Residential/Community Park Specific Plan. The Development Plans will be submitted for City review prior to development of the project site.

The purpose of the Specific Plan is:

1. To implement the goals and policies of the General Plan of the City of Chino Hills through more detailed, site-specific standards that provide direction for development;

2. To establish new zoning designations for the planning area that recognize its unique place in the Chino Hills community;

3. To establish development standards and design principles for the planning area; and

4. To serve as a guideline for the amenities provided and the quality of development within the Specific Plan area.

1.2 AUTHORITY FOR THE SPECIFIC PLAN

Section 65450 et seq. of the Government Code sets forth basic requirements and provisions for specific plans. The Government Code specifically states:

> *"After the legislative body has adopted a general plan, the planning agency may, or if so directed by the legislative body, shall prepare specific plans for the systematic implementation of the general plan for all or part of the area covered by the general plan."*

Section 65451 of the Government Code requires that specific plans include text and a diagram or diagrams that specify all of the following:

- The distribution, location and the extent of the uses of land, including open space within the area covered by the plan;
- The proposed distribution, location, and extent and intensity of major components of public and private transportation, sewage, water, drainage, solid waste disposal, energy, and other essential facilities proposed to be located within the area covered by the plan and needed to support the land uses described in the plan;
- Standards and criteria by which development will proceed, and standards for the conservation, development, and utilization of natural resources, where applicable;
- A program of implementation measures including regulations, programs, public works projects, and financing measures necessary to carry out the project;
- A statement of the relationship of the specific plan to the general plan.

The Shoppes at Chino Hills Retail /Civic Center/Mixed-Use/Residential/Community Park Specific Plan is designed to meet the requirements of the State of California Government Code and the City of Chino Hills General Plan. The Specific Plan is adopted by resolution and thereby establishes the zoning regulations for the development of the project site.

1.3 BACKGROUND AND HISTORY

The project is being undertaken as part of an ongoing effort to address the City's long-term objectives, including expanding the City's economic base, establishing a permanent civic center, and meeting current and future public facility and park needs.

The City has been involved in the planning process for the project, including active public involvement, since 1999. The City Council subsequently directed staff to proceed with further refinement of the proposed project concept, formerly referred to as the Chino Hills Town Center project and to develop more precise concept plans for consideration and implementation.

The current project consists of six land use districts: Shoppes Retail, Sheriff/Police, Civic Center, Shoppes Mixed-Use, Community Park and Park Residential. Within these six land use districts, five primary zoning designations are proposed:

- The Shoppes at Chino Hills Lifestyle Center (Shoppes Retail)
- Civic Center (Civic Center)
- The Shoppes at Chino Hills Mixed-Use (Shoppes Mixed-Use)
- City Community Park (Community Park)
- Community Center (Community Center)

The Shoppes at Chino Hills (referred to herein as the "Shoppes Retail") provides up to 378,230 square feet of retail, office and restaurant space. The Civic Center (referred to herein as the "Civic Center") includes up to 133,060 square feet of public institutional uses. The Shoppes at Chino Hills Mixed Use (referred to herein as the "Shoppes Mixed-Use") allows for up to 40,000 square feet of commercial, retail, restaurant and office space, up to 295 multi- family dwelling units and up to 300 hotel rooms. The City Community Park (referred to herein as "Community Park") includes up to 43 acres of new park facilities and the Community Center (referred to herein as the "Community Center") includes a 19,000 square foot recreational community center. The five project components are described in detail in Section 2.0, *Development Plan*.

1.4 PROJECT LOCATION

The Shoppes at Chino Hills Retail/Civic Center/Mixed-Use/Residential/Community Park Specific Plan Project Area is located in the City of Chino Hills, California. The City of Chino Hills is located in southwestern San Bernardino County, and is uniquely situated adjacent to the boundaries of Los Angeles, Orange, and Riverside Counties. Exhibit 1-1, Regional Vicinity Map, provides the location of the Specific Plan area in its regional context.

Locations of project component sites are as follows:

- Shoppes Retail Southeast corner of the Peyton Drive/Grand Avenue intersection. The Shoppes Retail component also includes a freeway pylon sign, to be located along the Chino Valley Freeway (SR-71) in the City of Chino Hills either south of Grand Avenue on private property or within the Grand Avenue right-of-way.[1]

- Civic Center: On the east side of Peyton Drive (between Payne Ranch Road and English Springs Road) and south of the Shoppes Retail.

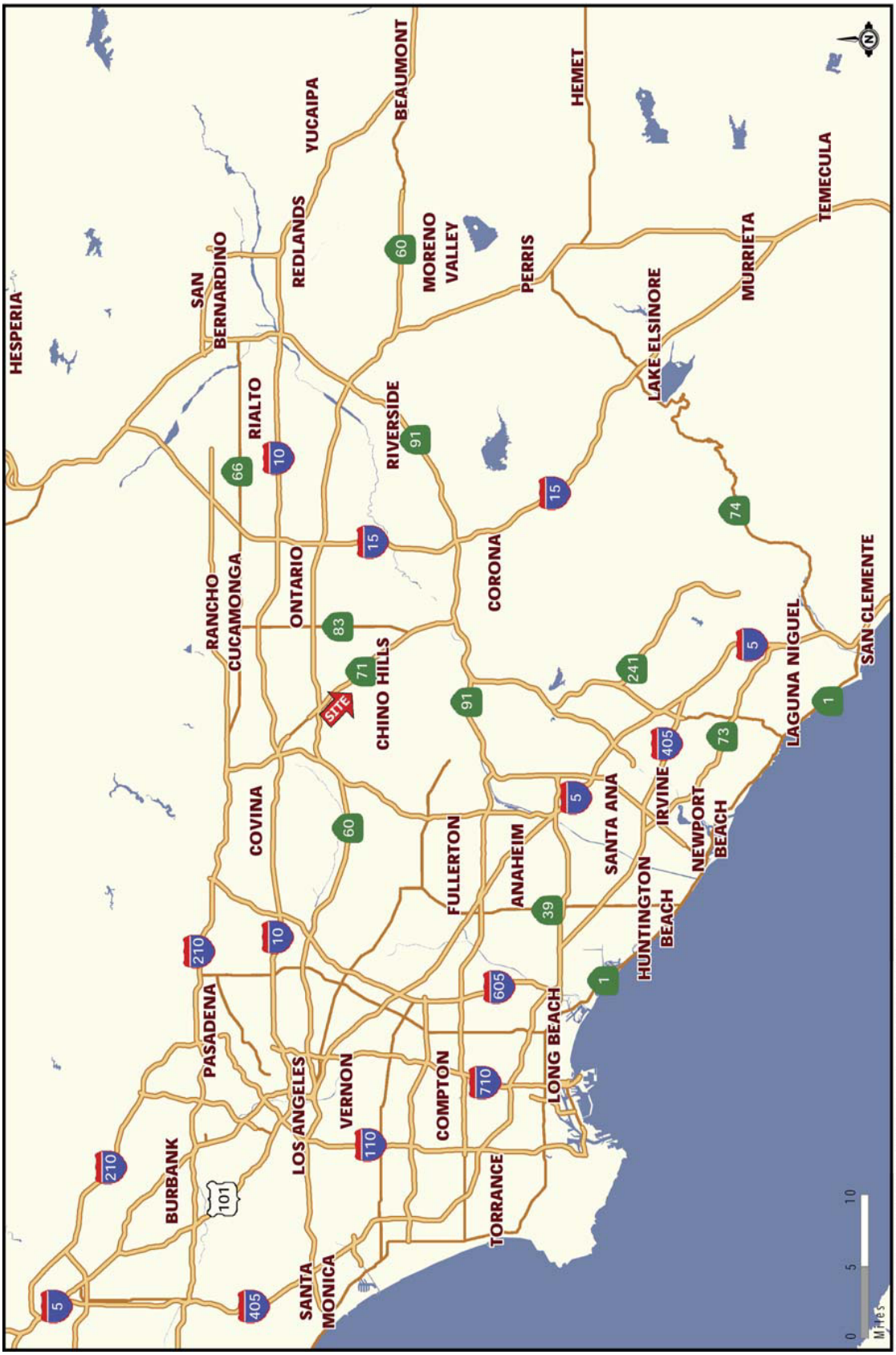
- Shoppes Mixed-Use: East side of Peyton Drive, south of the Shoppes Retail.

- Community Center: Northwestern corner of Peyton Drive and Eucalyptus Avenue intersection and west of Peyton Drive.

- Community Park: West side of Peyton Drive on the northwestern and southwestern corner of the Peyton Drive/Eucalyptus Avenue intersection.

Primary local access to the Shoppes Retail, Civic Center, and Shoppes Mixed-Use site is provided from Grand Avenue and Peyton Drive. Access to the Community Park/Community Center site is provided from Eucalyptus Avenue and Peyton Drive. Exhibit 1-2, Vicinity Map, provides locations of the planning areas and the roadways in the project vicinity. Exhibit 1-3, Aerial Photograph, provides an aerial photograph depicting the existing conditions of the Project Site.

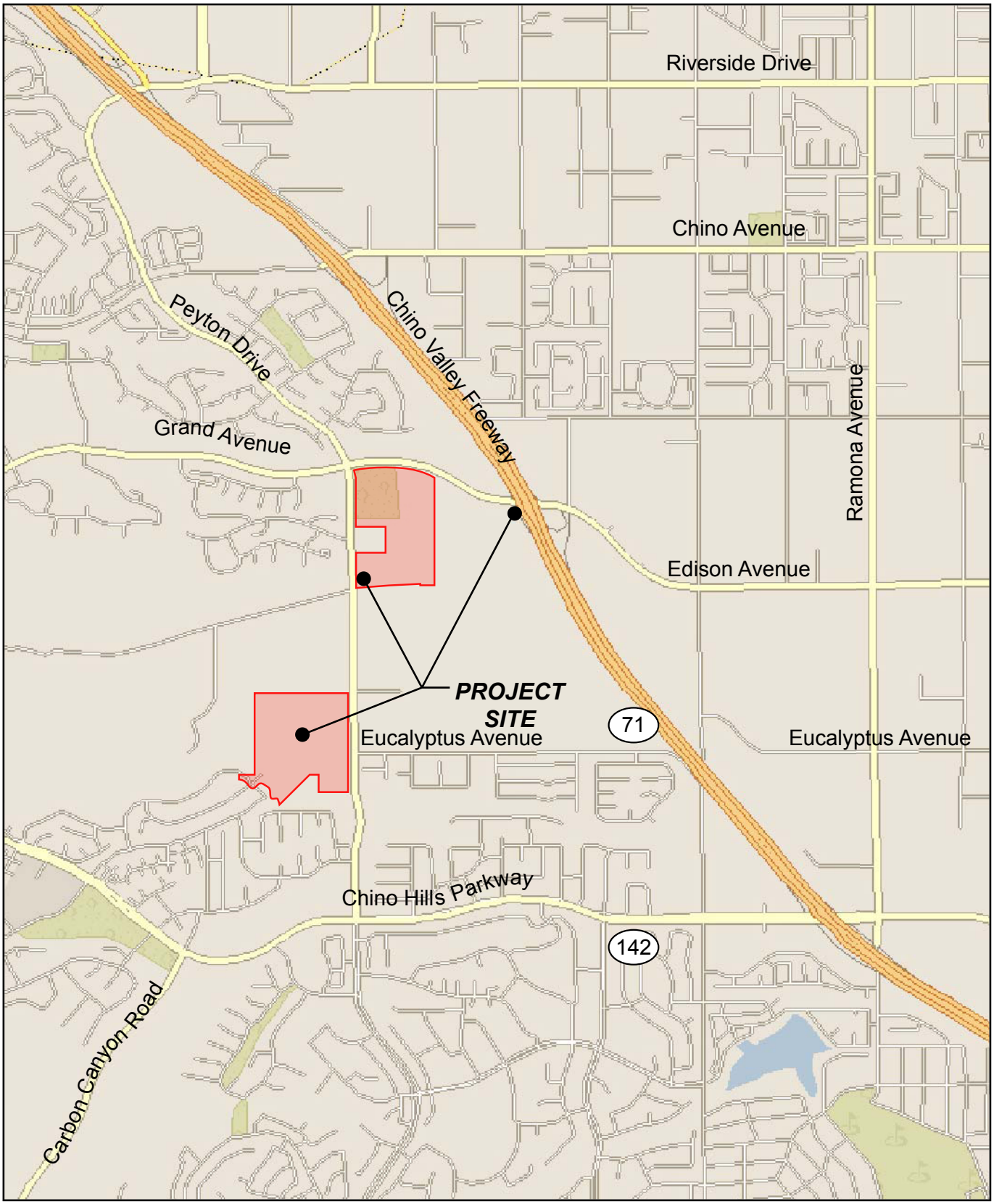
[1] Text as amended May 18, 2006.



This map contains information from sources we believe to be reliable, but we make no representation, warranty or guaranty of its accuracy.
This map is published for the use of CBRE and its clients only. Redistribution in whole or part to any third party without the prior written consent of CBRE is strictly prohibited.
© 2005 CB Richard Ellis. All Rights Reserved. Sources: CBRE Mapping Services (877) 580-4674; Claritas, Inc./GDT, Inc. MapFiles\Work2005\72451.wor 1/10/2005

Regional Vicinity Map
Exhibit 1-1

[This page intentionally left blank]



Vicinity Map
Exhibit 1-2

[This page intentionally left blank]



Aerial Photograph
Exhibit 1-3

[This page intentionally left blank]

1.5 PROJECT SETTING

1.5.1 On-Site Land Uses

Prior to adoption of the Specific Plan, the on-site land uses were as follows:

- The Shoppes Retail site was occupied by the City of Chino Hills Community Park and a San Bernardino County Sheriff substation.
- The Civic Center site was considered vacant except for a single-family residence.
- Shoppes Mixed-Use site was vacant land.
- The Community Center site consisted of primarily vacant land.
- The Community Park site consisted of primarily vacant land, with two small, vacant and abandoned corral and/or barn-type structures.

1.5.2 Surrounding Land Uses

Uses surrounding the Shoppes Retail, Civic Center and Shoppes Mixed-Use site are the commercial uses across Grand Avenue to the north and residential uses further to the north; St. Paul's Catholic Church directly to the south and Ruben S. Ayala High School further to the south; the Boys' Republic School[2] and Youth Facility to the east; and a United States Post Office to the west with Payne Ranch commercial uses, residential uses and open space further west across Peyton Drive.

Uses surrounding the Community Park and Community Center sites are the McCoy Equestrian Center to the north; the Church of Jesus Christ Latter Day Saints, residential and open space uses to the east; residential uses to the south; and residential and open space uses to the west.

1.5.3 General Plan and Zoning Designations

Table 1-1 summarizes the General Plan and Zoning Designations for the five components prior to and subsequent to adoption of the Specific Plan.

[2] Boys Republic is a private, non-profit, nonsectarian school and treatment community for at-risk youngsters. The Boys Republic was founded in 1907 and its central school and 200-acre farm are located in Chino Hills. Its mission is to give adolescent youth with behavioral, educational, or emotional difficulties an opportunity to achieve their maximum potential for responsible, self-directed life within the community.

Table 1-1: General Plan and Zoning Designations

Project Component	General Plan Designation		Zoning Designation	
	Prior to Adoption of Specific Plan	After Adoption of Specific Plan	Prior to Adoption of Specific Plan	After Adoption of Specific Plan
Shoppes Retail	Institutional Public Open Space	Specific Plan	Institutional-Public (I-2)	Specific Plan 04-01
Civic Center	Rural Residential	Specific Plan	Rural Residential (R-R)	Specific Plan 04-01 / Civic Center
Shoppes Mixed-Use	Rural Residential	Specific Plan	Rural Residential (R-R)	Specific Plan 04-01
Community Park	Public Open Space Agriculture/Ranches Low Density Residential	Specific Plan	Rural Residential (R-R) Low Density Residential (R-S) Planned Development (PD 24-125)	Specific Plan 04-01
Community Center	Agriculture/Ranches	Specific Plan	Rural Residential (R-R)	Specific Plan 04-01

1.6 OBJECTIVES FOR DEVELOPMENT OF THE SPECIFIC PLAN

This Specific Plan represents an effort to address long term objectives, including expanding the City's economic base and planning to meet future civic and residential needs. The following objectives, achieved through implementation of the Specific Plan, have been identified for the project:

- Create the opportunity for development of the highest and best use at one of the most visible intersections in Chino Hills;
- Develop an exciting, multi-dimensional, master planned development that will be engineered and conceptualized with the leadership and senior management of the City to create one of the most dynamic and visible retail developments in all of Southern California;
- Provide a permanent government center, including city administrative offices, a library, fire administrative offices, and a police/ sheriff station;
- Capture an appropriate share of the demand for upscale retail goods and services in the Chino Valley retail market area;

- Create new office space for firms wanting to locate in Chino Hills in close proximity to retail, restaurant and shopping activities;
- Create a focal point of retail and civic uses for the local community as well as for residents, businesses and visitors from throughout the area;
- Create a unique, open-air Lifestyle and cultural center with high-quality shopping, dining, commercial, office, civic, residential and other uses;
- Create an integrated live, work and shop center for the residents of Chino Hills and surrounding communities;
- Provide a central gathering place for the community;
- Provide upscale, multi-family residences close to shopping and cultural activities;
- Maintain and enhance park and recreational facilities within the City;
- Develop a financially feasible shopping destination unique among retail centers in the Chino Valley market;
- Increase sales tax and property tax revenues to the City; and
- Create local jobs.

[This page intentionally left blank]

2 DEVELOPMENT PLAN

The Land Use Plan is conceptual in nature and shows where new development might occur within the Specific Plan area. The exhibits and discussions are intended to provide guidelines for development and are schematic in nature and not meant to be a precise plan.

2.1 LAND USE PLAN

The Shoppes at Chino Hills Retail/Civic Center/Mixed-Use/Residential/Community Park Specific Plan includes proposed development consisting of up to 550,000 square feet of commercial, retail, office and restaurant development, up to 300 hotel rooms, a new civic center of up to 133,060 square feet, residential development of up to 295 dwelling units, community park facilities and a 19,000 square foot recreational community center. The total area of the Specific Plan is approximately 100 acres.

The Specific Plan development provides employment, a Lifestyle retail shopping center (i.e., shopping center projects configured in an open-air format, with quaint storefronts, ornamental streetscapes, and convenient parking, targeting sophisticated customers who appreciate shopping, relaxing, and entertainment in an environment that is designed to integrate shopping with the other activities of daily life in an urban environment), entertainment, dining, governmental services, office space, hotel and lodging, recreation and housing opportunities. The goal is to create a diverse environment catering to the needs of residents with differing lifestyle s. Pedestrian pathways, signage, landscaping and street trees provide a unifying element for the project and work in concert with the adjacent uses to create a new gathering place for the residents of Chino Hills and surrounding communities.

The Shoppes at Chino Hills Retail/Civic Center/Mixed-Use/Residential/Community Park Specific Plan Land Use Districts are illustrated in Exhibit 2-1, *Land Use Districts* and listed below.

- Shoppes Retail: The Shoppes Retail district implements the Shoppes Retail component of the Specific Plan. This designation allows for a mix of retail, commercial, entertainment, restaurant and office uses that will allow for the creation of a central core with an active street life and a vibrant retail and business center. The Shoppes Retail district also includes a freeway pylon sign, to be located along State Route 71 (Chino Valley Freeway) in the City of Chino Hills on the northeast portion of the Boys Republic property.

- Sheriff/Police[3]: The Sheriff/Police district allows for a Sheriff/Police facility. The specific location of this district provides public safety vehicles with direct and efficient access to Peyton Drive.

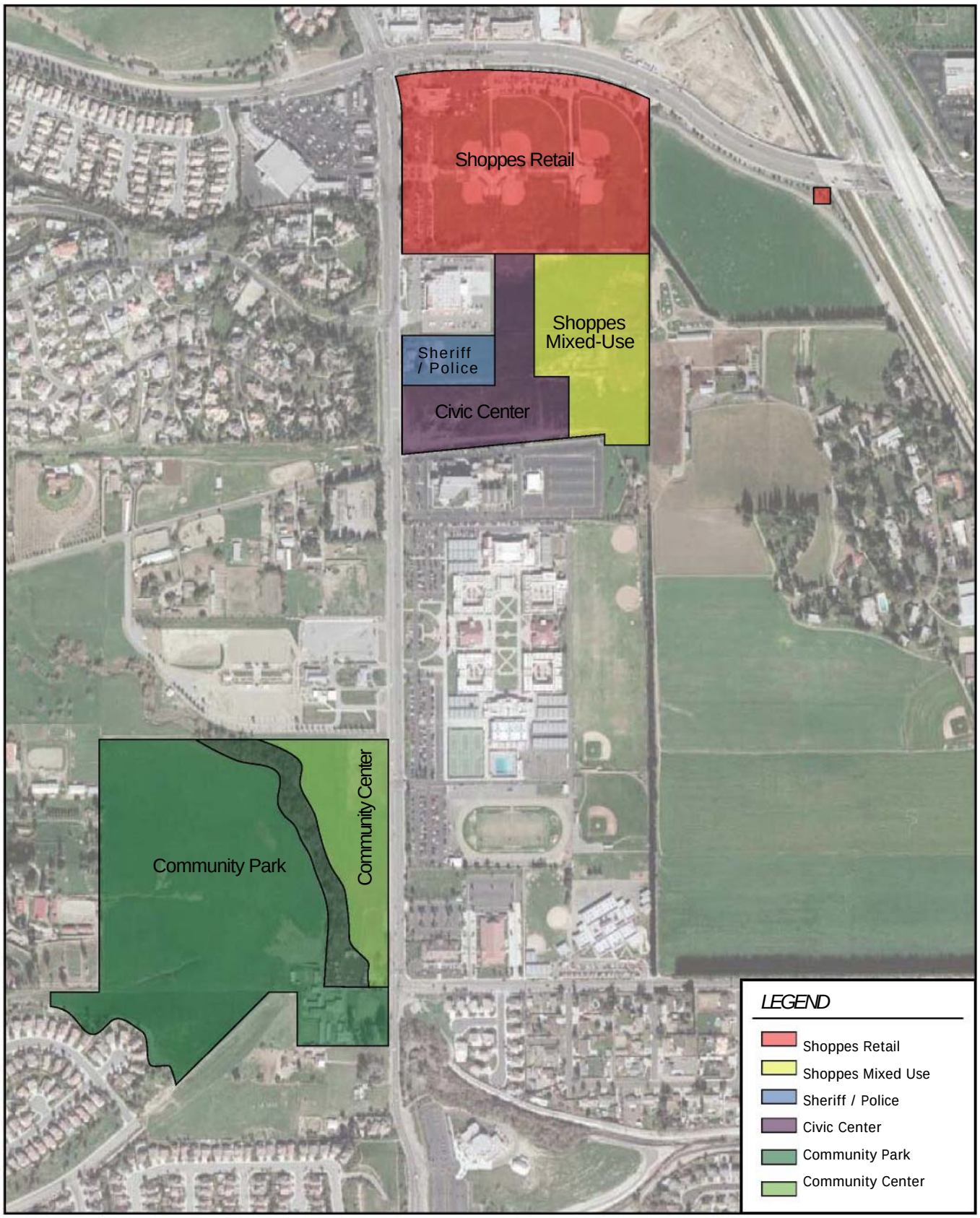
- Civic Center: The Civic Center district provides for a civic and cultural center for the City of Chino Hills. It allows for a variety of civic and public uses to serve the Chino Hills community such as City Hall, fire district administration facility, County library and civic plaza and associated on-site parking and parking structure.

- Shoppes Mixed-Use: The Shoppes Mixed-Use district provides for a mix of uses including higher density residential development in the form of townhomes, apartments and condominiums, office, commercial, retail, restaurant, hotel, on-site parking and structured parking.

- Community Park: The Community Park includes public recreational facilities as well as passive open space.

- Community Center: The Community Center district accommodates a recreational community center with a passive park component.

[3] The Sheriff/Police facility is included as part of the Civic Center discussion throughout the Specific Plan, yet remains a separate and distinct land use district for purposes of emergency access.



Land Use Districts
Exhibit 2-1

[This page intentionally left blank]

2.1.1 Shoppes Retail

The Shoppes at Chino Hills Retail district and land use designation is a mixed-use, retail, "Lifestyle Center" development totaling approximately 26 acres. Lifestyle Centers are typically characterized as:

> *"In most cases, Lifestyle Centers are open-air, main street-like developments with higher quality architecture that focuses on certain retail sectors and blend mixed-uses typical of a traditional main street. They are pedestrian friendly centers where consumers can gather in public spaces and feel part of a community. The centers are vibrant places where people can work and shop."* [4]

The Shoppes Retail development encompasses no less than 100,000 and up to 378,230 square feet of a Lifestyle Center anchored by a major (national chain) department store or major anchor store. In addition to the department store or major anchor store, the primary retail component of the project includes upscale retailers (including national, regional and local), office space, restaurants, and other commercial uses[5]. The proposed site plan for Shoppes Retail is illustrated in Exhibit 2-2. Proposed site and building area for the retail component is provided in Table 2-1.

Table 2-1: Shoppes Retail

Department Store or Major Anchor[6]	110,000 sq. ft. minimum for Department Store; or a minimum of two major retailers, each at a minimum of 20,000 sq. ft. and subject to City Manager or designee approval.		
Retail	40,000 sq. ft. maximum per individual retailer		
Restaurant	Up to 60,000 sq. ft.		
Offices	Up to 65,000 sq. ft.		
Entertainment	Up to 10,000 sq. ft.		
Total Building Area		Up to 378,230 sq. ft.	
Shoppes Retail Site Area			26.2 Acres

[4] Mattson-Teig, Beth. "Lifestyle Retail", Urban Land, Urban Land Institute, February 2004.

[5] Upscale uses are defined as nationally, regionally or locally recognized, specialty retail and restaurant tenants, with strong brand identities and integrated product lines, of a type and nature typically found in "Lifestyle Centers" throughout the United States.

[6] Anything in this Specific Plan to the contrary notwithstanding, if a minimum 110,000 square foot Department Store is constructed and opened on any individual lot within the Shoppes Retail district, then such lot, following the expiration or termination of any operating covenant applicable to the Department Store located thereon, may be used for any retail purpose permitted Section 3.2.2(A)(2) hereof, and/or any service uses (other than office uses) permitted by Section 3.2.2(A)(5) hereof, in each case, without regard to any maximum square footage limitation set forth therein.

2.1.2 Civic Center

The Civic Center land use designation includes the Civic Center and Sheriff/Police districts. The Civic Center designation occupies approximately 11.7 acres and includes up to 133,060 square feet of civic and public facility uses. Uses planned for the site include a new City of Chino Hills City Hall complex, a branch of the San Bernardino County Public Library, a Chino Valley Fire District administration facility, and a San Bernardino County Sheriff's station/City of Chino Hills Police Department substation. Other uses consistent with the Mixed-Use Specific Plan district may be permitted. Refer to Exhibit 2-2 for a conceptual site plan of the Civic Center. Proposed site and building area for the Civic Center component is provided in Table 2-2.

Table 2-2: Civic Center

City Hall	58,826 sq. ft.		
Library	28,224 sq. ft.		
Fire Department Facility	16,229 sq. ft.		
Sheriff's Substation	29,777 sq. ft.		
Total Building Area		Up to 133,060 sq. ft.	
Civic Center Site Area			11.7 Acres

2.1.3 Shoppes Mixed-Use

The Shoppes Mixed-Use land use designation is part of the Mixed-Use district. The Shoppes Mixed-Use allows up to 40,000 square feet of commercial, retail, restaurant and office space, up to 295 multi-family dwelling units and up to 300 hotel rooms. A multi-level parking structure is included to accommodate parking for the residential, retail, office and hotel components of the Shoppes Mixed Use development and may be for private use only. Other uses consistent with the Shoppes Mixed-Use district may be permitted. Refer to Exhibit 2-2 for a conceptual site plan of Shoppes Mixed-Use. Proposed site, building area and density for the mixed-use component is provided in Table 2-3.

Table 2-3: Shoppes Mixed-Use

Commercial/Retail/Restaurant /Office	Up to 40,000 sq. ft	
Multi-Family Residential	Up to 295 units	
Hotel(s)	Up to 300 rooms	
Shoppes Mixed-Use Site Area		8 Acres

2.1.4 Community Park

The Community Park district and land use designation is located in the rear portion of the Community Park/Park Residential property, furthest from Peyton Drive and directly west of the English Canyon Channel and comprises approximately 43 acres with various recreational uses and includes the relocation and enhancement of the facilities at the existing Chino Hills Community Park.

The proposed layout for the Community Park is illustrated in Exhibit 2-3, *Community Park Conceptual Site Plan.* The recreational facilities at the Community Park site, at a minimum, replace those facilities operating at the Chino Hills Community Park prior to Specific Plan adoption. The relocated park includes a tot lot, picnic areas, fields to handle baseball, softball, soccer and other seasonal recreational activities, along with restroom facilities, a snack bar and associated spectator seating and parking areas. Additional accessory uses for the Community Park may include outdoor basketball courts, a community center building and new multi-purpose trail. Site, building area and a list of possible amenities for Community Park uses are contained in Table 2-4.

The Community Park also includes the extension of Eucalyptus Avenue from its terminus at Galloping Hills Road southwest of the Park/Residential site to the proposed parking areas on the site.

Table 2-4: Community Park Uses & Amenities

Ball Fields	6	
Soccer Overlays	5	
Restroom/Concession Buildings	1,600 sq. ft.	
Maintenance/Storage Building	1,400 sq. ft.	
Maintenance Building	+2,500 sq. ft.	
Maintenance Yard	+2,500 sq. ft.	
Tot Lot	2,700 sq. ft.	
Bullpen Areas	12	
Soft Toss Areas	12	
Picnic Tables	12	
Group Picnic Areas	2	
Multi Use Trails	+3,000 linear ft.	
Community Park Site Area		43.0 Acres

2.1.5 Community Center

The Community Center district and land use designation comprises approximately nine acres of the Community Park/Community Center site. The site allows for a 19,000 square foot recreational community center. The Community Center district is located along Peyton Drive at the northern portion of the property. The proposed layout for the Community Center is illustrated in Exhibit 2-4, *Community Center Conceptual Site Plan.* Site area component is provided in Table 2-5.

Table 2-5: Community Center

Recreational Community Center	19,000± sf	
Community Center Site Area		8.9 Acres

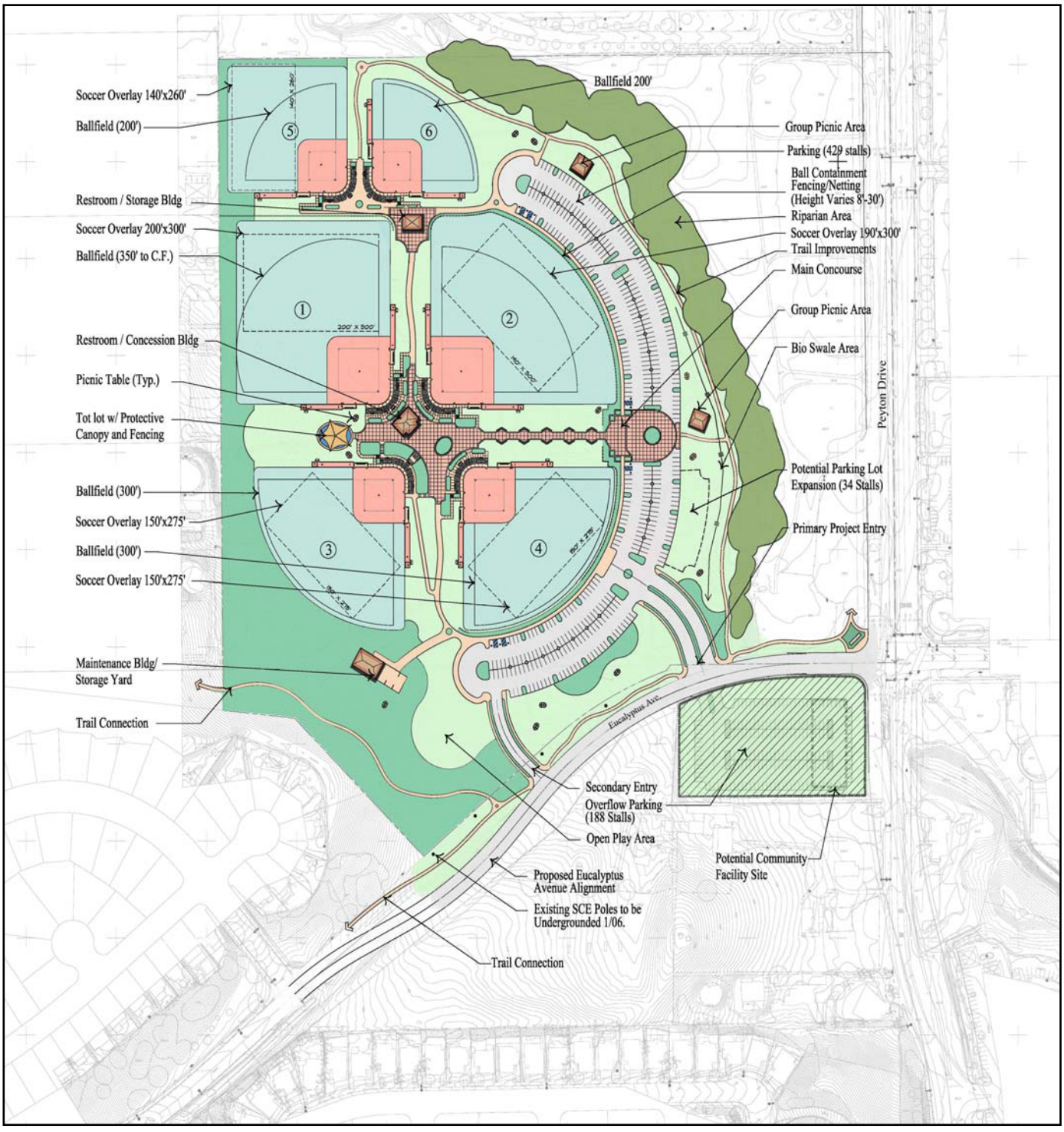


NOTE: LOCATION OF BUILDINGS AND USES WILL BE GENERALLY AS SHOWN

Amended - November 2008

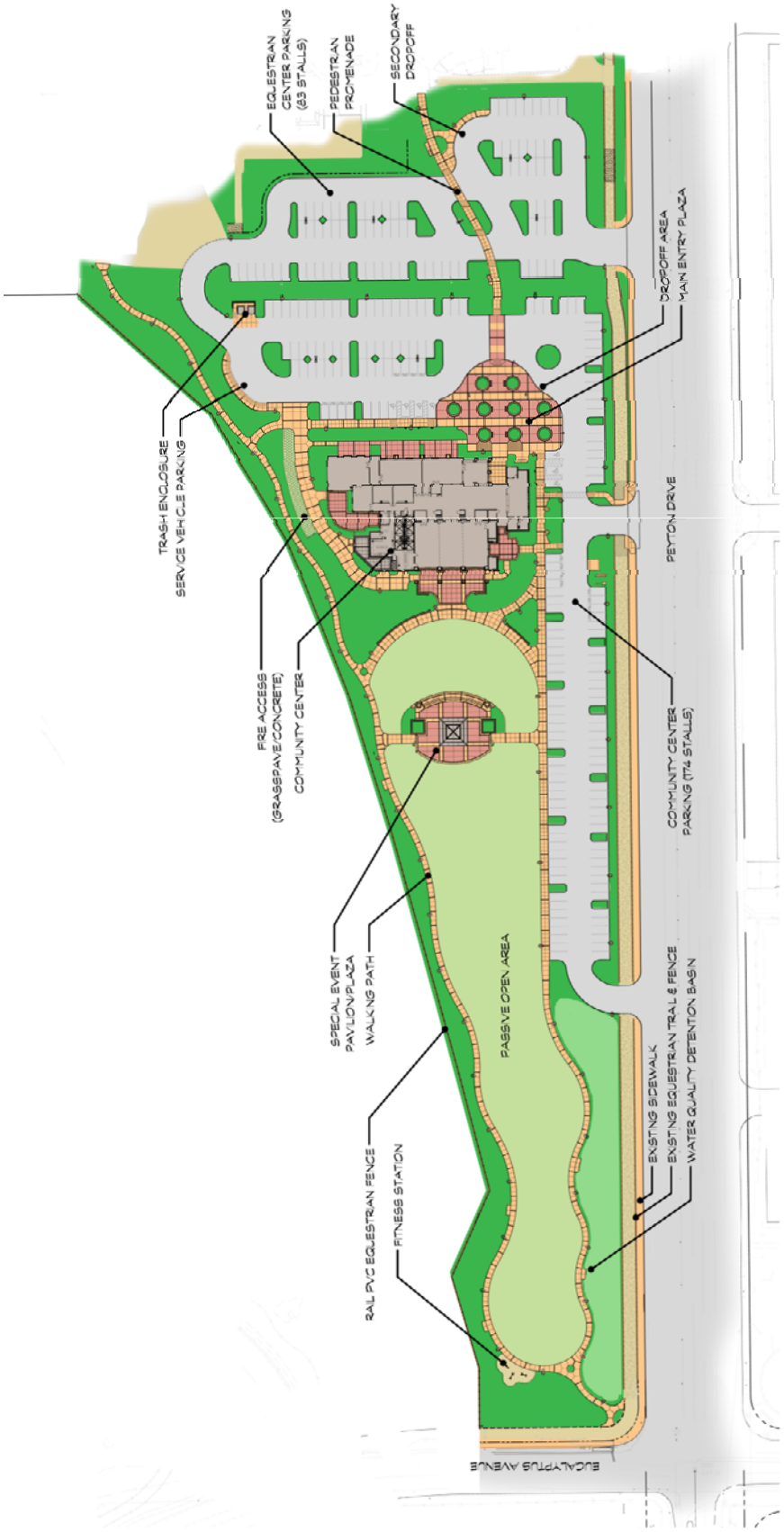
The Shoppes Retail, Civic Center, &
The Shoppes Mixed-Use Conceptual Site Plan
Exhibit 2-2

[This page intentionally left blank]



Community Park Conceptual Site Plan
Exhibit 2-3

[This page intentionally left blank]



Community Center Conceptual Site Plan
Exhibit 2-4

Not to Scale

[This page intentionally left blank]

2.2 TRAFFIC AND CIRCULATION

2.2.1 Shoppes Retail, Civic Center and Shoppes Mixed-Use Site

The traffic and circulation system for the Shoppes Retail, Civic Center, and Shoppes Mixed-Use complements the land use plan by linking retail, commercial, entertainment, restaurant, office, hotel, civic and residential land uses to each other and to other elements of the development plan. The circulation plan allows for pedestrians, delivery trucks and automobiles to exist harmoniously together. The circulation system consists of roadways and pedestrian walkways designed to facilitate an attractive Lifestyle Center that implements the vision of building a pedestrian-friendly environment. Traffic calming mechanisms such as on-street parking, paving treatments, carefully placed street trees, landscaping and other design techniques are utilized to achieve this vision.

2.2.1.1 Roadway System

Roadways existing before implementation of the Specific Plan include Grand Avenue serving as the northerly boundary of the Shoppes Retail, Civic Center, and Shoppes Mixed-Use site and Peyton Drive serving as the westerly boundary of the site. Consistent with implementation of the Specific Plan, Boys Republic Drive will serve as the easterly and southerly boundary.

On-site circulation within the Shoppes Retail, Civic Center, and Shoppes Mixed-Use site is provided through a system of public and private streets within the project. Private streets do not need to be constructed to City Standards. City Center Drive provides a north/south connection between Grand Avenue and Boys Republic Drive. City Center Drive connects the Shoppes Retail on the northern end of the site with the Shoppes Mixed-Use and Civic Center on the southern end of the site. Main Street runs east-west and terminates at the entrance to a major anchor store. Shoppes Drive provides an east/west traffic flow connection between the Boys Republic Republic Drive and Peyton Drive. The Shoppes Retail, Civic Center, and Shoppes Mixed-Use Conceptual Circulation Plan is shown in Exhibit 2-5. This exhibit shows the adjacent off-site road system as well as the major elements of the road system interior to the site.

<u>Grand Avenue – Public, Divided Major Highway</u>

Defined as a Divided Major Highway in the City of Chino Hills General Plan Circulation Element, Grand Avenue is a public, four-lane, divided roadway with a raised median, oriented in an east/west direction. It is designed to carry local and regional traffic. Grand Avenue has two (2) fully signalized vehicular entry/exit points serving the site: one new signal which serves as a major entry/exit point for the Shoppes Retail and one existing signal that provides direct access or connectivity to the Boys Republic Drive.

Peyton Drive – Public, Major Arterial

Defined as a Major Arterial in the City of Chino Hills Circulation Element, Peyton Drive is a public, north-south, four-lane divided roadway with a painted median, with three northbound lanes and one southbound lane between Grand Avenue and Eucalyptus Avenue, and with one lane in each direction between Eucalyptus Avenue and Chino Hills Parkway. It is designed to carry volumes of local and regional traffic and on-street parking is prohibited. Peyton Drive has bike lanes south of Chino Hills Parkway.

Peyton Drive provides three (3) new right in/out access points: two provide direct access to the Civic Center and one serves as an entry/exit for the Shoppes Retail, Civic Center and Shoppes Mixed-Use site. Peyton Drive will also have two (2) new, fully signalized, vehicular entry/exit points of access serving the Shoppes Retail, Civic Center and Shoppes Mixed-Use Site: one new signal will serve as a major entrance/exit for the Shoppes Retail and the other new signal will provide access to the Boys Republic Drive. Another existing traffic signal on Peyton Drive doesn't serve the project, but provides access to the Post Office and Payne Ranch gated community.

Boys Republic Drive – Public Street, from Grand Avenue to Peyton Drive

Consistent with implementation of the Specific Plan, the public, four-lane, undivided Boys Republic Drive serves the Shoppes Retail, Civic Center and Shoppes Mixed-Use site and acts as the easterly and southerly boundary of the site. The Boys Republic Drive can be accessed from both Grand Avenue and Peyton Drive. The Boys Republic Drive provides approximately ten (10) access points into the Shoppes Retail, Civic Center and Shoppes Mixed-Use. The paving width will consist of approximately fifty-two feet (52') with a minimum six foot (6') landscaped parkway on both sides of the street and a six foot (6') sidewalk on one side of the street. On-street parking is prohibited. The conceptual street cross-section is illustrated in Exhibit 2-6, *Boys Republic Drive Conceptual Street Section.*

City Center Drive –Private Street, from Grand Avenue to Shoppes Drive, Public Driveway from Shoppes Drive to the Boys Republic Drive

Additional interior circulation is provided by City Center Drive which runs north-south from Grand Avenue to the Boys Republic Drive. It connects The Shoppes Retail at the northern end of the site with the Shoppes Mixed-Use towards the southern end. The portion of City Center Drive within the Shoppes Retail property limits, extending south from Grand Avenue to Shoppes Drive, is a private street. This portion of City Center Drive is a two-lane, undivided road consisting of a sixty-two foot (62') paving width with a twenty-six foot (26') driving lane, thirteen feet (13') in each direction, and eighteen foot (18') enhanced, diagonal parking lanes in both directions with a two foot (2') parking overhang. There is a minimum fifteen foot (15') landscaped parkway including a minimum nine foot (9') sidewalk on each side of the street in this portion of City Center Drive. The dimensions of the

parking lane and the landscaped parkways including sidewalks may vary along this portion of City Center.

The portion of City Center Drive, extending south from Shoppes Drive to the Boys Republic Drive, serves as a public driveway, allows for diagonal parking lanes in both directions and is maintained by the City to public standards. The conceptual street cross-section is illustrated in Exhibit 2-7, *City Center Drive Conceptual Street Section.*

Main Street –Private Street, from Peyton Drive

Main Street runs east-west connecting to Peyton Drive and provides interior circulation to the Shoppes Retail project. The private, roadway terminates in front of the major department store within the Shoppes Retail. At the eastern end of the street, the road consists of two lanes with a sixty-two foot (62') paving width with a thirteen foot (13') driving lane in each direction and eighteen foot (18') enhanced, diagonal parking lanes in both directions. There is a minimum fifteen foot (15') landscaped parkway including a minimum nine foot (9') sidewalk on each side of the street. This portion of the street is broken up into two areas where only the twenty-six foot (26') driving lane exists at pedestrian crossings and/or street intersections. A conceptual street cross-section of Main Street looking east is illustrated in Exhibit 2-8.

As one moves west toward the intersection of Main Street and Peyton Drive, the configuration of the road changes to allow four (4) thirteen foot (13') driving lanes, with no on-street parking. There is a minimum fifteen foot (15') landscaped parkway on each side of the street. Conceptual street cross-sections for this portion of Main Street is illustrated in Exhibit 2-9.

Shoppes Drive – Public Driveway, from Peyton Drive to Boys Republic Drive

Additional interior circulation is provided by Shoppes Drive which runs east-west connecting Peyton Drive and the Boys Republic Drive. The two-lane public driveway with a minimum twenty-six foot wide driving lane runs along the north side of the United States Post Office (USPS) and serves the Shoppes Retail, Civic Center and Shoppes Mixed-Use.

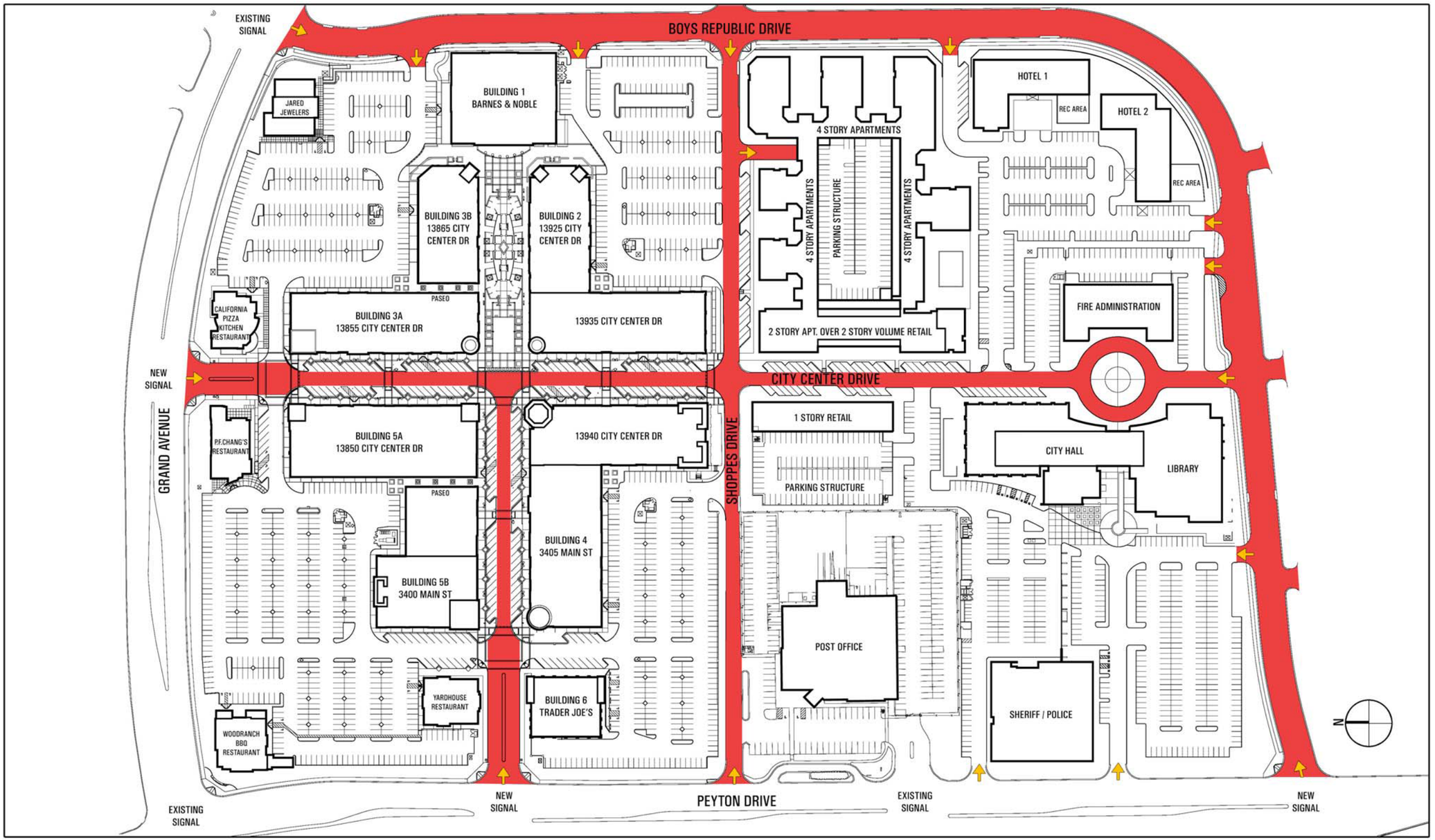
2.2.1.2 Pedestrian Access

Pedestrian access throughout the Shoppes, Civic Center, and Shoppes Mixed-Use site is an important element in the design concept for the Specific Plan. Pedestrian walkways tie the various elements and land uses together. On-site pedestrian circulation is provided by sidewalks (walkways). Walkways, located along the storefronts of Main Street and City Center Drive, are defined by the use of enhanced paving, landscape elements and street furniture.[7]

[7] Enhanced paving may include integral colored concrete with saw cut pattern including sandblast, acid wash finish, hard trowel borders, concrete interlocking paving units with accent bands, natural grey

The walkways on either side of City Center Drive and Main Street function as major pedestrian linkages within the Specific Plan area. The walkways on City Center Drive connect the major uses at the northern end (Shoppes Retail) with those uses located at the southern end of the Site (Civic Center & Shoppes Mixed-Use). The walkways on Main Street connect the major uses towards Peyton Drive with those toward the eastern end. The wide walkways, street furniture and canopy trees provide an environment where pedestrians stroll from one end of the street to the other experiencing the different uses along the way. There may be special times or events when the interior streets of the Shoppes Retail will be closed to automobiles. At these times, a pedestrian only environment may be created through the use of removable bollards or other similar methods. Pedestrian crossings clearly designated by enhanced paving at vehicle points of ingress and egress and at the street crossings provide safety by encouraging slow vehicle movement.

concrete with saw cut pattern and paver accents or borders or any combination of the materials, patterns and finishes listed.

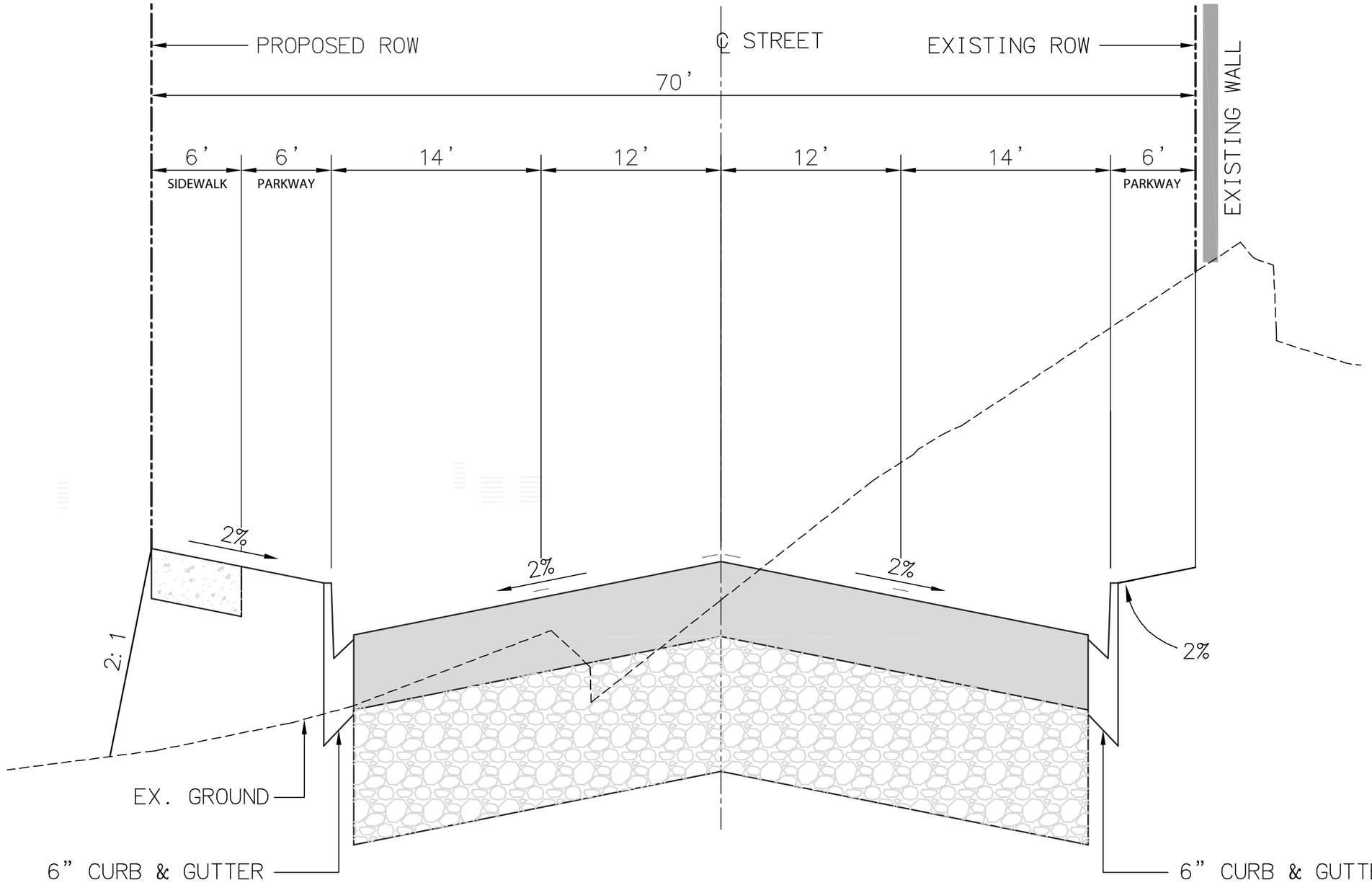


NOTE: LOCATION OF BUILDINGS AND USES WILL BE GENERALLY AS SHOWN

Amended - November 2008

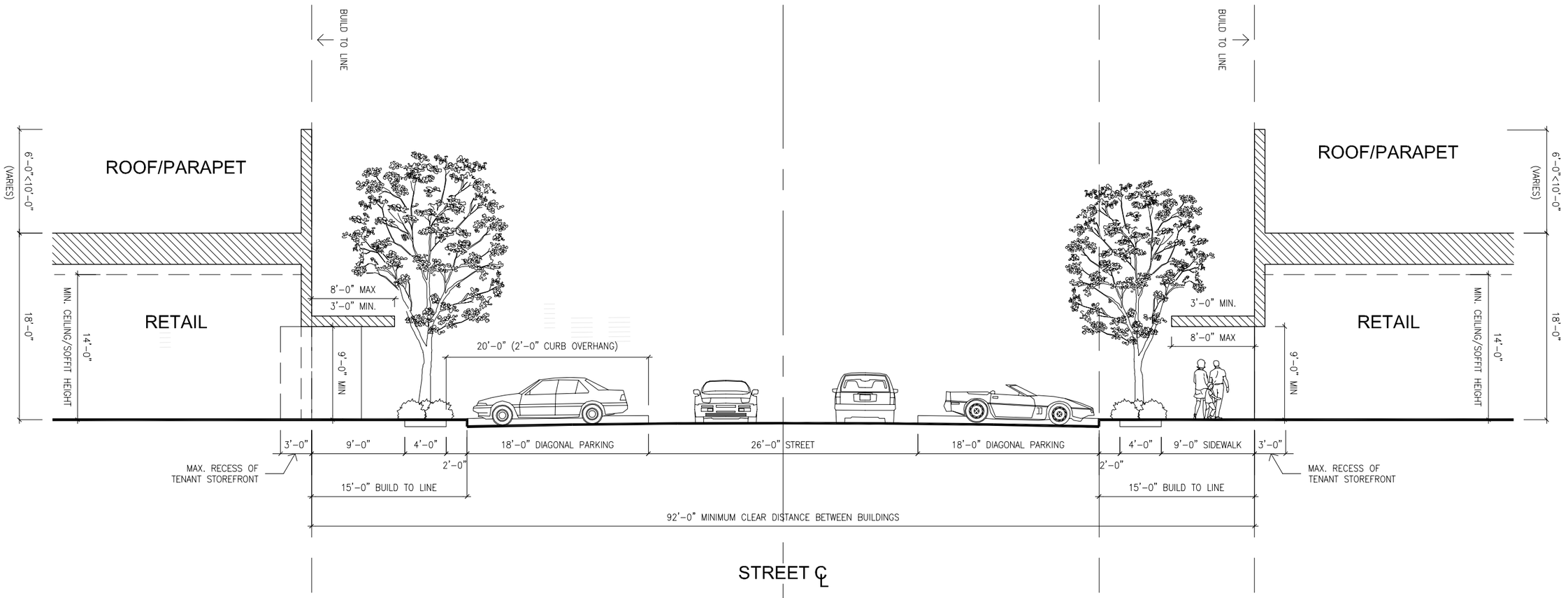
The Shoppes Retail, Civic Center, & The Shoppes
Mixed-Use Conceptual Circulation Plan
Exhibit 2-5

[This page intentionally left blank]



Boys Republic Drive Conceptual Street Section
Exhibit 2-6

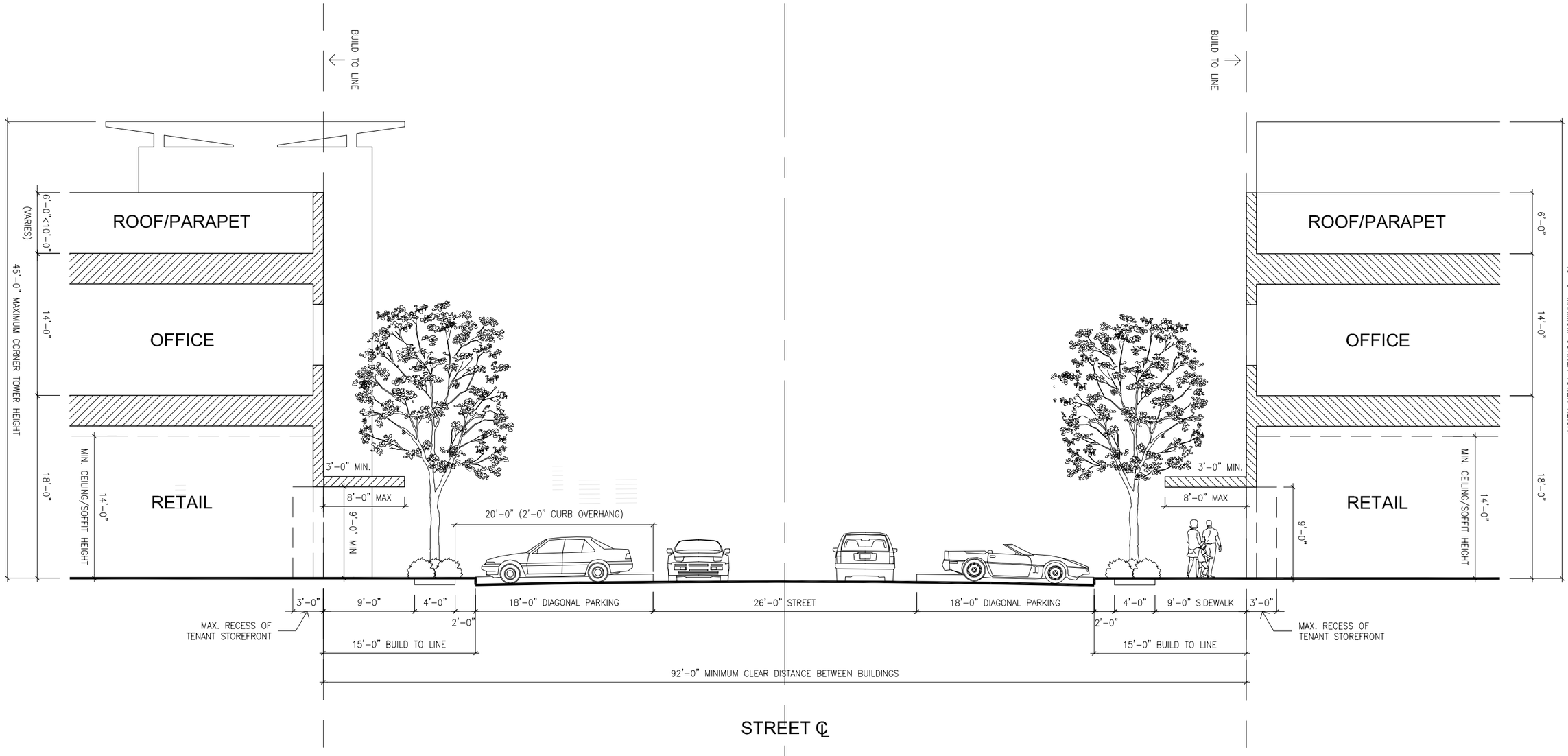
[This page intentionally left blank]



SECTION THROUGH CITY
CENTER DRIVE
LOOKING NORTH

City Center Drive Conceptual Street Section
Exhibit 2-7

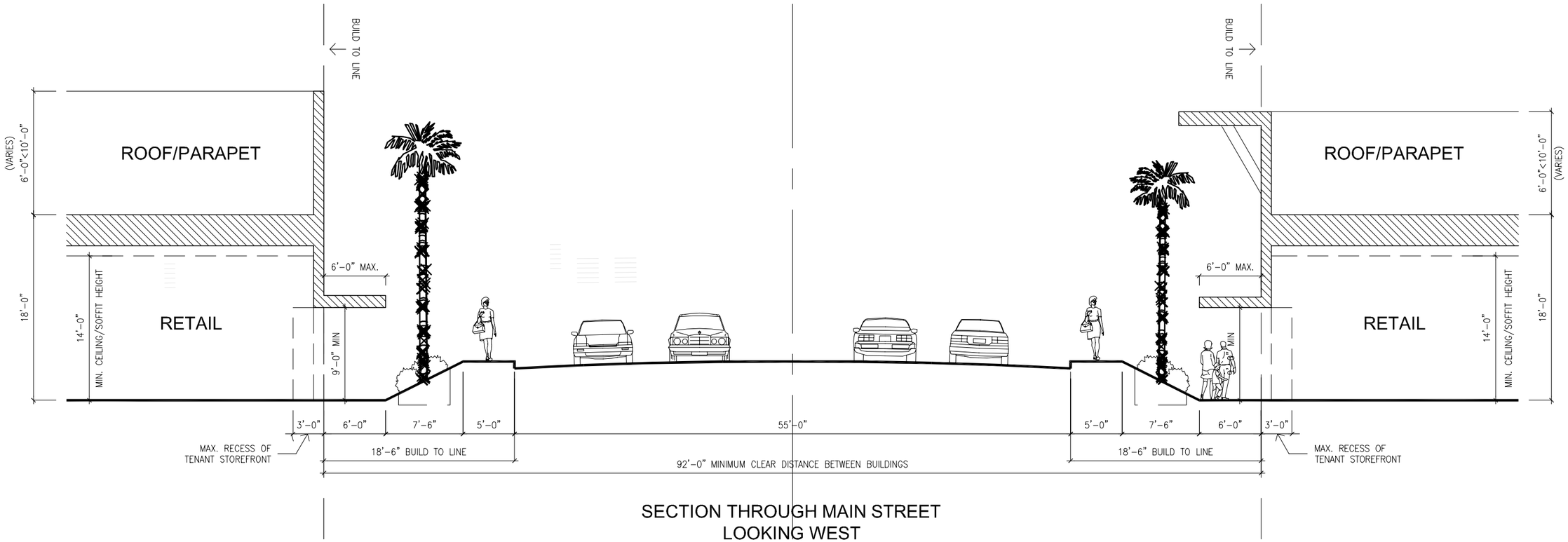
[This page intentionally left blank]



SECTION THROUGH MAIN
STREET
LOOKING EAST

Main Street (East) Conceptual Street Section
Exhibit 2-8

[This page intentionally left blank]



SECTION THROUGH MAIN STREET
LOOKING WEST

Main Street (West) Conceptual Street Section
Exhibit 2-9

[This page intentionally left blank]

2.2.2 Community Center Site

The circulation system within the Community Center site is designed to easily accommodate vehicle and pedestrian access and movement.

2.2.2.1 Roadway System

The Community Center component is served by one (1) major arterial, Peyton Drive. The main entrance is located at the existing signalized intersection serving Ayala High School. A second right in/out access point is located further south from the main entrance on Peyton Drive.

Peyton Drive – Public, Major Arterial

Defined as a Major Arterial in the City of Chino Hills Circulation Element, Peyton Drive is a public, north-south, four-lane divided roadway with a painted median, with three northbound lanes and one southbound lane between Grand Avenue and Eucalyptus Avenue, and with one lane in each direction between Eucalyptus Avenue and Chino Hills Parkway. The Peyton Drive improvement project, to be constructed in the near future by the City of Chino Hills, will widen Peyton Drive to six (6) lanes divided from Grand Avenue to Eucalyptus Avenue and four (4) lanes divided from Eucalyptus Avenue to Chino Hills Parkway. It is designed to carry volumes of local and regional traffic and on-street parking is prohibited. Peyton Drive has bike lanes south of Chino Hills Parkway. Peyton Drive provides one (1) full access point and one (1) right in/out access point for the Community Center component.

2.2.2.2 Pedestrian Access

Pedestrian access throughout the Community Center Site is provided by walkways (sidewalks). The Community Center component provides a pedestrian promenade that accommodates pedestrian access and movement between the Community Center and the McCoy Equestrian and Recreation Center.

2.2.3 Community Park Site

The circulation system within the Community Park site is designed to easily accommodate vehicle and pedestrian access and movement. Upon entry to the Community Park vehicles will be able to either park in one of the parking stalls or utilize the drop-off/pick-up area. Multipurpose trails along the perimeter of the Park provide a recreational connection to adjoining uses.

2.2.3.1 Roadway System

The Community Park is served by one (1) collector street which is Eucalyptus Avenue.

Eucalyptus Avenue –Public, Collector

Eucalyptus Avenue is a three-lane, undivided road oriented in an east-west direction east of Peyton Drive with two (2) west bound lanes and one (1) east bound lane, and a two-lane undivided roadway oriented in a east-west direction north of Chino Hills Parkway. In the City of Chino Hills General Plan Circulation Element, Eucalyptus Avenue is defined as a public, four-lane secondary highway east of Peyton between Peyton Drive and Pipeline, and it is classified as a public, two-lane collector west of Peyton Drive.

Prior to Specific Plan implementation, Eucalyptus Avenue terminated approximately 1.1 miles east of Chino Hills Parkway at Galloping Hills Road. Eucalyptus Avenue was not constructed between Galloping Hills Road and Peyton Drive. As part of the Community Park construction, Eucalyptus Avenue will be extended from its original terminus at Galloping Hills Road to the park entrance approximately 300 feet west of Chino Hills Parkway. On-street parking is allowed on this segment of Eucalyptus Avenue. The remaining 300 feet is planned to be constructed as part of the Peyton Drive improvement.

Eucalyptus Avenue provides two (2) access points to the Community Park Site. The primary entry/exit is located approximately 300 feet west of Peyton Drive and the secondary access is located further west towards Galloping Hills Road.

2.2.3.2 Pedestrian Access

Pedestrian access throughout the Community Park Site is provided by walkways (sidewalks) and multi-purpose trails. The multi-purpose trails meander along Eucalyptus Avenue and around the perimeter of the Park, and provide a possible connection to the communities located to the north of the Community Park. The Community Park has a main concourse located centrally between the sports fields that act as a gathering place for users.

2.3 INFRASTRUCTURE

The purpose of this section is to define the utilities and services that will be provided to the Specific Plan area. This section defines the major components of public and private sewage, water, drainage, solid waste disposal, energy and other essential facilities proposed to be located within or adjacent to the Specific Plan area.

2.3.1 Water

Potable water for the project is provided by the City of Chino Hills. Recycled water lines are included within the project site for connection when recycled water transmission lines are constructed. The water distribution facilities are designed and constructed in accordance with City of Chino Hills requirements. Water mains within the public right-of-way, Boys Republic Drive and Shoppes Drive shall be owned and maintained by the City.

2.3.1.1 Shoppes Retail, Civic Center, and Shoppes Mixed-Use Site

Water lines serving the Shoppes Retail, Civic Center and Shoppes Mixed-Use site include an existing sixteen inch (16") diameter line on the eastern and southern edges of the property; an existing twenty inch (20") diameter line in Grand Ave on the northern side; an existing sixteen inch (16") diameter line in Peyton Drive on the western side,an existing eight inch (8") line along Shoppes Drive and an existing twenty inch (20") transmission and eight inch (8") domestic line in Boys Republic Drive. Refer to the Conceptual Water plan provided in Exhibit 2-10, *Shoppes Retail, Civic Center and Shoppes Mixed-Use Conceptual Infrastructure Plan.*

2.3.1.2 Community Center Site

Water lines serving the Community Center site include an existing sixteen inch (16") diameter line in Peyton Drive on the site's eastern boundary.

2.3.1.3 Community Park Site

One water line exists on or near the site: a sixteen inch (16") diameter line in Peyton Drive. Another sixteen inch (16") diameter line is proposed in Eucalyptus Avenue.

2.3.2 Wastewater (Sewer)

The City of Chino Hills Sewer Division is responsible for collecting and conveying wastewater within Chino Hills. The Inland Empire Utility Agency (IEUA) is responsible for wastewater treatment.

2.3.2.1 Shoppes Retail, Civic Center, and Shoppes Mixed-Use Site

Wastewater lines serving the site include existing twelve inch (12") lines in Boys Republic Drive and Shoppes Drive that tie into an existing twelve inch (12") diameter line that crosses the Boy's Republic property to the east. The

wastewater lines are designed according to the City of Chino Hills Standard Design and are estimated to have one lateral connection for each building. Locations of major connections to wastewater lines serving the Shoppes Retail, Civic Center and Shoppes Mixed-Use site are illustrated in the Conceptual Sewer plan provided in Exhibit 2-10, *Shoppes Retail, Civic Center and Shoppes Mixed-Use Conceptual Infrastructure Plan.*

2.3.2.2 Community Center Site

Wastewater lines serving the Community Center site include an existing twelve inch (12") diameter line along Peyton Drive. On-site wastewater service is designed according to the City of Chino Hills standards and City-approved hydraulic sewer studies for the project

2.3.2.3 Community Park Site

Wastewater lines serving the Community Park site include an existing twelve inch (12") diameter line along Peyton Drive. On-site wastewater service complies with the City of Chino Hills standards and City-approved hydraulic sewer studies for the project

2.3.3 Storm Drainage

The Specific Plan area is drained by facilities provided and maintained by the City of Chino Hills in public right-of-ways.

2.3.3.1 Shoppes Retail, Civic Center, and Shoppes Mixed-Use Site

Major storm drain facilities that are forty-eight inches (48") in diameter are located along the Boys Republic Drive and Shoppes Drive (through street) at the Shoppes Retail, Civic Center and Shoppes Mixed-Use Site. This system conveys flow to the San Antonio Channel via an easement on the adjacent Boys Republic Property. Water flow is treated to comply with the County of San Bernardino's Water Quality Management Permit. Water flow is treated by man-made clarifiers and on- or off-site retention will be used. Storm drain lines within the Boys Republic Drive, Shoppes Drive and the Boy's Republic property shall be owned and maintained by the City. Storm drains lines within the Shoppes Retail and Shoppes Mixed Use project shall be owned and maintained by the Shoppes Retail and Shoppes Mixed-Use development respectively. The drainage from the retail buildings adjacent to the parking structure (along City Center Drive) is proposed for discharge into the City owned drainage system and the water quality and retenetion mitigation requirements only apply to Parcel 1 of PM 17933. Exhibit 2-10 shows the Conceptual Storm Drain Plan.

2.3.3.2 Community Center Site

The storm drain system for the Community Center development conveys stormwater into the Peyton Drive storm drain system which eventually drains into the English Canyon Channel.

2.3.3.3 Community Park Site

The Community Park site drains into the Eucalyptus Avenue storm drain system which eventually drains into the English Canyon Channel. The Community Park may have natural or artificial turf for ball fields which will include an integrated drainage system that conveys storm water to the City's storm drain system.

2.3.4 Solid Waste

Solid waste collection and disposal is provided through Chino Hills Disposal, the exclusive solid waste and recycling service provider for the City. The project is required to comply with applicable State and local regulations.

2.3.5 Utilities

2.3.5.1 Electricity

SCE supplies electrical services to the Specific Plan area and has indicated that sufficient capacity exists within the existing infrastructure to accommodate the project.

The easements for the power lines on the Shoppes Retail, Civic Center, and Shoppes Mixed-Use site is located in or adjacent to the new Boys Republic Drive, along the site's southern boundary. The easement on the Community Park and Community Center sites is located in or adjacent to the new alignment of the extension of Eucalyptus Avenue, west of Peyton Drive.

2.3.5.2 Natural Gas

The Southern California Gas Company supplies natural gas to the Specific Plan area and has indicated that sufficient capacity exists within existing infrastructure to accommodate the project. Additional points of connection are established where necessary.

2.3.5.3 Telephone, Internet and Cable

Telephone, Internet, and cable television infrastructure and service are provided along with the other utilities.

2.4 PUBLIC FACILITIES AND SERVICES

2.4.1 Public Safety

2.4.1.1 Law Enforcement

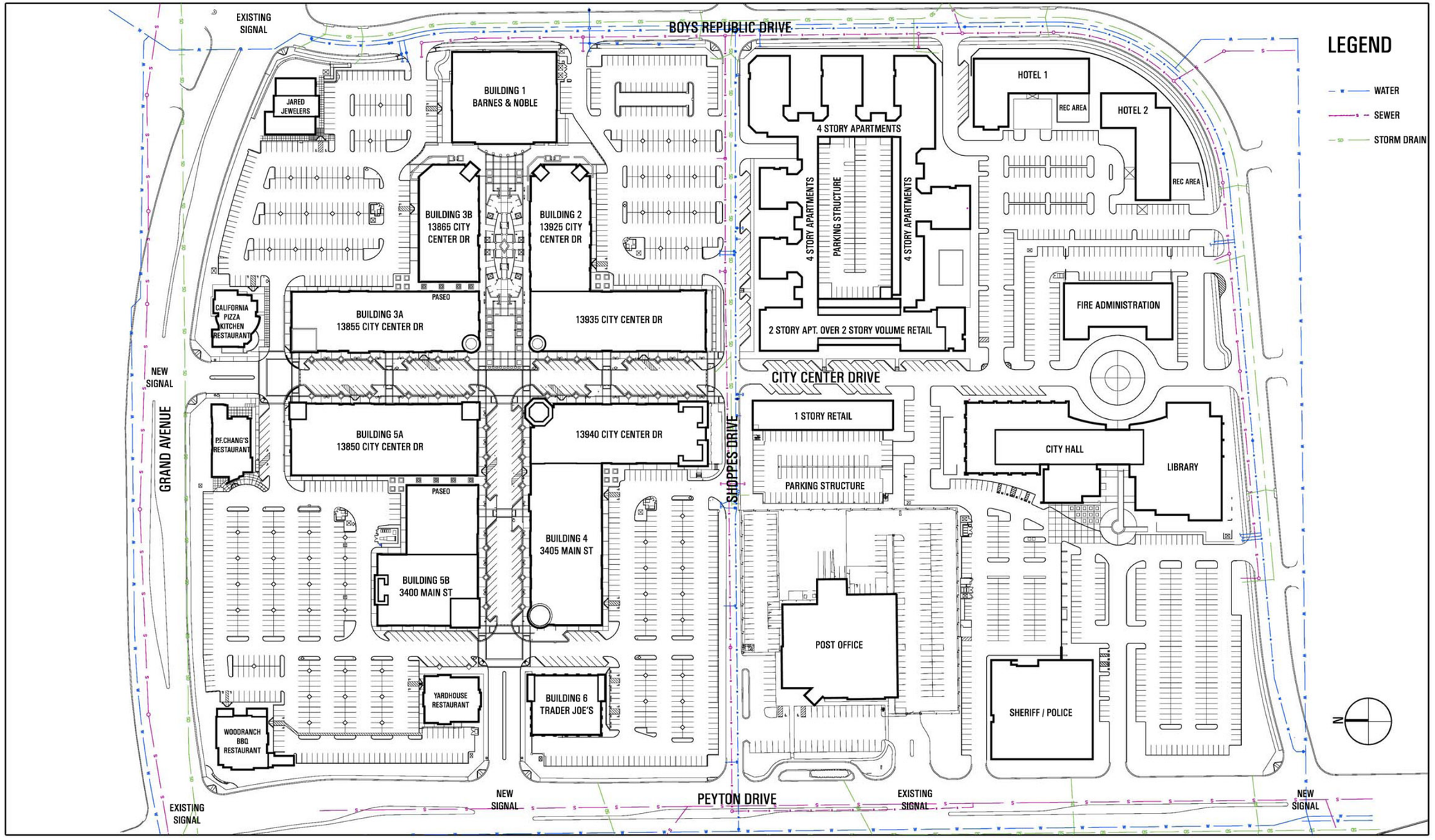
Law enforcement for the Specific Plan area is provided to the City of Chino Hills by contract with the San Bernardino County Sheriff's Department.

2.4.1.2 Fire Protection

The Chino Valley Independent Fire District (CVIFD) provides fire protection, fire prevention services, emergency medical (first responder) and rescue services, arson investigation, and hazardous material coordination for the Specific Plan area. All development within the project area complies with the requirements of the CVIFD. The water supply system is designed to meet CVIDF requirements.

2.4.2 Public Transportation

Omnitrans provides bus service for the Specific Plan area. The Peyton Drive widening project includes ten foot (10') shoulders throughout with no parking allowed on the street. This allows flexibility in locating bus stops. Bus stop locations, as determined by Omnitrans, shall consider disability access to the project sites.



NOTE: LOCATION OF BUILDINGS AND USES WILL BE GENERALLY AS SHOWN

Amended - November 2008

The Shoppes Retail, Civic Center & Mixed-Use
Conceptual Infrastructure Plan
Exhibit 2-10

[This page intentionally left blank]

3 DEVELOPMENT STANDARDS

3.1 GENERAL PURPOSE

The Shoppes at Chino Hills Retail/Civic Center/Mixed-Use/Residential/Community Park Specific Plan Development Standards define the permitted uses, sizes, design of buildings and related improvements for the five land use designations within the Specific Plan area. The Development Standards implement the Land Use Plan for the project. The Development Standards will ensure that all future development within the Specific Plan area will conform and contribute to realizing the goals and objectives of the Specific Plan. The exhibits accompanying the Development Standards are intended to provide guidelines for development; they are schematic in nature and not intended for use as precise plans. The Specific Plan Development Standards shall be applied only in the Specific Plan area.

3.1.1 References

Any reference to Development Standards shall mean "The Shoppes at Chino Hills Retail/Civic Center/Mixed-Use/Residential/Community Park Development Standards." The City of Chino Hills Development Code is referred to as the Development Code.

3.1.2 Resolution of Issues

A. Whenever this Specific Plan contains regulations or standards that differ from or conflict with the regulations and standards contained in the Chino Hills Development Code or any other applicable City regulation, rule or policy, the Specific Plan shall prevail.

B. If an issue, condition or situation arises or occurs that is not sufficiently covered or provided for in these regulations so as to be clearly understandable, those regulations of the Development Code that are applicable for the most similar issue, condition, or situation shall be used and implemented in a manner otherwise consistent with the Specific Plan. The City Manager or designee shall resolve issues, conditions or situations in manner that is consistent with these Specific Plan Development Standards. The intent is to resolve ambiguity in the regulations and ensure consistent application.

3.2 SHOPPES RETAIL: REGULATIONS FOR DEVELOPMENT

3.2.1 Shoppes Retail: Designation Intent and Purpose

The Shoppes Retail land use designation creates an area where residents, employees and visitors to Chino Hills can meet, socialize, shop, and conduct business. It is a pedestrian oriented Lifestyle Center which allows for a mix of retail, commercial, entertainment, restaurant and office uses. Sidewalks link the Shoppes Retail with adjacent civic center and Shoppes Mixed-Use. Exhibit 3-2 presents an illustrative conceptual site plan for the Shoppes Retail and Exhibit 3-3 provides conceptual elevations.

3.2.2 Shoppes Retail: Permitted Uses

A. The total square footage of development allowed on the Shoppes Retail land shall be limited to 378,230 square feet. Permitted uses within the Shoppes Retail land use designation shall include:

1. Department Store or Anchor Store. "Department Store" means a retail store that has at least 110,000 square feet of retail floor space within a single retail facility with a series of integrated departments for the sale of services, goods and merchandise of various kinds. Alternately, a minimum of two Major Anchors may be permitted, subject to City Manager or designee approval. "Major Anchor" means a retail store that has at least 20,000 square feet, and sells any of the following products: apparel, home decor, cooking, dining ware, goods, bedding and bathroom accessories, books and publications, gardening accessories and decor, outdoor living/furnishings, sporting goods, electronic goods.

2. Retail. Retail uses that do not exceed 40,000 square feet individually and, by way of example, sell any of the following products: Apparel, home decor, cooking, and dining ware, goods, jewelry, bedding and bathroom accessories, books and publications, gift shops, gardening accessories and decor, outdoor living/furnishings, sporting goods, children's toys, electronic goods. Specialty grocery stores and specialty food establishments that do not exceed 25,000 square feet are also permitted.

3. Restaurants. Permitted restaurant uses include: Full service restaurants (including those with bars serving alcoholic beverages and including entertainment as accessory uses) ("full service restaurant" means an establishment that prepares and sells food to customers that order food while seated in the establishment and have the food delivered to them and consume the food on the premises of the establishment); take out

restaurants that sell food to customers who order primarily at a counter or through call-in orders, and that allow food to be consumed on or off the premises of the restaurant but such restaurants shall not be located within 150 feet of Peyton or Grand Avenues and shall not be permitted to sell food at drive-thru facilities. The aggregate square footage for all restaurant uses shall be not more than 60,000 square feet and shall consist of a minimum of five (5) full service restaurants; take out restaurants with no waiter or waitress service shall be limited to an aggregate of 10,000 square feet.

4. Bar or night club. Bar or night club use is primarily an age restricted establishment and shall be permitted. This use shall not exceed, in aggregate, over 10,000 square feet.

5. Service uses. Professional office, professional service, or personal services on first floor limited to 5,000 square feet, and on second floor provided aggregate of service uses does not exceed 65,000 square feet. No automobile service or repair shall be allowed, including but not limited to service stations.

B. The sale of alcohol in grocery, supermarket and/or specialty retail stores (off-site sales) and in restaurants as an accessory use (on-site sales) located anywhere within the Shoppes Retail land use designation is permitted. The sale of alcohol shall be subject to licensing by the State of California Department of Alcoholic Beverage Control.

C. Throughout the Shoppes Retail, to create an atmosphere that encourages pedestrian traffic and invites people to walk between uses, outdoor vendors are permitted as an accessory use. While the vendors' cart or kiosk may appear to be temporary in nature, they shall be designed to complement the architectural style of the other buildings on site and integrated into the site design to provide for easy pedestrian access. The size and location of vendor carts shall be limited as determined by the Shoppes Retail management in order to ensure that business is oriented to the pedestrian and not surrounding streets and to provide for adequate pedestrian circulation around the use.

D. Due to the unique nature and specialty uses of the Shoppes Retail, Development Code Section 16.12.020, "Permitted uses, accessory uses, temporary uses and conditional uses" including Appendix A, "Regulation of Uses by Zoning District" shall not apply to the Shoppes Retail land use designation.

3.2.3 Shoppes Retail: Development Standards

A. Table 3-1 outlines the general Development Standards for the Shoppes Retail designation. Additional guiding principles are outlined in Section 4, *Design Guidelines.*

Table 3-1: Shoppes Retail: Development Standards

Development Standard	Shoppes Retail
A. Minimum Lot Size, GLA [1]	5,000 sf
B. Minimum Lot Dimensions ♦ Width ♦ Depth	 50' ft 50' ft
C. Maximum Height	50' ft. to roofline; 80' ft. to architectural feature.
D. Landscaping Required	Minimum 10% of the Shoppes Retail designation must be landscaped (may include planted areas & enhanced hardscape)
E. Parking Lot Landscaping	Minimum 2% of parking areas (exclusive of loading areas) must be landscaped. This landscaping may be counted toward the total site area landscaping required in item D above.
F. Maximum Floor Area Ratio (FAR)	No maximum floor area ratio.
G. Minimum Street-Side Building Setbacks [2] ♦ Setback from Grand Avenue ♦ Setback from Peyton Road ♦ Setback from Boys Republic Drive ♦ All other setbacks	 15' ft. 15' ft. 5' ft. 0' ft.
H. Minimum Internal Street –Side Building Setbacks[2]	0' ft.

Abbreviations: GLA = Gross Leasable Area; sf = square feet; ft = feet

Notes:

[1] Gross Leasable Area (GLA) shall be defined as the total space designed for exclusive use of the tenant and generally excludes common area and space devoted to heating, cooling, and other equipment of the building, including shafts or structural members.

[2] See Section 3.3.3.B for definition of a street-side building setback.

B. Street-Side Building Setbacks: A street-side building setback is the minimum distance required between any public right-of-way line and any part of a building or structure on the Shoppes Retail site. No minimum setback between any private street and any part of a building or structure in the Shoppes Retail site is required.

C. In addition to the standards outlined in Table 3-1, the following shall apply to all development projects proposed within the Shoppes Retail designation:

1. Roof top areas of commercial structures shall be shielded and screened from view from Grand Avenue and Peyton Drive by parapets or other finished architectural features.

2. Open space requirements as outlined in Development Code Section 16.08.070, "Open space requirements," shall not apply to the Shoppes Retail designation. The project is not required to set aside open space or dedicate open space to the City.

3.2.3.1 Maximum Projections into Street-Side Building Setback Areas

All required setback areas shall be open and unobstructed from finished grade to the sky except that projections into street-side setback areas which are permitted as indicated in Table 3-2. The architectural projections listed in the table must be attached to the principal building existing or planned on-site.

Table 3-2: Shoppes Retail: Maximum Projections into Street-Side Building Setback Areas[1]

Feature	Grand Avenue	Peyton Drive	Boys Republic Drive	Maximum Projection Above Height Limit
	Maximum Projection into Setback Area[1]	Maximum Projection into Setback Area[1]	Maximum Projection into Setback Area[1]	
Antennas/Satellite Dishes	Not permitted	Not permitted	Not permitted	Not permitted
Awnings	3'0"	3'0"	3'0"	Not permitted
Architectural Projection: Cornices, Eaves, Roof Overhangs	4'0"	4'0"	4'0"	See Table 3-1, item C.
Patios, Open & Enclosed	5'0"	5'0"	5'0"	Not permitted
HVAC, Mechanical Equip.[2]	5'0"	5'0"	5'0"	Not permitted[2]
Signs[3]	8'0"	8'0"	3'0"	Per City approved sign program
Pad Transformers (above ground utility cabinets)	5'0"	5'0"	5'0"	Not permitted

[1] See Section 3.3.3.B for definition of a street-side building setback.
[2] All air conditioning units and mechanical equipment shall be screened from view by solid walls with exterior finishes to match or compliment surrounding buildings and uses.
[3] Signs (monument and entryway) within clear areas shall not exceed 30" in height.

3.2.3.2 Line-of-Sight Triangle

A. A line-of-sight triangle defines an area of land adjacent to an intersection within which the height of structures, signs, walls, fences, plant materials, and any other physical object(s) is limited for the purpose of maintaining the line-of-sight between motorists and/or pedestrians on any other approach to the same intersection. A line-of-sight triangle shall be indicated with appropriate dimensions on site plans at each intersection of a public street with any other public or private street(s).

1. Each line-of-sight triangle at controlled intersections shall be determined and configured according to Caltrans standards as described in Topic 405 of the Caltrans Highway Design Manual.

2. Each line of sight triangle at the uncontrolled intersection of two public streets shall be configured as shown in Exhibit 3-1a "Line of Sight Triangle for Public Streets" and two sides of equal length shall have a minimum distance of twenty feet (20').

3. Each line-of-sight triangle at the uncontrolled intersection of a public street with a private street or public driveway shall be configured as shown on Exhibit 3-1b "Line of Sight Triangle for Private Street or Driveway" and two sides of equal length shall have a minimum dimension of ten feet (10').

4. The above standards do not apply to the uncontrolled intersection of two private streets.

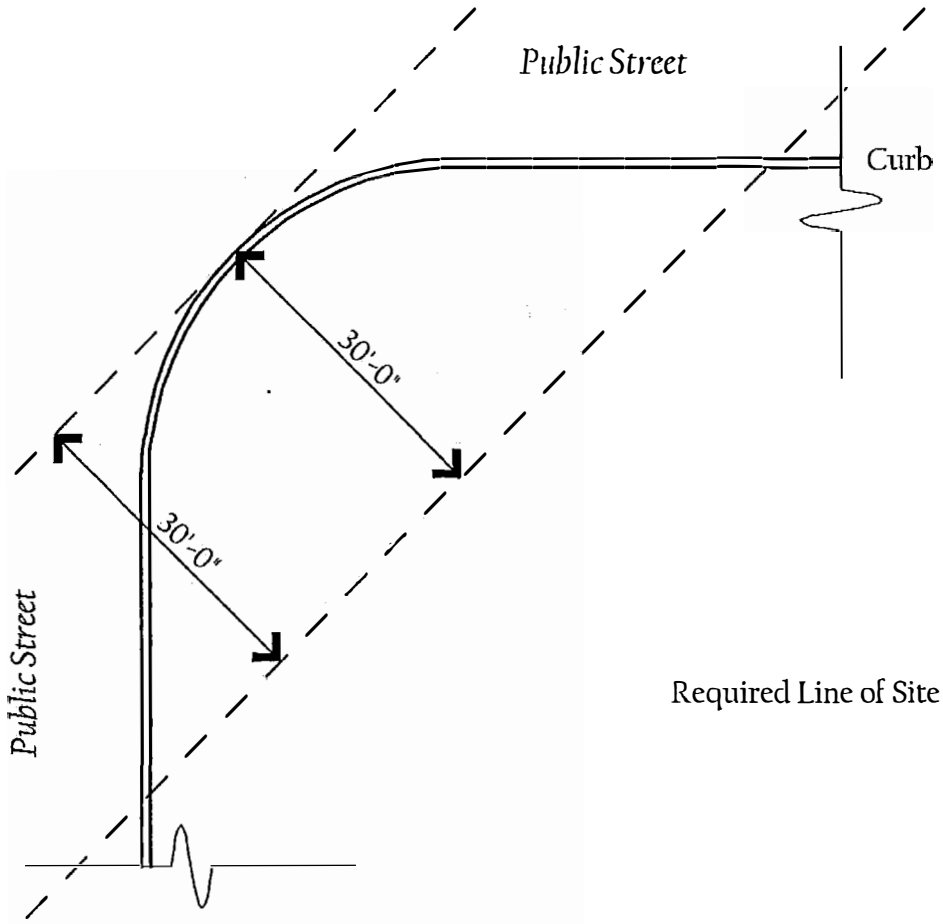


Figure 3-1a: Line of Sight Triangle for Public Streets

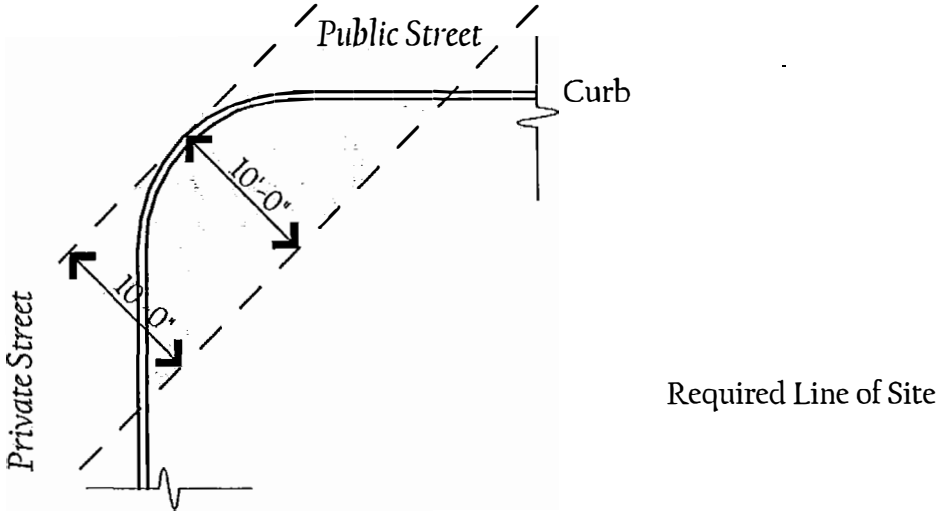


Figure 3-1b: Line of Sight Triangle for Private Street or Driveway

Line of Sight Triangle
Exhibit 3-1

[This page intentionally left blank]

3.2.3.3 Entertainment Uses

Primary entertainment uses such as a bar or night club shall be subject to the provisions of Development Code Section 16.12.070, "Entertainment establishments providing dancing, music, and similar activities" require submittal of a security plan to the City for review and approval. For restaurants whose primary use is an eating establishment, no security plan shall be required unless a security plan is a condition of licensing by the Department of Alcoholic Beverage Control.

3.2.3.4 Outdoor Accessory Uses and Events

A. Periodic use of portions of City Center Drive and Main Street within the Shoppes Retail designation for civic and promotional events shall be permitted. Those portions of these streets that are privately owned may be closed on a temporary basis during such events, without City approval. Because those portions of City Center Drive and Main Street within the Shoppes Retail designation are privately owned, maintained, and integrated within the Lifestyle Center format, and because the nature, places, and times of such civic and promotional events are subject to restrictions imposed by common area property management to maintain the quality and ambiance of the Shoppes Retail, the requirements of Development Code Section 16.40.050, "Special outdoor events," shall not apply.

1. Civic and promotional events on City Center Drive and on Main Street may include product displays, product promotions, and/or product demonstrations that shall be subject to restrictions imposed by common area property management and shall be exempt from Section 16.12.080, "Outdoor display and storage", of the Development Code provided such uses are consistent with the retail uses within the Shoppes Retail designation.

2. Outdoor storage shall not violate line of sight standards as outlined in Section 3.3.3.2 of this Specific Plan.

3. In order to create and enhance the Lifestyle Center ambiance, an outdoor sound system may be installed to provide background music and to serve as a public address system. Noise standards contained in Table N-1 "Noise/Land Compatibility Matrix" of the City of Chino Hills General Plan Noise Element shall apply and shall be used to define acceptable and unacceptable noise levels.

3.2.3.5 Trash Enclosures / Refuse Bins

A. Receptacles (bins) for the collection of refuse and recyclable materials generated within the Shoppes Retail designation shall be generally located as shown on Exhibit 3-2, *Shoppes Retail Conceptual Site Plan.*

B. All trash enclosures shall be designed with a walk-in access component.

C. Enclosures shall be provided for bins and shall consist of six (6) foot-high split face block masonry walls, , and solid, view-obscuring gates with self-closing devices.

3.2.3.6 Walls and Fences

A. Walls and/or fences, including retaining walls, may be permitted along the street and within street-side setback areas, provided they are outside of the public right-of-way and do not exceed twelve feet (12') in height. Location and design of a wall or fence is subject to review and approval by the City Manager or designee. Development Code Section 16.06.120, Subsections B, C, and D titled, "Fences, walls and hedges," shall not apply to the Shoppes Retail designation.

B. All walls shall be made of high-quality pre-cast concrete or of comparable material as approved by the City Manager or designee. Decorative coping requirements shall not apply to the Shoppes Retail designation.

C. There are active outdoor use areas, such as restaurants with outdoor eating areas, associated with the Shoppes Retail designation. Due to the proximity of these areas to Grand Avenue and Peyton Drive, these outdoor active use areas would be exposed to traffic noise levels. To reduce noise levels, sound barriers may be required for affected buildings and eating areas. Sound/noise barriers may consist of glass, plexi-glass or other similar transparent material and shall be a minimum six feet (6') in height.

3.2.3.7 Parking and Loading

A. The Shoppes Retail integrates a variety of retail goods and services uses with varying parking requirements, peak hour parking demands, and vehicle loading needs. Flexibility in meeting these varying requirements and demands is accommodated through inclusion of on-site parking and loading areas as part of the common area shared by tenants and occupants of the Shoppes Retail. Access to and use of common area shared parking shall be maintained through real property agreements applicable to all uses in the Shoppes Retail designation.

In recognition of these circumstances, the requirements of Development Code Chapter 16.34, "Parking and Loading," are not applicable and the location of parking and loading facilities that shall be required to be provided by the

developer are generally shown on Exhibit 3-2, *Shoppes Retail Conceptual Site Plan*, and in Table 3-3.

Table 3-3: Shoppes Retail Parking Requirements

Use	Required Number of Spaces
Retail/Commercial/Entertainment/Office/Restaurant Mix	Minimum 3.25 spaces/1000 SF-GLA[1]

Abbreviations: SF = Square feet, GLA = Gross Leasable Area
Notes:
[1] Gross Leasable Area (GLA) shall be defined as the total space designed for exclusive use of the tenant and generally excludes common area and space devoted to heating, cooling, and other equipment of the building, including shafts or structural members.

[2] Fractional spaces - If the calculation of required parking spaces results in a fractional number (greater than 0.5) that number shall be rounded up to the next whole numbered parking space.

B. Parking facility development standards:

1. Parking space dimensions - The minimum size of a parking space shall be nine feet (9') wide and nineteen feet (19') long including the two foot (2') curb overhang, if applicable. The minimum size of a handicapped parking space shall be as directed by Title 24 of the California Code of regulations.

2. Parking access - The minimum width of the parking lot drive aisles located along City Center Drive and Main Street shall be twenty-six feet (26'). The width of the non-fire access parking lot drive aisles located in the Shoppes Retail shall be a minimum of twenty-four feet (24'), and is subject to review and approval of the City Manager or designee.

3. All parking spaces and associated driveways shall be entirely paved with concrete or asphalt-type surfacing per City standards and requirements

4. Pavement graphics, directional signs and arrows shall be provided on parking lot drive aisles.

5. Parking space delineation – All parking spaces shall be clearly marked with paint or another easily distinguishable material and all spaces shall be delineated with double lines.

6. Metered parking may be provided along Main Street and City Center Drive for customer use only. Parking meters shall be patrolled by the City of Chino Hills.

C. Valet parking – Valet parking shall be permissible within the Shoppes Retail designation for restaurants, department stores and other retailers.

1. Valet parking may be provided anywhere on-site by Shoppes Retail management.

2. The number of proposed parking spaces to be utilized shall be sufficient to ensure that the valet parking operation should not unduly affect the availability of on-street parking spaces.

3. The proposed traffic flow and location of the valet station or stations should not create undue traffic congestion in the area proposed for the valet service

D. Loading Space Requirements:

1. Number of spaces – A minimum of four (4) loading spaces shall be provided within the Shoppes Retail designation.

2. Dimensions – - The minimum size of a loading space shall be at least ten feet wide (10') with a minimum length of 19 feet (19').

E. Bicycle Parking Standards:

1. Five (5) bicycle parking/storage spaces shall be located in one, area/location within the Shoppes Retail designation.

2. The Shoppes Retail designation shall be exempt from Section 16.34.110, "Bicycle parking standards", of the Chino Hills Development Code.

3.2.3.8 Trip Reduction Program

The Shoppes Retail designation shall be exempt from Section 16.36, "Trip Reduction Program", of the Chino Hills Development Code.

3.2.3.9 Signs

A. Temporary Signs: Temporary signs not visible from the public right-of-way are permitted, subject to City Manager or designee review and approval of a sign program. Pending City approval of said sign program, such temporary signs may not be subject to issuance of a temporary sign permit by City and not otherwise subject to restriction unless such signage is declared hazardous or unsafe by the City. Temporary signs visible from the public right-of-way are subject to the City of Chino Hills Development Code.

B. Tenant Signs: Tenant signs including standardized and logo signs of retailers with multiple store locations shall be permitted subject to size, height, bulk, and location regulations and subject to City Manager or designee

review and approval of a sign program. Pending City approval of said sign program, such tenant signs are to be consistent throughout the Shoppes Retail and tenants shall be allowed to install and maintain tenant brand, logo, and/or prototype signage advertising the names and logos of their uses within the development.

C. Freeway Oriented Signs:

1. Along the Chino Valley Freeway (SR-71), a Pylon/Reader Board sign may be located on the Boys Republic Property as shown in Exhibit 4-11, *Pylon Sign Location.* The sign shall be subject to City Manager or designee review and approval of a sign program, and may be up to 100' tall and 40' wide and indicate "The Shoppes at Chino Hills", a project logo and/or icon, "City of Chino Hills", and the names of the tenants. Maximum sign area is 2,000 square feet per side. Individual letter height shall be no more than 75" inches.

2. An electronic reader board may be included to identify upcoming cultural events and advertising for the project. The reader board shall be incorporated into the Pylon Sign.

3. The Shoppes Retail designation shall be exempt from Section 16.38.070, "Freeway-oriented signs", of the Chino Hills Development Code.

D. Additional details on the Specific Plan signage program can be found in Section 4, *Design Guidelines.*

3.2.4 Shoppes Retail: Landscaping and Lighting

Landscaping and lighting is an essential element to create the unique character of the Shoppes Retail. The location, design and detail of the landscaping and lighting shall be compatible with and reflect the spirit and quality of the Specific Plan objectives. In recognition of these circumstances, the landscape and lighting requirements of the City of Chino Hills Landscaping and Lighting Manual, 1992 and the Chino Hills Municipal Code are waived and shall not apply to the Shoppes Retail designation. All landscaping and lighting shall be subject to approval by the City Manager or designee.

A. The project shall be enhanced with larger than minimum sized plant material at the following entry focal points and/or main project entrances:

1. Southwest corner of Grand Avenue and the Boys Republic Drive;

2. Southeast corner of Grand Avenue and City Center Drive;

3. Southwest corner of Grand Avenue and City Center Drive;

4. Southeast corner of Grand Avenue and Peyton Drive. Streetscape improvements at the southeast corner of Grand and Peyton shall provide for an easement to accommodate the Citywide Identity Enhancement Program as specified by the City Manager or designee;

5. Northeast and southeast corners of Peyton Drive and Main Street

B. Pedestrian hardscape illustrated on Exhibit4-8, *Shoppes Retail Conceptual Landscape Plan*, such as walkways and plaza/patio areas shall be enhanced. Enhanced paving will generally be located along the storefront walkways of Main Street and City Center Drive, primary pedestrian crosswalks, the Department Store plaza and at the Main Street and City Center Drive intersection. Enhanced paving shall be defined by the following materials:

1. Integral colored concrete with saw cut pattern including sandblast or acid wash finish;

2. Concrete interlocking paving units with accent bands;

3. Natural grey concrete with saw cut pattern including a sandblast or acid wash finish with paver accents or borders;

4. Any combination of the above materials, pattern and finishes.

C. Standard pedestrian paving will be permitted only along the rear of the retail buildings where tenant service doors and loading activities are to take place or at other areas of secondary pedestrian access not affiliated with the retail storefronts. Standard pedestrian paving shall be defined by natural grey concrete with saw cut pattern including a sandblast or acid wash finish with paver accents or borders.

D. Exterior lighting shall be energy-efficient and shielded or recessed so that direct glare and reflections are contained within the boundaries of the Shoppes Retail district. No retail tenant lighting shall blink, flash, or be of unusually high intensity or brightness. All lighting fixtures shall be appropriate in scale, intensity, and height to the use it is serving. Parking lot lights shall not exceed forty (40') in height. Lighting of outdoor areas shall be designed and maintained in a manner to prevent glare or direct illumination from intruding into off-site areas.

E. Additional details on the landscape of the Shoppes Retail can be found in Section 4, *Design Guidelines*.

3.2.5 Shoppes Retail: Architecture and Design

A. The architecture of the Shoppes Retail is an eclectic blend of individual storefront designs distinguishing each retail, office, restaurant, and department store tenant from every other in the center while reinforcing the unique image and product or service of each. While encouraging uniqueness among tenants, design guidelines for the Shoppes Retail recognize the value of brand recognition for retailers with multiple store/restaurant locations. A retailer with multiple stores/restaurants typically employs a retail or restaurant format that is common among locations and may include standardized signs, architecture, design, interior and exterior colors, forms, shapes, materials, and the display of standardized logos to promote and enhance the company's image, products or services. Multiple store retailers include those whose market areas may be the local area or regional, national, or international markets. Accordingly, each tenant that is part of a multiple location retail or restaurant organization shall be permitted to construct and improve premises at the Shoppes Retail that are consistent with that company's retail or restaurant prototype format, including but not limited to, standardized signs, architecture, design, interior and exterior colors, forms, shapes, and materials, and the display of standardized logos, sign text, script, color, outdoor eating areas and patios, awnings and text thereon, lighting, and landscaping and shall not be subject to City review and without restriction or condition except as to size, bulk, height, or location restrictions applicable throughout the Shoppes Retail.

B. Additional details on the design and architecture of the Shoppes Retail can be found in Section 4, *Design Guidelines*.

[This page intentionally left blank]



NOTE: LOCATION OF BUILDINGS AND USES WILL BE GENERALLY AS SHOWN

Shoppes Retail
Conceptual Site Plan
Exhibit 3-2

Amended - November 2008

Not to Scale

[This page intentionally left blank]

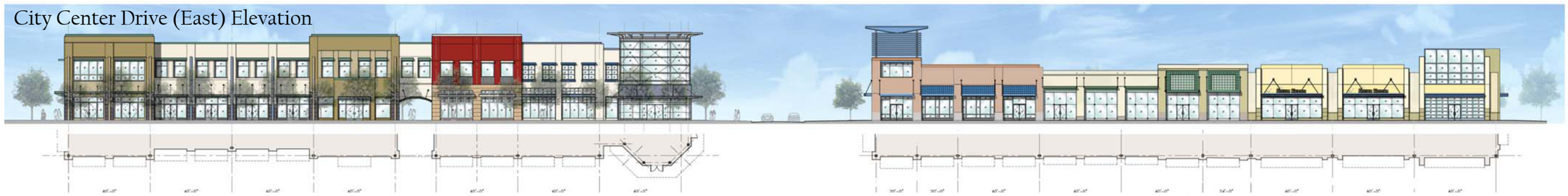
City Center Drive (West) Elevation



Building 3

Building 4

City Center Drive (East) Elevation



Building 6

Building 5

Main Street (North) Elevation



Building 4

Building 6

Main Street (South) Elevation



Building 5

Building 3

The Shoppes Retail
Conceptual Elevations
Exhibit 3-3

[This page intentionally left blank]

3.3 CIVIC CENTER REGULATIONS FOR DEVELOPMENT

3.3.1 Civic Center: Designation Intent and Purpose

The Civic Center land use designation is an area where the City's government and institutional center resides, however it is integrated with the residential, retail, recreational, civic and cultural activities within the Specific Plan area. A key objective of the Civic Center concept is to provide a civic and community center and a public gathering area for Chino Hills' residents and business members. The Civic Center includes the City Hall at 58,826 square feet and a library at 28,224 square feet. Additionally, the area incorporates the Chino Valley Independent Fire District administration facility of 16,229 square feet. Within the Sheriff/Police land use district, a 29,777 square feet Sheriff's facility completes the Civic Center concept.

3.3.2 Civic Center: Permitted Uses

A. The Civic Center land use designation provides for institutional, civic and cultural uses intended to serve the needs of the Chino Hills community and that are consistent with the intent of the Specific Plan.

B. Other uses consistent with the Mixed-Use Specific Plan district such as structured parking, office, retail, residential or additional civic uses may be permitted. However, under no circumstances shall the overall density of this district cause the overall Specific Plan Area to exceed the maximum densities provided in Tables 2-1, 2-2, 2-3, 2-4 and 2-5.

C. The City Manager or designee has the discretion to determine whether a land use not referenced above and herein may be permitted provided such use is consistent with the intent of the Specific Plan.

3.3.3 Civic Center: Development Standards

A Table 3-4 outlines the general Development Standards for the Civic Center.

Table 3-4: Civic Center Development Standards

Development Standard	Civic Center
A. Minimum Lot Size	15,000 sf
B. Maximum Building Height	45" ft. to roofline; 80' ft. to architectural feature.
C. Landscaping Required	Minimum 15% of the overall Civic Center designation (exclusive of areas in a public right-of-way) must be landscaped.
D. Parking Lot Landscaping	Minimum 5% of parking areas (exclusive of loading areas) must be landscaped. This landscaping may be

Development Standard	Civic Center
	counted toward the total site area landscaping required in item C above.
E. Minimum Street-Side Building Setbacks[1]	
♦ Peyton Drive	20' ft
♦ Boys Republic Drive	10' ft
♦ City Center	5' ft
♦ Shoppes Drive	10' ft.
♦ All other setbacks	0' ft.
F. Minimum Internal Street –Side Building Setbacks[1]	0' ft.

Abbreviations: sf = square feet; ft = feet

Notes:

[1] See Section 3.4.3.B. (below) for definition of a street-side building setback.

B. Street-Side Building Setbacks: A street-side building setback is the minimum distance required between any public right-of-way line and any part of a building or structure on the Civic Center site. No minimum setback between any private street and any part of a buildings or structure in the Civic Center site is required.

C. In addition to the standards outlined in Table 3-4, the following shall apply to all development projects proposed within the Civic Center designation:

1. Open storage of material and equipment permitted in the Civic Center shall be surrounded and screened by a solid wall or fence, including solid gates where necessary, not less than six feet in height. Materials shall not be stacked above the height of the screening.

2. Roof top areas of structures shall be shielded and screened from view from Peyton Drive by parapets or other finished architectural features.

3. Development adjacent to property zoned or designated residential shall have walls and landscaping approved by the City Manager or designee at the time of site plan review.

3.3.3.1 Parking and Loading

A. The Civic Center integrates a variety of government service uses with varying parking requirements, peak hour parking demands, and vehicle loading needs. Flexibility in meeting these varying requirements and demands is accommodated through inclusion of on-site parking and loading areas as part of the common area shared by occupants of the Civic Center designation. Access to and use of common area shared parking shall be maintained through real property agreements applicable to all facilities in the Civic Center

designation. In recognition of these circumstances, the requirements of Development Code Chapter 16.34, "Parking and Loading," are waived and the location of parking and loading facilities shall be as shown in Table 3-5 and the text below.

Table 3-5: Civic Center Parking Requirements

Use	Required Number of Spaces
City Hall	4/1,000 sf
Library	4/1,000 sf
Fire Department Facility	(a)
Sheriff's Substation	(a)

Abbreviations: sf = square feet
Notes:
(a) Parking standards to be determined and approved by the City Manager or designee.

B. Parking Facility Development Standards:

1. Parking space dimensions - The minimum size of a parking space shall be nine feet wide (9') and nineteen feet (19') long including the two foot (2') curb overhang, if applicable. The minimum size of a handicapped parking space shall be as directed by Title 24 of the California Code of regulations.

2. Parking access - The minimum width of a parking lot drive aisle shall be twelve feet (12') for one-way traffic. The minimum width of the non-fire access parking lot drive aisles located in the Civic Center shall be a minimum twenty-four feet (24'), and is subject to review and approval of the City Manager or designee.

3. All parking spaces and associated driveways shall be entirely paved with concrete or asphalt-type surfacing per City standards and requirements.

4. Pavement graphics, directional signs and arrows shall be provided on parking lot drive aisles.

5. Parking space delineation – All parking spaces shall be clearly marked with paint or another easily distinguishable material and all spaces shall be delineated with single or double lines.

C. Loading Space Requirements: Loading space requirements shall be subject to the requirement of Section 16.34.100, "Loading space requirements," of the Chino Hills Development Code. Deviations from Section 16.34.100 may be approved by the City Manager or designee at the time of site plan review.

D. Bicycle Parking Standards:

1. Bicycle parking/storage shall be a minimum of 5% of total auto parking requirement.

2. Bicycle parking standards shall be subject to the requirement of Section 16.34.110, titled "Bicycle parking standards," of the Chino Hills Development Code. Deviations from Section 16.34.110 may be approved by the City Manager or designee at the time of site plan review.

3.3.3.2 Signs

A. Signs within the Civic Center land use designation shall be subject to Chapter 16.38, titled "Signs," of the Chino Hills Development Code with the exception of the following:

B. Freeway Oriented Signs:

1. Along the Chino Valley Freeway (SR-71), a Pylon/Reader Board sign may be located on the Boys Republic Property as shown in Exhibit 4-11, *Pylon Sign Location.* The sign may be up to 100' feet tall and 40' feet wide and indicate "The Shoppes at Chino Hills," a project logo and/or icon, "City of Chino Hills," and the names of the tenants. Maximum sign area is 2,000 square feet per side. Letter height will be no more than 75" inches.

2. An electronic reader board may be included to identify upcoming cultural events and advertising for the project. The reader board is approximately 20' wide and 10' tall and will be incorporated into the Pylon Sign.

3. The Civic Center land use designation shall be exempt from Section 16.38.070, "Freeway-oriented signs," of the Chino Hills Development Code.

3.3.3.3 Walls and Fences

Walls, fences and hedges shall be subject to the requirements of Chapter 16.06.120, "Fences, walls and hedges," of the Development Code. Deviations from Chapter 16.06.120 may be approved by the City Manager or designee at the time of site plan review.

3.3.3.4 Additional Standards

For any development guideline not specifically addressed herein, the City of Chino Hills Development Code shall govern.

3.4 SHOPPES MIXED-USE REGULATIONS FOR DEVELOPMENT

3.4.1 Shoppes Mixed-Use: Designation Intent and Purpose

The intent of the Mixed-Use Land Use designation is to permit a variety of retail and commercial services, including but not limited to restaurants, offices, and hotel uses. Residential uses can be provided in the form of apartments, townhomes, condominiums, flats, lofts, live/work units, residential above retail commercial/office or free standing buildings. Innovative housing options, integration with commercial and office uses, and pedestrian-oriented design are encouraged. Exhibit 3-4 presents a conceptual site plan for the Shoppes Mixed-Use development. Exhibit 3-5 provides a conceptual elevation for the retail/residential component of Shoppes Mixed-Use development and Exhibit 3-6 provides an example of the elevations and building designs for the hotel and retail/residential components of the Shoppes Mixed-Use. Exhibits 3-7 through 3-10, Shoppes Mixed-Use Visual Study, illustrate consistency with the surrounding environment.

3.4.2 Shoppes Mixed-Use: Permitted Uses

In the Shoppes Mixed-Use designation, uses consistent with the Shoppes Mixed-Use land use district, such as structured parking, office, retail, hotel, residential or civic uses may be permitted. Higher density residential development in the form of apartments, townhomes, condominiums, flats, lofts and live/work units are permitted. However, under no circumstances shall the total square footage of development allowed within the Shoppes Mixed-Use land use designation exceed 40,000 square feet, 300 hotel rooms and 295 residential units. Permitted uses within the Shoppes Mixes-Use land use designation include:

A. Retail. Retail uses by way of example, sell any of the following products: Apparel, home decor, cooking, and dining ware, goods, jewelry, bedding and bathroom accessories, books and publications, gift shops, gardening accessories and decor, outdoor living/furnishings, sporting goods, children's toys, electronic goods. Specialty grocery stores and specialty food establishments that do not exceed 25,000 square feet are also permitted.

1. Retail uses shall provide a minimum 25,000 square feet of the total 40,000 square feet permitted within the Shoppes Mixed-Use. A minimum 10,000 square feet of this total retail shall be located directly in front of and adjacent to the City owned parking structure. See Section 3.4.3.2 for additional details on the retail uses to be located directly in front of or adjacent to the City owned parking structure.

2. A minimum 80% of the retail space shall be for retail use only. The remaining 20% of the retail space may be used for office use. The office

space uses shall be consistent with the office uses in the Shoppes Retail

3. The second floor space (if any) above the ground floor retail in the building in front of and adjacent to the City owned parking structure may be developed as 100% office space. Minimum parking standards established for the Shoppes Mixed-Use shall be maintained for such office use.

4. Due to the design and depth challenges associated with the Shoppes Retail, there shall be no minimum size retail tenant space within the Shoppes Mixed-Use.

B. Restaurants. Permitted restaurant uses include: Full service restaurants (including those with bars serving alcoholic beverages and including entertainment as accessory uses) ("full service restaurant" means an establishment that prepares and sells food to customers that order food while seated in the establishment and have the food delivered to them and consume the food on the premises of the establishment); take out restaurants that sell food to customers who order primarily at a counter or through call-in orders, and that allow food to be consumed on or off the premises of the restaurant but such restaurants shall not be permitted to sell food at drive-thru facilities.

C. Bar or night club. Bar or night club use is primarily an age restricted establishment and shall be permitted. This use shall not exceed, in aggregate, over 10,000 square feet.

D. Service uses. Professional office, professional service, or personal services on first floor and on second floor provided aggregate of service use is parked according to guidelines established therein. No automobile service or repair shall be allowed, including but not limited to service stations.

E. Hotel. A minimum of 100 hotel rooms and a maximum of 300 hotel rooms shall be permitted within the Shoppes Mixed-Use. An hotelier with multiple hotels and whose market area may be the local area or regional, national, or international markets are permitted. An hotelier with multiple locations typically employs a hotel format that is common among locations and shall be developed in accordance with Sections 3.4.3.4 and 3.4.4.

F. Residential. A minimum of 125 residential units and a maximum of 295 residential units shall be permitted within the Shoppes Mixed-Use. See Section 3.4.3.3 for additional details on the Shoppes Mixed-Use residential.

G. The sale of alcohol in grocery, supermarket and/or specialty retail stores (off-site sales) and in restaurants as an accessory use (on site sales) located anywhere within the Shoppes Mixed-Use land use designation is permitted. The sale of alcohol shall be subject to licensing by the State of California Department of Alcoholic Beverage Control.

H. Throughout the Shoppes Mixed-use, and to create an atmosphere that encourages pedestrian traffic and invites people to walk between uses, outdoor vendors are permitted as an accessory use. While the vendors' cart or kiosk may appear to be temporary in nature, they shall be designed to complement the architectural style of the other buildings on site and integrated into the site design to provide for easy pedestrian access. The size and location of vendor carts shall be limited as determined by the Shoppes Mixed-Use management in order to ensure that business is oriented to the pedestrian and not surrounding streets and to provide for adequate pedestrian circulation around the use.

I. Due to the unique nature and specialty uses of the Shoppes Mixed-Use Development Code Section 16.12.020, "Permitted uses, accessory uses, temporary uses and conditional uses" including Appendix A, "Regulation of Uses by Zoning District" shall not apply to the Shoppes Mixed-Use land use designation.

3.4.3 Shoppes Mixed-Use: Development Standards

Table 3-6 outlines the general Development Standards for the Shoppes Mixed-Use land use designation.

Table 3-6: Shoppes Mixed-Use Development Standards

Development Standard	Shoppes Mixed-Use		
A. Minimum Project Area	5,000 sf		
B. Minimum Lot Width	None Required		
C. Minimum Lot Depth	None Required		
D. Maximum Floor Area Ratio[1]:			
♦ Commercial/Retail/Office	2.00		
♦ Hotel(s)	1.75		
♦ Residential	2.25		
E. Maximum Density/Intensity:			
♦ Commercial/Retail/Office[2]	40,000 sf		
♦ Hotel(s)	300 rooms Up to		
♦ Residential	295 du[3]		
F. Maximum Building Height[4]			
♦ Commercial/Retail/Office[5]	50' ft. to roofline; 80' ft. to architectural feature		
♦ Hotel(s)	80' ft to roofline; 85' ft to architectural feature		
♦ Residential/Mixed-Use Buildings[6]	70' ft. to roofline; 80' ft to architectural feature		
G. Minimum Street–Side Building Setbacks[7]:	Front	Side	Rear
♦ Boys Republic Drive	10' ft	10' ft	n/a
♦ City Center Drive	10' ft	10' ft	n/a
♦ Shoppes Drive	10' ft	10' ft	n/a
♦ Other Private Streets/Driveway[8]	10' ft	10' ft	5' ft
H. Residential Common Open Space[9]:	None Required		

Development Standard	Shoppes Mixed-Use
♦ Minimum Area per Unit ♦ Minimum Dimension	None Required
I. Residential Private Open Space[9]: ♦ Minimum Area per Unit ♦ Minimum Dimension	 None Required None Required
J. Minimum Required Building Separation[10]: ♦ Front of Building to Front of Building ♦ Front of Building to Side of Building ♦ Side of Building to Side of Building	 30' ft 20' ft 10' ft
K. Required Landscaping ♦ Commercial/Retail/Office ♦ Hotel(s) ♦ Residential ♦ Street Frontage	None Required Minimum 10% (may include planted areas, enhanced hardscape, parking and open space) None Required Must be consistent with Shoppes Retail

Abbreviations: sf = square feet, ft =a feet, ac = acre, du = dwelling unit, N/A = not applicable

Notes:

[1] Density of use shall not exceed the amount stated per parcel. If there are multiple uses on a parcel, then each use shall not exceed the amount indicated on each parcel (Does not apply to condominium units).

[2] Does not include hotel square footage or accessory residential uses.

[3] Should the Shoppes Mixed-Use designation area develop at less than the allocated units, the remainder units may be located elsewhere within the Specific Plan area, subject to City Manager or designee approval. This provision does not include amenity areas, leasing and administrative areas, and recreational areas associated with the project.

[4] Antennas as defined in the Chino Hills Development Code are exempt from maximum height restrictions.

[5] Maximum height requirement applies to free-standing retail buildings

[6] Maximum height requirement includes residential above retail/office (mixed-use) buildings

[7] See Section 3.4.3.1 below for definition of a street-side building setback. All setbacks are measures from center line of street unless noted otherwise

[8] Private street/driveway setbacks measured from the centerline of the private street or driveway.

[9] Residential uses shall have common private space and at a minimum will include a pool/spa area (see Section 4.7).

[10] Applies only to buildings on separate parcels. Does not apply to the distance between a building, a parking structure, or to condominium units.

3.4.3.1 Street-Side Building Setbacks

A street-side building setback is the minimum distance required between the curb face of the indicated street and any part of a building or structure on the Shoppes Mixed-Use site.

3.4.3.2 Retail Buildings in Front of and adjacent to City Owned Parking Structure

A. Minimum building height – A minimum of 22' ft. to top of parapet, tower or architectural feature,

B. Maximum building height: A maximum of 48' ft. to top of parapet, tower, or architectural feature.

C. Architectural elements – An architectural tower element that provides 360 degree architecture shall be located on the north and south end of the building as a way of defining each of the corners of the building. These architectural elements shall be constructed in order to achieve a minimum of 12' feet in height above the minimum building height for a minimum height of 34' feet unless otherwise approved by the City Manager or designee. All architectural tower elements shall provide 360 degree architecture to avoid a fake or false facade or front, similar to corners of buildings within the Shoppes Retail.

D. Storefront glazing – The southern end of the building fronting City Center Drive shall be finished with storefront glazing consistent with the Shoppes Retail and also utilize areas above the storefront for internal illumination.

3.4.3.3 Shoppes Mixed-Use: Residential

A. Residential Unit Size – The residential component of the Shoppes Mixed-Use will include urban and innovative housing options and may be integrated with commercial, retail and office uses. Therefore, unit sizes may differ from the Section 16.10.040(A) of the Chino Hills Development Code. In such case, section 16.10.040(A) shall be waived.

B. Common Open Space Amenities - The residential component in the Shoppes Mixed Use will allow for private amenities that may be accessed and used by residents and their guests only and, at a minimum, will include a pool/spa, bbq area and meeting/activity room.

C. Private Open Space – Due to the urban nature of the residential units, balconies and/or patios may not be provided for every residential unit. However, where possible, the use of balconies and patio areas are encouraged to provide architectural relief and private open space throughout the project. Exhibit 3-11 provides examples of the type of balconies and patios that may be used within the residential component of the Shoppes Mixed-Use.

D. Due to the conceptual nature of the residential portion of the Shoppes Mixed-Use, the residential developer shall undergo formal site plan review and obtain approval from the Planning Commission for the final residential product and residential site plan. Site plans contained herein are for conceptual use only

3.4.3.4 Shoppes Mixed-Use: Hotel

A. Common Open Space Amenities - The hotel component in the Shoppes Mixed Use will allow for private amenities that may be accessed and used by hotel guests only and, at a minimum, will include a pool and business center.

B. Architecture – Consistent with Section 3.4.4 Shoppes Mixed-Use Architecture and Design, hotel operators that employ the use of prototypes that

are national or regional in use shall be deemed approved in meeting the Shoppes Mixed-Use Design Guidelines and shall not be subject to further review by the Planning Commission. However, a Site Development Permit (SDP, Staff Level Approval) is required prior to submittal of construction plans.

3.4.3.5 Entertainment Uses

Primary entertainment uses such as a bar or night club shall be subject to the provisions of Development Code Section 16.12.070, "Entertainment establishments providing dancing, music, and similar activities" require submittal of a security plan to the City for review and approval. For restaurants whose primary use is an eating establishment, no security plan shall be required unless a security plan is a condition of licensing by the Department of Alcoholic Beverage Control.

3.4.3.6 Outdoor Accessory Uses and Events

A. Periodic use of portions of City Center Drive within the Shoppes Mixed-Use designation for civic and promotional events shall be permitted. Those portions of the street that are privately owned may be closed on a temporary basis during such events, without City approval. Those portions of the street that are publicly owned may be closed on a temporary basis during such events with prior approval from the City. When approved by the City, the requirements of Development Code Section 16.40.050, "Special outdoor events," shall not apply.

1. Civic and promotional events on City Center Drive may include product displays, product promotions, and/or product demonstrations that shall be subject to restrictions imposed by common area property management and shall be exempt from Section 16.12.080, "Outdoor display and storage", of the Development Code provided such uses are consistent with the retail uses within the Shoppes Mixed-Use designation.

2. Outdoor storage shall not violate line of sight standards as outlined in Section 3.3.3.2 of this Specific Plan.

3. In order to create and enhance the Shoppes Mixed-Use ambiance, an outdoor sound system may be installed to provide background music and to serve as a public address system. Noise standards contained in Table N-1 "Noise/Land Compatibility Matrix" of the City of Chino Hills General Plan Noise Element shall apply and shall be used to define acceptable and unacceptable noise levels.

3.4.3.7 Trash Enclosures / Refuse Bins

A. Receptacles (bins) for the collection of refuse and recyclable materials generated within the Shoppes Retail designation shall be agreed upon with the City.

B. All trash enclosures shall be designed with a walk-in access component.

C. Enclosures shall be provided for bins and shall consist of six (6) foot-high (split face) block masonry walls finished to be consistent with the Shoppes Retail, and solid, view-obscuring gates with self-closing devices.

3.4.3.8 Walls and Fences

A. The maximum height of fences and walls, including retaining walls within the building setback, shall be a maximum of six feet (6') in height Location and design of a wall or fence is subject to review and approval by the City Manager or designee. Development Code Section 16.06.120, Subsections B, C, and D titled, "Fences, walls and hedges," shall not apply to the Shoppes Mixed-Use designation.

B. All walls shall be made of high-quality, split face block or pre-cast concrete and include a decorative cap or if not those materials then as approved by the City Manager or designee.

C. There are active outdoor use areas, such as restaurants with outdoor eating areas, associated with the Shoppes Mixed-Use designation. Due to the proximity of these areas to City Center Drive, these outdoor active use areas would be exposed to traffic noise levels. Sound barriers will not be required for affected buildings and eating areas.

3.4.3.9 Parking

A. The Shoppes Mixed Use integrates a variety of retail goods and services, office and residential uses with varying parking requirements, peak hour parking demands, and vehicle loading needs. Flexibility in meeting these varying requirements and demands is accommodated through inclusion of on-site parking and loading areas as part of the common area shared by tenants, occupants and residents of the Shoppes Mixed Use. Further, shared parking between parcels is acceptable and may be authorized pursuant to a shared parking study and agreement, approved by the City Manager or designee. To the extent there is ambiguity or parking is short, a reduction in the number of residential units may be necessary. Under no circumstance shall there be a reduction in the minimum amount of retail space or minimum number of hotel rooms to meet shared parking requirements.

In recognition of these circumstances, the Shoppes Retail parking requirements shall supercede the requirements of Development Code Section 16.34.060, "Number of parking spaces," and Section 16.34.050, Location of parking and loading facilities." Table 3-7 shows the number of spaces shall be as described in the text below.

Table 3-7: Shoppes Mixed-Use Parking Requirements

Use	Number of Spaces Required	Number of Unassigned Guest Spaces
Hotel		
• Hotel Room	1 space per hotel room[1]	N/A
• Meeting Space/Dining	Minimum 3.25 spaces/ 1000 SF-GLA[2]	N/A
Commercial/Retail/Restaurant/Office	Minimum 3.25 spaces/ 1000 SF-GLA[2]	N/A
Residential: Condominium and Multi-Family		
• Studio (10 units or less)	1.0	.25 per unit
• Studio (For each additional unit above 10 units)	1.25	.25 per unit
• 1 Bedroom	1.5	.25 per unit
• 2 Bedroom	2.0	.25 per unit
• 3 Bedroom	2.0	.25 per unit

Abbreviations: SF = Square feet, GLA = Gross Leasable Area

Notes:

[1] Hotel parking requirements includes handicap parking spaces and includes employee parking.

[2] Gross Leasable Area (GLA) shall be defined as the total space designed for exclusive use of the tenant and generally excludes common area and space devoted to heating, cooling, and other equipment of the building, including shafts or structural members.

B. Shared Parking - Shared parking between parcels is acceptable and may be authorized pursuant to a shared parking study and agreement, approved by the City Manager or designee.

1. If shared parking is required, a reduction in the minimum number of residential units (175 units) may be necessary and is allowed. Under no circumstance shall there be a reduction in the minimum amount of retail space or minimum number of hotel rooms to meet shared parking requirements.

2. A portion of the retail parking may be shared with residential visitor parking as outlined in a shared parking study and approved by the City Manager or designee.

C. Parking Facility Development Standards:

1. Parking access – Vehicular access leading to parking facilities, including private parking structures or garages for private residences, shall have a minimum width of ten feet (10') for one-way traffic, and a minimum width of twenty feet (20') for two-way traffic. Greater widths may be required to meet Fire Department Codes. Pavement graphics, directional signs and arrows shall be provided.

2. Parking space dimensions - The minimum size of a parking space along City Center Drive shall be nine feet wide (9') and nineteen feet (19') long. The minimum size of a handicapped parking space shall be as directed by Title 24 of the California Code of regulations. If the minimum size of a parking space in a parking garage varies from the aforementioned dimensions, the variation must be agreed upon by City Manager or his/her designee.

3. Parking space delineation – All parking spaces shall be clearly marked with paint or another easily distinguishable material and all spaces shall be delineated with single or double lines.

4. All parking spaces and associated driveways shall be entirely paved with concrete or asphalt-type surfacing per City standards and requirements.

5. All signage, pavement graphics, directional signs and arrows shall be provided on parking lot drive aisles, consistent with the Shoppes Retail.

D. Metered Parking – Metered parking may be provided along City Center Drive and be designed and constructed to be consistent with Shoppes Retail. Parking meters shall be patrolled by the City of Chino Hills. Consistent with Section 3.4.3.9, metered parking spaces along City Center Drive shall be applied toward meeting the parking requirements within the Shoppes Mixed-Use district.

E. Valet Parking – Valet parking shall be permissible within the Shoppes Mixed-Use designation for residential, restaurants, retailers and hotels.

1. Valet parking may be provided anywhere on-site by Shoppes Mixed-Use management.

2. Valet parking operation should not unduly affect the availability of on-street parking spaces along City Center Drive.

3. The proposed traffic flow and location of the valet station or stations should not create undue traffic congestion in the area proposed for the valet service

F. Bicycle Parking Standards:

1. An area designated for three (3) bicycle parking spaces shall be located in one, area/location within the Shoppes Mixed-Use designation.

2. The Shoppes Mixed-Use designation shall be exempt from Section 16.34.110, "Bicycle parking standards", of the Chino Hills Development Code.

3.4.3.10 Trip Reduction Program

The Shoppes Mixed-Use designation shall be exempt from Section 16.36, "Trip Reduction Program", of the Chino Hills Development Code.

3.4.3.11 Minor Site Plan Changes

Changes to the Shoppes Mixed-Use site plan, illustrated in Exhibit 3-4, *Shoppes Mixed-Use Conceptual Site Plan*, are subject to approval by the City Manager or designee. However, the Shoppes Mixed-Use must maintain the urban character and form of the Shoppes Retail, Civic Center and Shoppes Mixed-Use site.

3.4.4 Shoppes Mixed-Use: Architecture and Design

A. The architecture of the Shoppes Mixed-Use is an eclectic blend of designs distinguishing each use from every other on the site while reinforcing the unique image and product or service of each. While encouraging uniqueness among tenants, design guidelines for the Shoppes Mixed-Use recognize the value of brand recognition for retailers and hoteliers with multiple locations. A retailer or hotelier with multiple stores/restaurants/hotels typically employs a format that is common among locations and may include standardized signs, architecture, design, interior and exterior colors, forms, shapes, materials, and the display of standardized logos to promote and enhance the company's image, products or services. Multiple store retailers and hoteliers include those whose market areas may be the local area or regional, national, or international markets. Accordingly, each tenant that is part of a multiple location retail, restaurant or lodging organization shall be permitted to construct and improve premises at the Shoppes Mixed-Use that are consistent with that company's retail, restaurant or lodging prototype format, including but not limited to, standardized signs, architecture, design, interior and exterior colors, forms, shapes, and materials, and the display of standardized logos, sign text, script, color, outdoor eating areas and patios, awnings and text thereon, lighting, and landscaping and shall not be subject to City review and without restriction or condition except as to size, bulk, height, or location restrictions applicable throughout the Shoppes Mixed-Use. In addition, the architecture of the brand retailers and hotels shall be upscale and consistent with the architecture and design of the Shoppes Retail.

B. Additional details on the design and architecture of the Shoppes Mixed-Use can be found in Section 4, *Design Guidelines*.

3.4.5 Shoppes Mixed-Use: Landscaping and Lighting

A. Landscaping within the Shoppes Mixed-Use is an essential element in creating a contiguous environment with the Shoppes Retail. The location, design and detail of the landscaping and lighting shall be consistent and compatible with and reflect the spirit and quality of the Specific Plan objectives and, in particular, the Shoppes Retail. In recognition of these

circumstances, the landscape and lighting requirements of the City of Chino Hills Landscaping and Lighting Manual, 1992 and the Chino Hills Municipal Code are waived and shall not apply to the Shoppes Mixed-Use designation. All landscaping and lighting shall be subject to approval by the City Manager or designee.

B. Landscaping shall be used to tie together the Shoppes Retail and the Shoppes Mixed-Use and look as though the two districts were designed and developed as one project. To accomplish this goal, similar design, palette and sizing of landscape shall be provided along City Center Drive.B. Pedestrian hardscape, similar to what is illustrated on Exhibit 4-8, *Shoppes Retail Conceptual Landscape Plan*, such as walkways and plaza/patio areas shall be enhanced. Enhanced paving will generally be located along the storefront walkways of City Center Drive, primary pedestrian crosswalks, and at the Shoppes Drive and City Center Drive intersection and Boys Republic and City Center intersection. Enhanced paving shall be defined by the following materials:

1. Integral colored concrete with saw cut pattern including sandblast or acid wash finish;

2. Concrete interlocking paving units with accent bands;

3. Natural grey concrete with saw cut pattern including a sandblast or acid wash finish with paver accents or borders;

4. Any combination of the above materials, pattern and finishes.

C. Standard pedestrian paving will be permitted only along the rear of the retail buildings where tenant service doors and loading activities are to take place or at other areas of secondary pedestrian access not affiliated with the retail storefronts. Standard pedestrian paving shall be defined by natural grey concrete with saw cut pattern including a sandblast or acid wash finish with paver accents or borders.

D. Exterior lighting shall be energy-efficient and shielded or recessed so that direct glare and reflections are contained within the boundaries of the Shoppes Retail and Shoppes Mixed-Use districts, and shall be directed downward and away from adjoining properties and public rights-of-way. No lighting shall blink, flash, or be of unusually high intensity or brightness. All lighting fixtures shall be appropriate in scale, intensity, and height to the use it is serving. Parking lot lights shall not exceed forty (40') in height. Lighting of outdoor areas shall be designed and maintained in a manner to prevent glare or direct illumination from intruding into off-site areas.

E. Additional details on the landscape of the Shoppes Mixed-Use can be found in Section 4.11 and 4.12.

3.4.6 Shoppes Mixed-Use: Signs

A. Tenant Signs: Tenant signs including standardized and logo signs of retailers with multiple store locations shall be permitted subject to size, height, bulk, and location regulations and subject to City Manager or designee review and approval of a sign program. Pending City approval of said sign program, such tenant signs are to be consistent throughout the Shoppes Mixed-Use and tenants shall be allowed to install and maintain tenant brand, logo, and/or prototype signage advertising the names and logos of their uses within the development.

B. Pylon/Reader Board – With written approval from the Shoppes Retail owner, tenants located within the Shoppes Mixed-Use district may be allowed to advertise on the Pylon/Reader Board discussed in Section 3.2.3.9 (C) of this Specific Plan and the Shoppes Mixed-Use shall be exempt from Section 16.38.070 "Freeway-Oriented Signs" of the Chino Hills Development Code.

C. Major Site Identity Monument - With written approval from the Shoppes Retail owner, tenants located within the Shoppes Mixed-Use district may advertise on the Major Site Identity Monument discussed in Section 4.13.3 of this Specific Plan.

D. Residential Leasing/Identification Signs – Signs establishing the leasing of residential units shall be permitted throughout the Shoppes Mixed-Use district. The final design and location of such signage shall be subject to Community Development Director or designee approval. An identification sign identifying the name of the residential project at the major intersections of Boys Republic Drive and Shoppes Drive shall be permitted. The name of the residential project shall be approved per City Manager or designee.

E. Hotel(s) Signs – The hotel(s) shall be permitted to have building top/wall signage consistent with the name of the hotel chain, subject to approval as to height of such lettering by the City Manager or designee. In addition, the hotel(s) shall be entitled to a monument sign along Boys Republic Drive. The actual design and location of such sign shall be approved by the Community Development Director or designee.

F. Additional details on the Specific Plan signage program can be found in Section 4, *Design Guidelines*.

3.4.7 Additional Standards

For any development standard not specifically addressed herein, the City of Chino Hills Development Code shall govern.



NOTE: LOCATION OF BUILDINGS AND USES WILL BE GENERALLY AS SHOWN

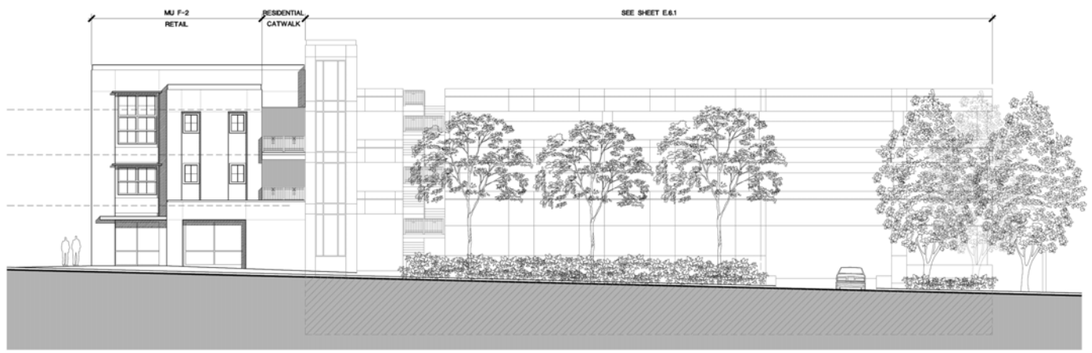
The Shoppes Mixed-Use
Conceptual Site Plan
Exhibit 3-4

[This page intentionally left blank]

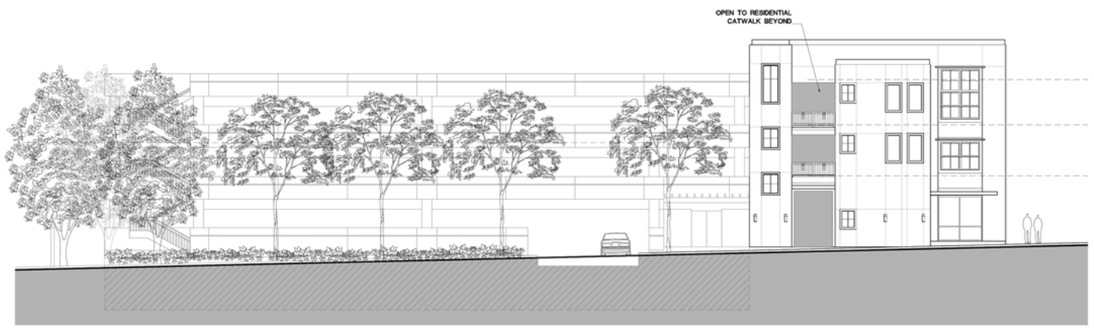


FRONT ELEVATION

- A FLAT ROOF WITH PARAPET WALLS, TYP.
- B EXTERIOR CEMENT PLASTER ICI COLOR "IVORY CREAM"
- C EXTERIOR CEMENT PLASTER ICI COLOR "BRICK ROAD"
- D METAL AWNING WITH STEEL CABLES PPG EXTRUSION COATING "UC51713XL"
- E STOREFRONT GLAZING PPG ATLANTICA FLOAT GLASS
- F GLAZING PPG SOLARCOOL AZURLITE
- G DECORATIVE METAL RAILING, PAINT TO MATCH AWNING
- H DECORATIVE LIGHT FIXTURE
- I CANVAS AWNINGS WITH TUBE STEEL SUPPORT



SIDE ELEVATION



SIDE ELEVATION

The Shoppes Mixed-Use
Conceptual Elevations
Exhibit 3-5

[This page intentionally left blank]







Hotel Examples





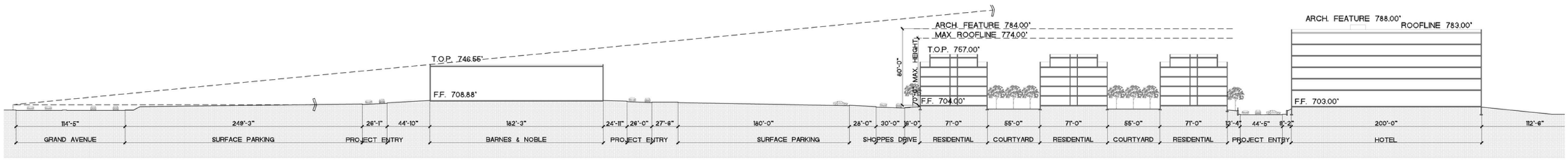




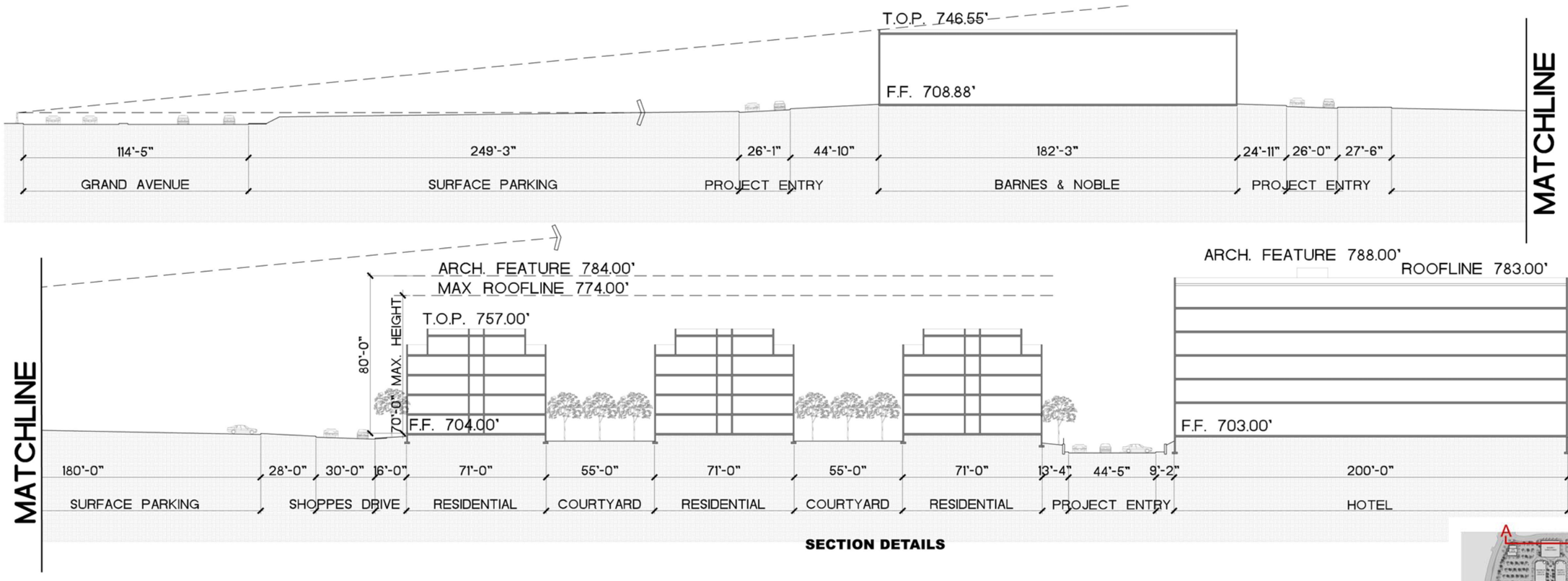
Residential Examples

The Shoppes Mixed-Use
Elevation and Building Design Examples
Exhibit 3-6

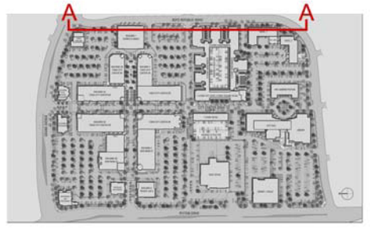
[This page intentionally left blank]



SECTION THROUGH BOYS REPUBLIC DRIVE LOOKING EAST



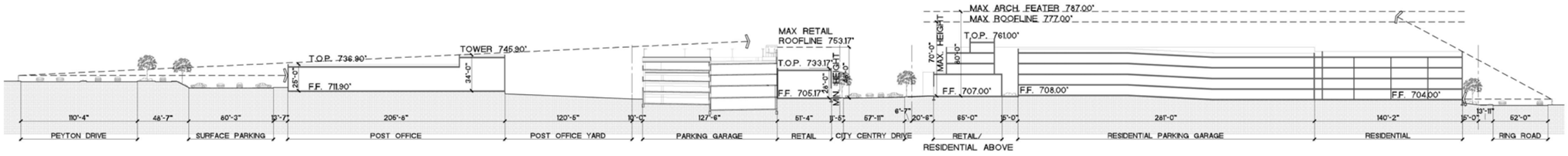
SECTION DETAILS



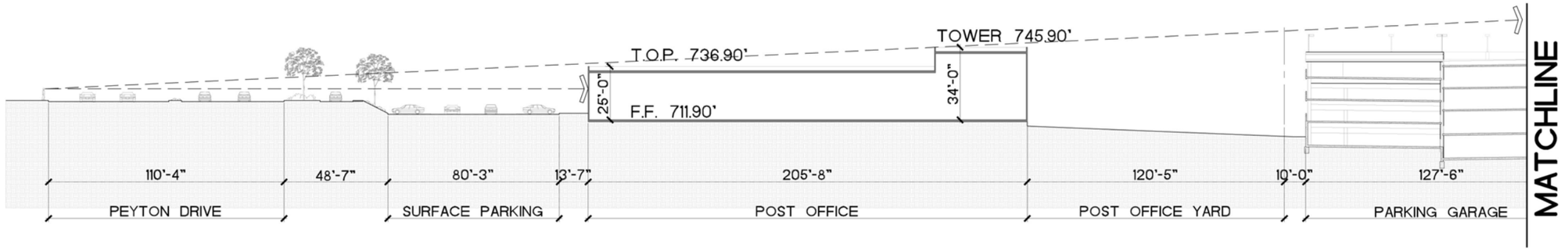
The Shoppes Mixed-Use Visual Study "A"
Exhibit 3-7

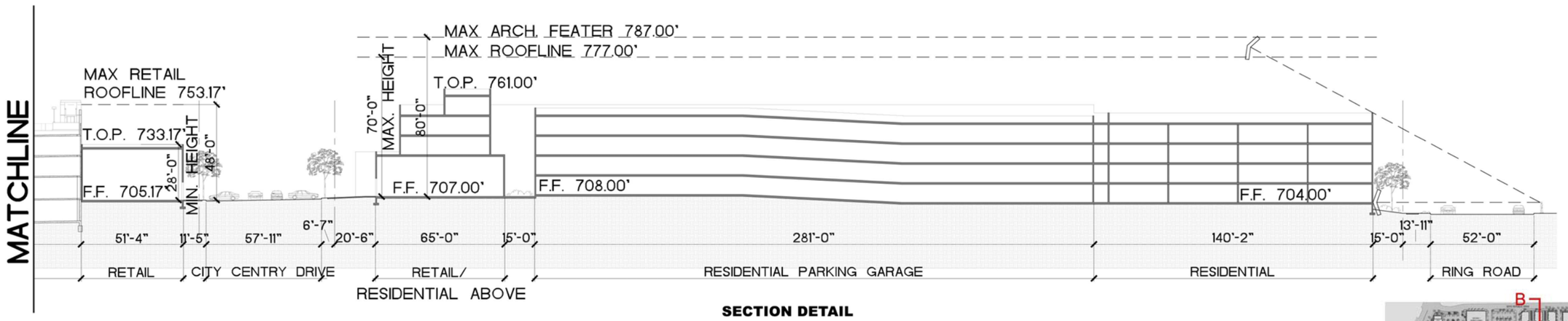
Not to Scale

[This page intentionally left blank]

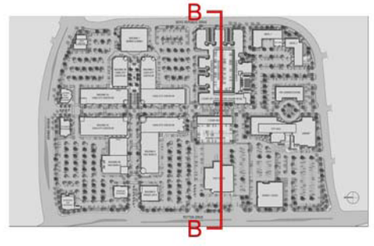


SECTION THROUGH SHOPPES MIXED-USE (RETAIL & RESIDENTIAL) LOOKING NORTH





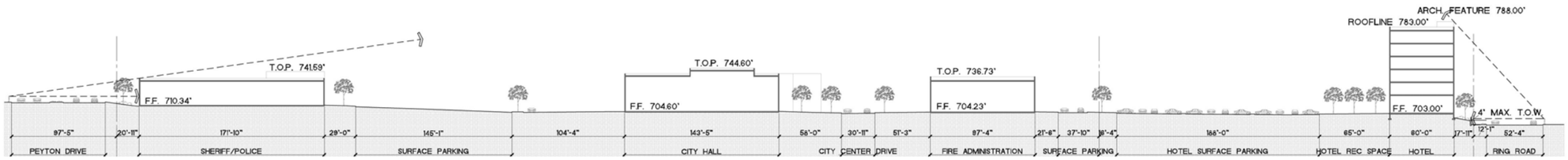
SECTION DETAIL



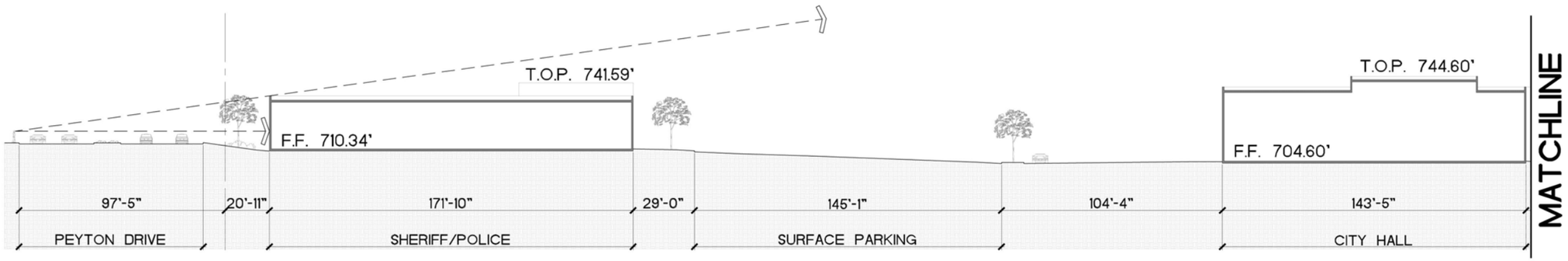
The Shoppes Mixed-Use Visual Study "B"
Exhibit 3-8

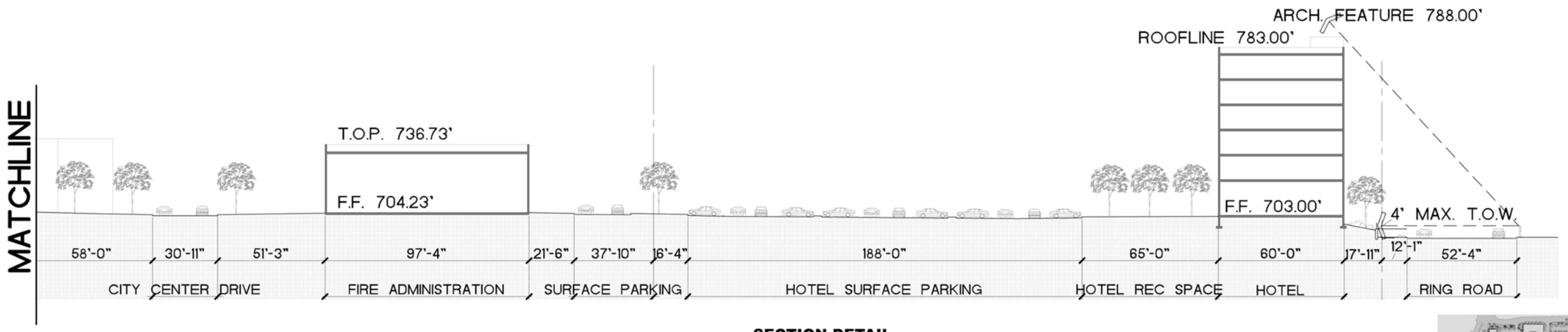
Not to Scale

[This page intentionally left blank]

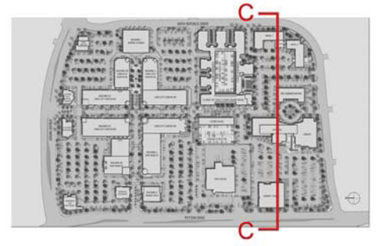


SECTION THROUGH SHOPPES MIXED-USE AND CIVIC CENTER LOOKING NORTH





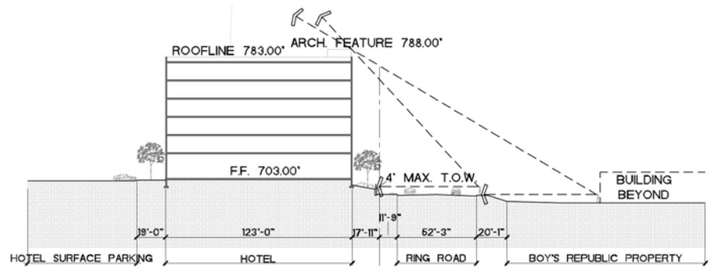
SECTION DETAIL



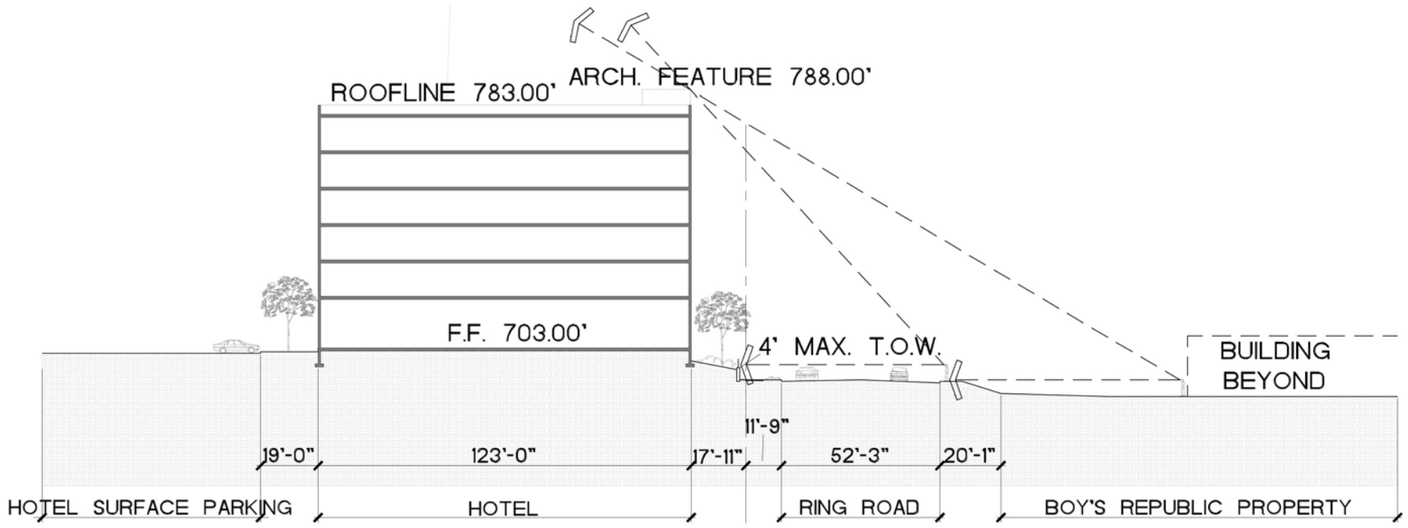
The Shoppes Mixed-Use Visual Study "C"
Exhibit 3-9

Not to Scale

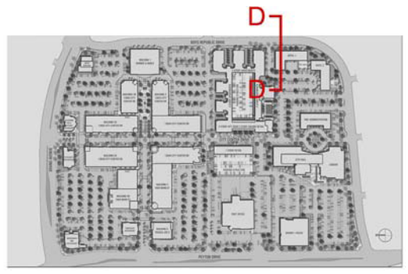
[This page intentionally left blank]



OVERALL SECTION THROUGH SHOPPES MIXED-USE (HOTEL)
LOOKING NORTH



SECTION DETAIL



The Shoppes Mixed-Use Visual Study "D"
Exhibit 3-10

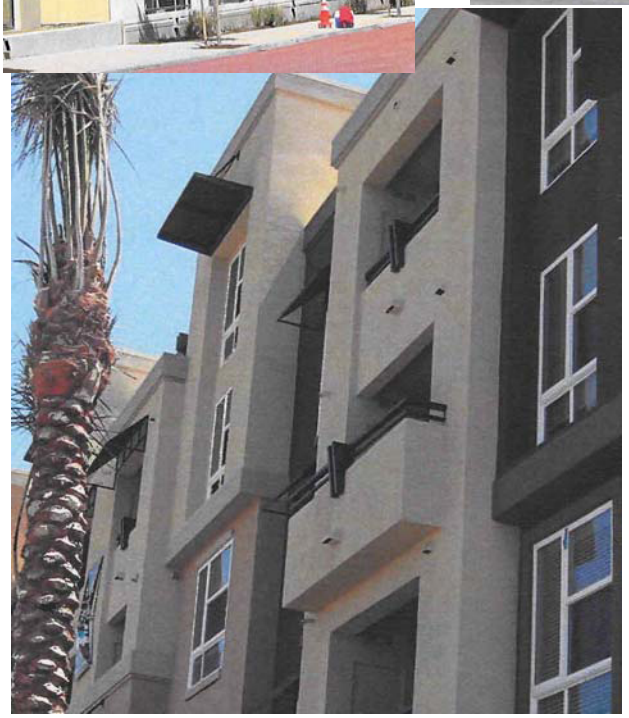
Not to Scale

[This page intentionally left blank]











Examples of Residential Balconies
Exhibit 3-11

[This page intentionally left blank]

3.5 COMMUNITY CENTER REGULATIONS FOR DEVELOPMENT

3.5.1 Community Center: Designation Intent and Purpose

The Community Center Land Use designation provides for a 19,000± sf Community Center. Exhibits 3-12 presents a conceptual site plan for the Community Center development.

3.5.2 Community Center: Permitted Uses

A. Permitted uses within the Community Center land use designation may include a recreational community center and passive park component.

3.5.2.1 Parking

The location of parking and loading facilities for the Community Center shall be generally shown on Exhibit 3-12, Community *Center Conceptual Site Plan,* and in Table 3-9 and the text below.

Table 3-9: Community Center Parking Requirements

Use	Required Number of Spaces
Community Center'	4/1000 sf

Abbreviations: sf = square feet

Notes:

If the calculation of required parking spaces results in a fractional number, that number shall be rounded up to the next whole numbered parking space.

Parking standards shall be approved by the City Manager or designee.

A. Parking Facility Development Standards:

6. Parking space dimensions - The minimum size of a parking space shall be nine feet wide (9') and nineteen feet (19') long. The minimum size of a handicapped parking space shall be as directed by Title 24 of the California Code of regulations.

1. Parking space delineation - All parking spaces shall be clearly marked with paint or another easily distinguishable material and all spaces shall be delineated with single or double lines.

2. All parking spaces and associated driveways shall be entirely paved with concrete or asphalt-type surfacing per City standards and requirements.

1. Pavement graphics, directional signs and arrows shall be provided on parking lot drive aisles.

B. Bicycle Parking Standards - The total number of bicycle parking spaces shall be a minimum of 5% of the total parking spaces provided.

3.5.2.2 Wall and Fences

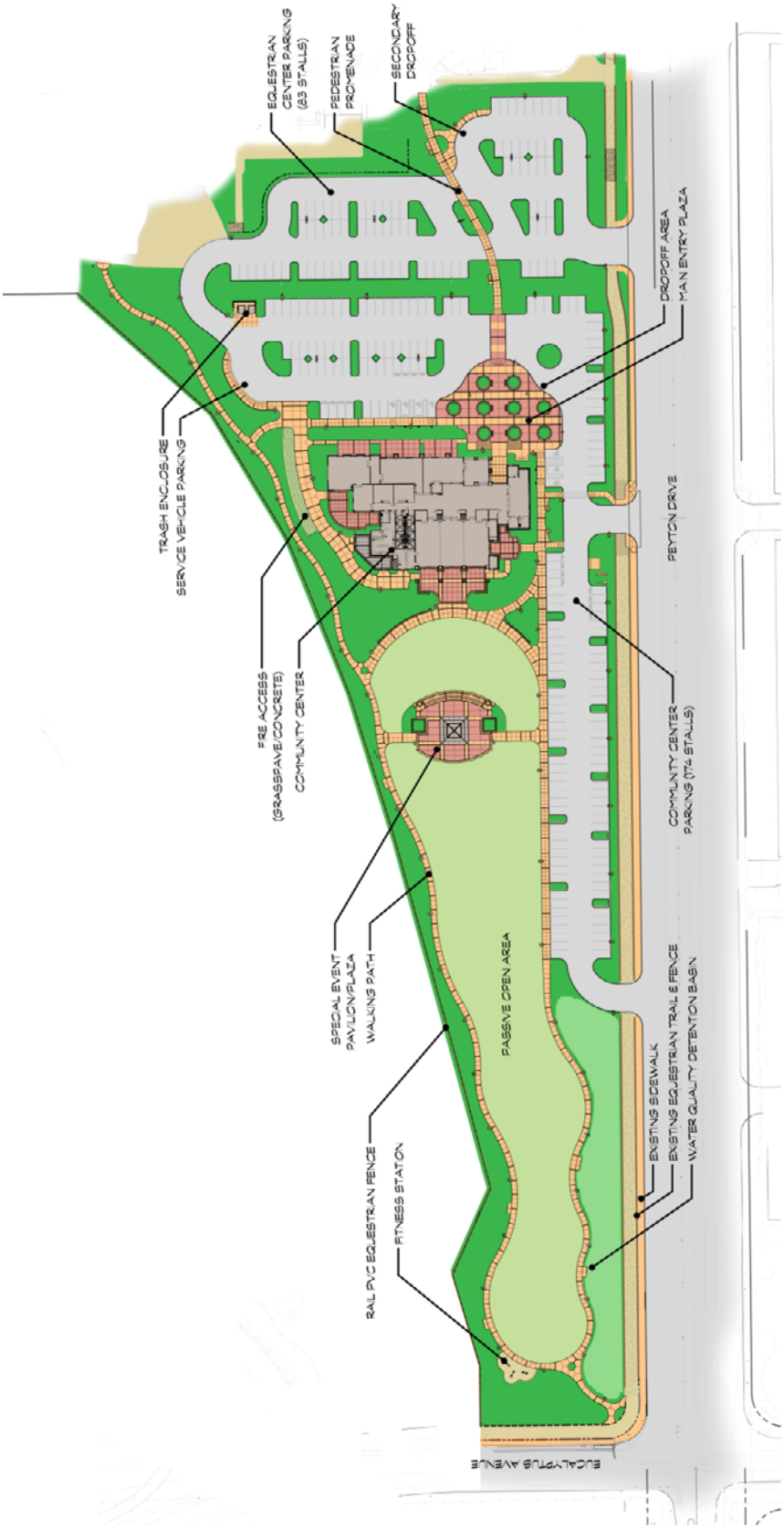
Walls, fences and hedges shall be subject to the requirements of Chapter 16.06.120, ""Walls, fences and hedges," of the Development Code. Deviations from Chapter 16.06.120 may be approved by the City Manager or designee at the time of site plan review.

3.5.2.3 Minor Site Plan Changes

Changes to the Community Center site plan, shown in Exhibit 3-12, *Community Center Conceptual Site* Plan, are subject to approval by the City Manager or designee. Changes may not be made to minimum setbacks or maximum heights.

3.5.2.4 Additional Standards.

For any development standard not specifically addressed herein, the City of Chino Hills Development Code shall govern.



Community Center Conceptual Site Plan
Exhibit 3-12

Amended – September 2012

Not to Scale

[This page intentionally left blank]

3.6 COMMUNITY PARK REGULATIONS FOR DEVELOPMENT

3.6.1 Community Park: Designation Intent and Purpose

The Community Park land use district and designation is intended to allow for a wide variety of open space activities and opportunities for residents of Chino Hills. The Community Park is an important recreational open space and park asset to the community. The Community Park is approximately forty-three (43) acres in size and is intended to accommodate active, organized sports as well as other park uses. This park contains a minimum of six (6) sports fields. Exhibit 3-10 presents an illustrative conceptual site plan for the Community Park development.

3.6.2 Community Park: Permitted Uses

A. The Community Park district allows a variety of open space uses, ranging from active parks, equestrian facilities and wildlife preserves. Accessory uses may include game courts, sporting fields and other outdoor recreational uses.

3.6.3 Community Park: Development Standards

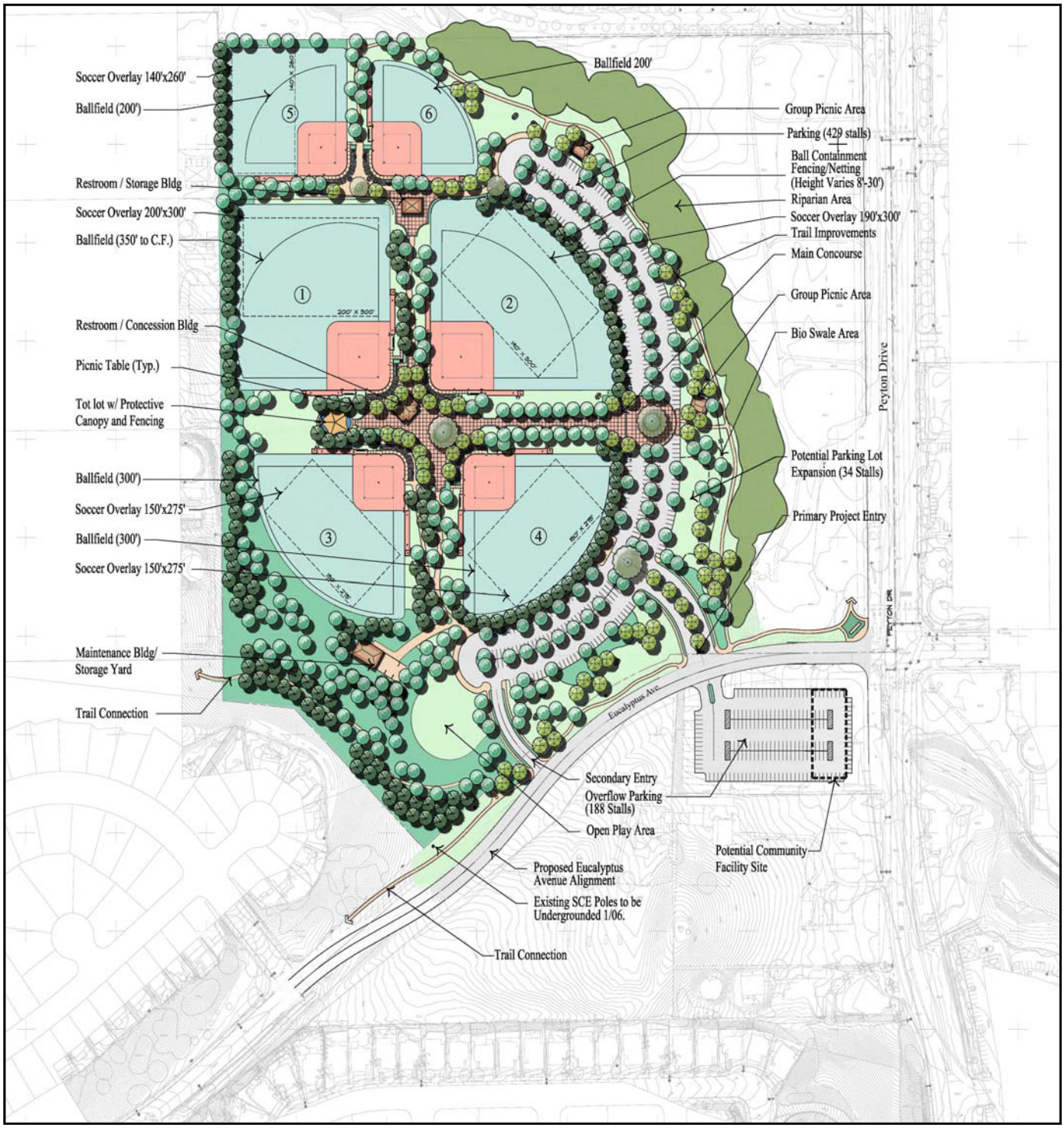
A. No specific development standards apply to public facility buildings constructed within public parks. Buildings shall be designed and constructed to reflect the character of the parks in which they are located and to ensure compatibility with surrounding development on adjacent properties.

B. For all development proposed within the Community Park district, building height, distance between buildings, and yard requirements shall be determined by the City Manager or designee.

3.6.3.1 Parking and Loading

Off-street parking and loading shall be subject to the requirements of Chapter 16.34, "Parking and loading," of the Chino Hills Development Code. Deviations from Chapter 16.34 may be approved by the City Manager or designee at the time of site plan review.

[This page intentionally left blank]



Community Park Conceptual Site Plan
Exhibit 3-16

Amended - November 2008

Not to Scale

[This page intentionally left blank]

4 DESIGN GUIDELINES

4.1 DESIGN GOALS

The Shoppes at Chino Hills Specific Plan area is the hub of the City in the form of a traditional downtown, civic center, and community park and is complemented by upscale multiple-family housing. The project is a source of civic pride. This mixed use development includes offices, retail shops, restaurants, hotels, as well as civic and residential uses.

The development plan for the Shoppes Retail, Civic Center and Shoppes Mixed-Use is based on a grid pattern of tree-lined streets oriented north-south and east-west. The pedestrian scale of the traditional "Main Street" is carefully blended with the modern demands for ease of access and adequate parking. Shaded sidewalks encourage people to walk among the various uses rather than drive. Pedestrian circulation is designed so that the development can be crossed by foot east to west in five minutes and north to south in seven minutes.

The designs of streetscapes, buildings, and landscaping within the Shoppes Retail, Civic Center, and Shoppes Mixed-Use reinforce the traditional downtown atmosphere and provide a vibrant, urban setting for those living, dining, working, relaxing, and shopping at the project. The development is a pedestrian-scaled venue of refined architectural expression rendered in high quality materials and finishes. The design guidelines in this section identify components important to the creation of this environment.

4.2 DESIGN CONTEXT

4.2.1 Shoppes Retail

The Shoppes Retail includes a department store, specialty retail shops, restaurants, and office uses. The Shoppes Retail component will combine modern retailing requirements for visibility, identity, ease of access and service, convenient parking and flexibility in leasing with the feel and scale of traditional "Main Street" shopping in order to create a successful retail center with a regional draw.

The Shoppes Retail is located along two tree-lined streets with angled, head-in parking at curbside. "Main Street" runs east-west and connects to Peyton Drive. "City Center Drive" runs north-south from Grand Avenue and connects the retail, restaurants and offices to the housing, civic buildings and library to the Boys Republic Drive to the south. Wide sidewalks adjoin the roadways.

The streetscape is comprised of one and two story buildings that provide an intimate, human-scaled space.

4.2.2 Civic Center

The Civic Center includes City Hall, the County library, the Police/Sheriff's substation, and the Chino Valley Fire District administration building. City Hall has frontage on City Center Drive. The County library and Fire administration facilities front on both City Center Drive and on the Boys Republic Drive. The Police/Sheriff substation has frontage on Peyton Drive. The Civic Center area is interconnected with the Shoppes Retail and the Shoppes Mixed-Use areas by pedestrian walkways and the grid-pattern street network. As in the Shoppes Retail area, the pedestrian-friendly scale is maintained.

While respecting and repeating the building massing and scale of the other uses within the Specific Plan area, the designs of Civic Center buildings suggest their unique roles within the community. The symbolic importance and the unique functions of the Civic Center are reflected in overall building forms and design. Unique shapes, massing, and fenestration are incorporated into the public gathering spaces of Civic Center buildings to accentuate their accessibility and their role in shaping community identity.

4.2.3 Shoppes Mixed-Use

Buildings are integrated within the overall plan and are buffered from arterial streets by the Shoppes Retail to the north and the Civic Center component to the west. The pedestrian-friendly environment of the Shoppes Retail is continued into the mixed-use area. For the residential component, attached units repeat the pattern of contiguous yet distinctive facades employed in the Retail component. Pedestrian-oriented city blocks are again formed by access roads and their intersections with driveways into parking areas. Some individual entries into the units maybe oriented toward the exterior street and adjoining sidewalks and others shall allow interior access from parking areas only.

4.2.4 Community Center

The Community Center is located adjacent to the Peyton Drive/Eucalyptus Avenue intersection. The configuration of the buildings, streets, parking, open space and landscaping balances the needs of the pedestrian and the automobile. Parking does not dominate the experience.

4.3 BUILDING FORM AND CHARACTER

The architecture for buildings comprising each of the land uses is a blend of building forms, massing, scale, and character that creates a pedestrian-oriented environment meant to be viewed and experienced on-foot rather than from the car. Examples of building design and form are shown in Exhibit 4-1.

Consistent with the overall character of the environment envisioned for the Specific Plan area, streetscape and building designs are guided by the following principles:

- Streetscape facades are comprised of a series of human-scaled wall segments, rather than monolithic wall expanses, to provide a comfortable and pleasant pedestrian experience;
- Articulation of building openings, roof, parapet and floor lines and changes in wall plane are used to provide visual interest and contrasts in light and shadow;
- Rooftop mechanical equipment is screened from view in a manner consistent with the architectural character of the building;

Particularly for the Shoppes Retail designation:

- Primary building entrances and display windows are oriented toward the street so as to support and encourage pedestrian activity;
- Diversity of architectural styles, quality materials and finishes, and variety of complementary colors is evident;
- Entryways are enhanced by means that include, but are not limited to, use of recessed doorways, inclusion of articulated lintels and pediments, incorporation of eaves, awnings, or canopies, and the use of doorway surround materials that contrast with those of major wall surfaces;
- Secondary building entrances and service doors will be oriented towards the rear of buildings, typically facing the main parking fields. The architecture will have similar articulation and materials to compliment the front streetscapes facades, but will be generally scaled back in design to delineate it from the primary pedestrian-oriented environment of the streets. A combination of tenant secondary entrance storefronts and single door service entrances may be provided along the rear elevations as determined by the Shoppes Retail operational needs and leasing requirements;
- For the comfort of pedestrians during hot weather, awnings, sunshades, or comparable assemblies project over sidewalks adjoining storefronts. Examples of canopies and sunshades are illustrated in Exhibit 4-2.





Varied Elevations





Varied Massing







Varied Colors



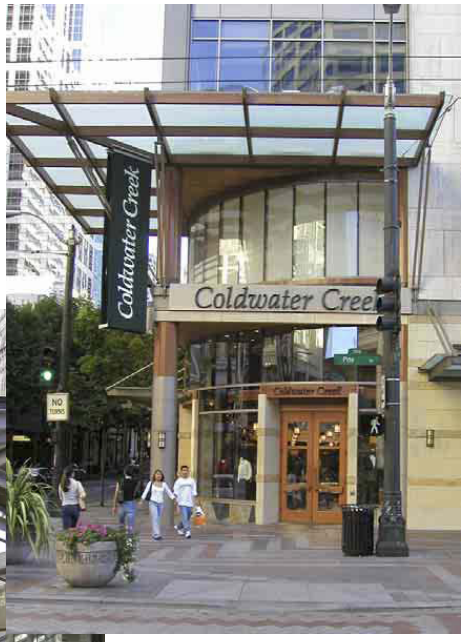




Building Design Examples
Exhibit 4-1

[This page intentionally left blank]





Fabric





Frosted Glass



Wood





Prefinished Metal



Canopies & Sunshade Examples
Exhibit 4-2

[This page intentionally left blank]

4.4 ENTRYWAYS

Enhanced entry features and landscaping are located at the major corners and entries to the Shoppes Retail, Civic Center, and the Residential Site. Elements such as water features, theme trees and/or enhanced landscape and paving are utilized. Exhibit 4-3 provides examples of corner and entry features.

4.5 PEDESTRIAN WALKWAYS

Walkways are located and configured so that pedestrians moving from parking spaces to buildings are separated from drive aisles to the maximum extent feasible. Entrances and parking lots will be configured to be functional and tied to logical destinations.

The walkways along Main Street and City Center Drive will feature adjoining landscaped areas to enhance the appearance of the walkway areas. Walkways along Main Street and City Center Drive will be readily distinguishable where they traverse drive aisles through the use of durable, low-maintenance surface materials such as pavers, brick scored concrete or similar architectural treatments.

4.6 OUTDOOR PUBLIC SPACES

Outdoor public spaces will offer attractive and inviting pedestrian scale features, spaces, and amenities such as:

- Patio/seating area;
- Pedestrian plaza with benches;
- Window shopping walkways;
- Kiosks;
- Amenities such as fountains, street furniture, bicycle racks, and bus shelters.

Examples of outdoor public spaces are provided in Exhibit 4-4.

4.7 PRIVATE SPACES

The residential component in the Shoppes Mixed Use and Park Residential will allow for private amenities that may be accessed and used by residents and their guests only. Potential amenities may include, but are not limited to:

- Balconies/Patio areas;
- Pools and spas;

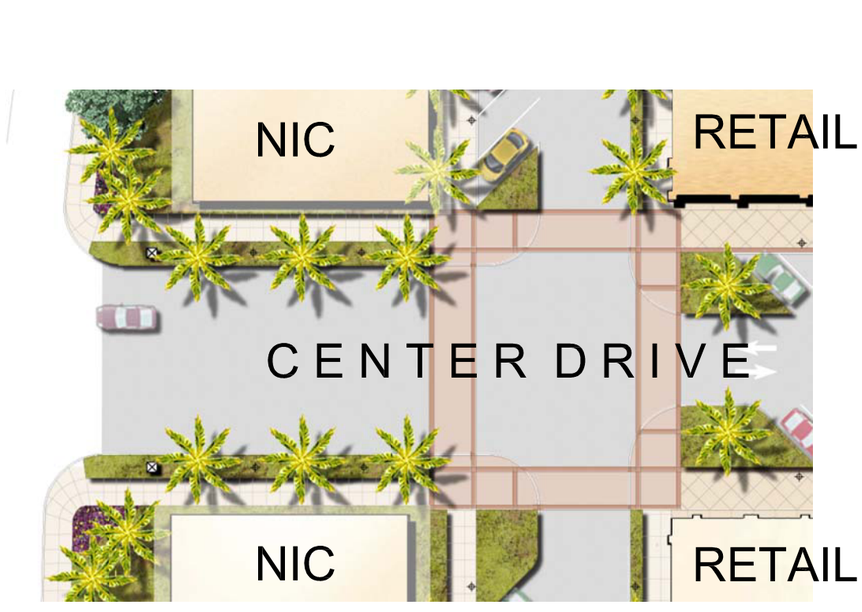
- Recreational areas;
- Game rooms;
- Food facilities;
- Classrooms;
- Cyber cafes; and
- Movie Theater areas.

In addition to the uses above, hotel and lodging uses may also include the following private spaces on site:

- Dining facilities;
- Bar or drinking establishment;
- Meetings rooms; and
- Onsite cleaning/Laundromat services.



CORNER OF GRAND AVENUE & PEYTON DRIVE



ENTRY OFF OF GRAND AVENUE

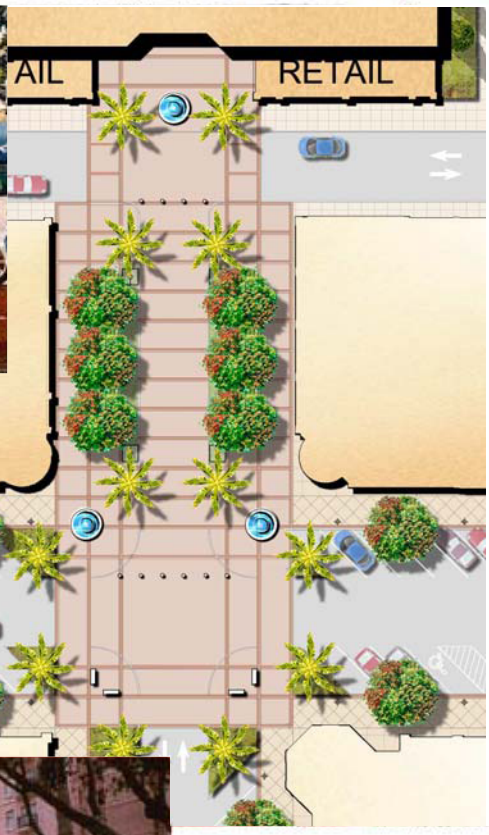


ENTRY OFF OF PEYTON DRIVE

Examples of Corner & Entry Features
Exhibit 4-3

[This page intentionally left blank]









Examples of Plazas







Various Amenities Within Plazas

Outdoor Public Space Examples
Exhibit 4-4

[This page intentionally left blank]

4.8 PEDESTRIAN AMENITIES

The Shoppes Retail and Shoppes Mixed-Use includes a variety of uses and tenants. As a destination location, many visitors are on-site for several hours and move between uses on foot. Special care is taken to furnish amenities for these pedestrians such as:

- Bench Seating
  Public seating allows the pedestrians to sit down, relax, and people watch.

- Trash and Ash Urns
  Trash receptacles and, where possible, recycling containers are provided as well as ash stands for extinguishing smoking materials.

- Seat Walls
  Retaining walls in outdoor public spaces may include integrated seating surfaces.

- Bicycle Racks
  Bicycle racks are located in well-lighted areas and placed in a location visible from entrances and/or parking areas.

- Drinking Fountains, Planting Pots, Saucers (moveable) and Planting Boxes
  These may be placed near public walkways without obstructing them.

- Entry Pylon
  Entry pylons provide an "entry experience"

- Parking Meters (street front spaces)
  The project includes metered "street parking" along Main Street and City Center Drive. The use of metered parking assures a continuous vehicle turnover at the street front. The meters will be of a color which compliments the architecture of the project. Parking meters will be enforced for security by the City of Chino Hills.

- Public Restrooms
  The Shoppes Retail will include one (1) set of public restrooms, location to be determined by the Shoppes Retail developer. Public restrooms may not be located within the Shoppes Mixed-Use.

Examples of public amenities are provided in Exhibits 4-5 and 4-6.

4.9 SITE LIGHTING

All site lighting is coordinated as to style, material, and color. Illumination patterns overlap, creating an even level of illumination throughout the parking area. Pedestrian level lighting is used along pedestrian walkways.

The use of diverse lighting types and methods ensure that the Specific Plan area's unique character is apparent during the day when the fixtures are plainly visible and at night when the fixtures illuminate the walks, buildings, landscaping, and parking. All lighting is located and aimed away from adjacent properties and roadways as consistent with City of Chino Hills lighting guidelines. All lighting fixtures shall be appropriate in scale, intensity, and height to the use it is serving. Parking lot lights shall not exceed forty feet (40') in height. Examples of project lighting are provided in Exhibit 4-7.

Basic lighting types include but are not limited to:

- Street pole lighting along principal circulation paths (sidewalks);
- Ground-mounted bollard lighting along pathways/parking areas;
- Decorative lighting fixtures integrated into/atop entry pylons/gates;
- Elevated pole lighting at parking lots;
- Below-grade uplights;
- Ground-mounted up lights to illuminate landscape, etc;
- Building up-lighting discreetly mounted above human eye points;
- Strung lighting cross paseos/terrace areas (including seasonal lighting).

4.10 EXTERIOR BUILDING MATERIALS

No one or single, exterior material or color scheme dominates the architecture of a street or open space in the project. Diversity and richness of architectural expression are achieved with a variety of material choices. Materials such as stucco, EIFS, stone, tile, enhanced concrete, metal, and glass are introduced in different façade treatments to ensure that no single material dominates the palette. Rich materials and warm vibrant colors are used.





Benches





Water Fountains

Trash Receptacles





Pots



Paving

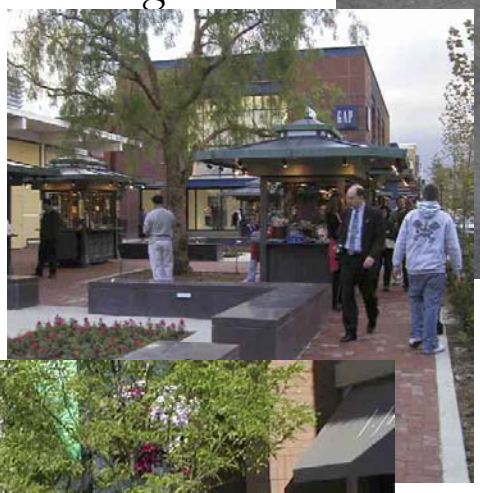
Pedestrian Amentites Examples
Exhibit 4-5

[This page intentionally left blank]



Water Fountain

Seating Walls

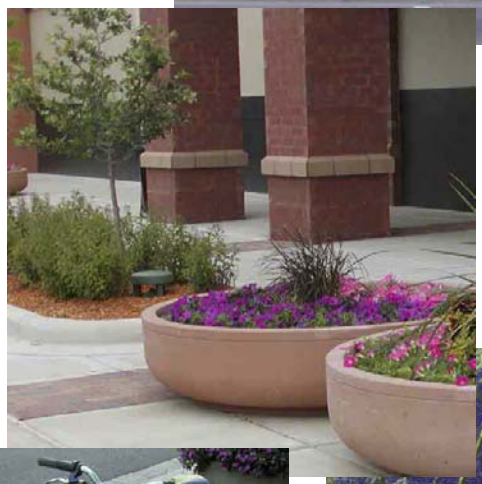


Parking Meter





At Grade Planter With Curb



Planting Pots





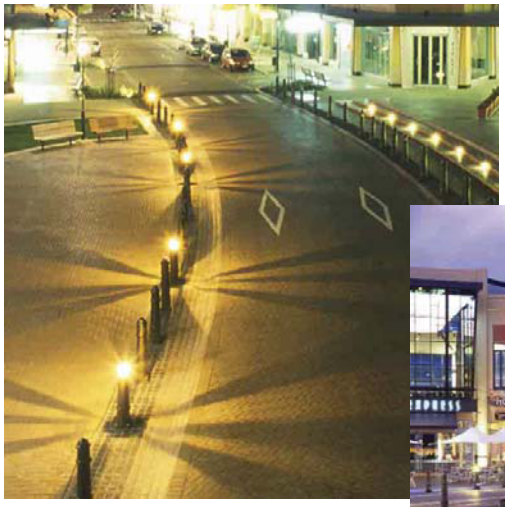


Bicycle Rack

At Grade Planter Flush with Paving

Pedestrian Amentites Examples
Exhibit 4-6

[This page intentionally left blank]



Bollards

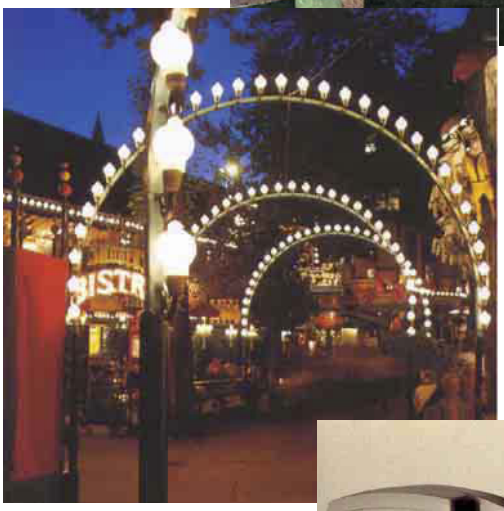
Up Lighting





Variety in Lighting





String Lighting

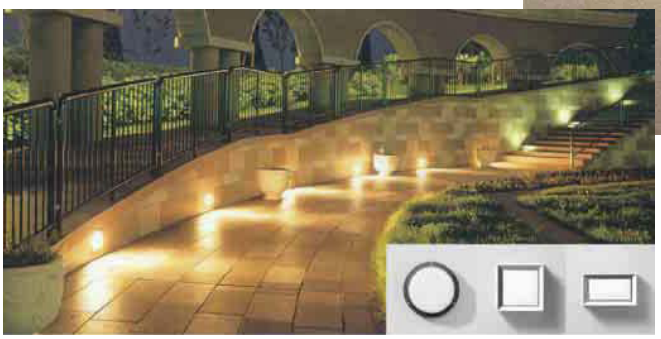
Street Pole



Parking Lot Lighting

Entry Lighting





Step Lighting

Lighting Examples
Exhibit 4-7

[This page intentionally left blank]

4.11 LANDSCAPING / HARDSCAPING

A Landscape Master Plan provides planting materials and locations to complement the building architecture, enhance the parking lot areas, and soften the effect of hardscapes and hard surfaces. Exhibit 4-8 provides the conceptual landscape plan for the Shoppes Retail. Although, the Landscape Plan is conceptual and displays only the retail component, similar design, palette and sizing of landscaping will provided in the other components of the Specific Plan including The Shoppes Mixed Use. The plant palette includes a variety of plant materials such as:

- Parking Lot Trees
  Cinnamomum Camphora
  Tristania Conferta
  Magnolia Grandiflora
  Lagerstoemia Indica
  Ulmus Parvifolia

- Entry/Accent Trees
  Phoenix Dactylifera
  Washington Filfera
  Washington Robusta

- Screen Trees
  Brachychiton Populneus
  Cupressus Sempervirens "Glauca"
  Cupressus Arizonica

- Small Accent Trees
  Bauhinia Variegata
  Lagerstroemia Sp.
  Geijera Parviflora

Substitution of the aforementioned list may be approved by the City Manager or designee.

Enhanced paving will generally be located along the storefront walkways of Main Street and City Center Drive, primary pedestrian crosswalks and at the Main Street and City Center Drive intersection. Enhanced paving shall be defined by the following materials, as approved by the City Manager or designee:

- Integral colored concrete with saw cut pattern including a sandblast or acid wash finish;

- Concrete interlocking paving units with accent bands;

- Natural grey concrete with saw cut pattern including including a sandblast or acid wash finish with paver accents or borders;
- Any combination of the above materials, pattern and finishes;
- Standard pedestrian paving will be permitted located along the rear of the retail buildings where tenant service doors and loading activities are to take place or at other areas of secondary pedestrian access not affiliated with the retail storefronts. Standard pedestrian paving shall be defined by natural grey concrete with saw cut pattern including a sandblast or acid wash finish with paver accents or borders.

4.12 STREET TREES

Trees in the public rights-of-way complement the unique character of each street. Street trees include:

- City Center Drive and Main Street
  Pyrus Calleryana Bradford
  Koelreuteria Paniculata
  Platanus Acerifolia
- Grand Avenue and Peyton Drive
  Brachychiton Populneus
- Remaining Project Perimeter
  Tipuana Tipu
  Lirodendron Tulipifera
  Brachychiton Populneus

Substitution of the aforementioned list may be approved by the City Manager or designee.



PROPOSED TREE LEGEND

STREET TREES
(MAIN STREET AND CENTER DRIVE)
KOELREUTERIA PANICULATA
PYRUS CALLERYANA "CAPITAL"

STREET TREES
(PROJECT PERIMETER)
BRACHYCHITON POPULNEUS

PARKING LOT TREES

LAGERSTROEMIA INDICA SP.
ULMUS PARVIFOLIA
PLATANUS MEXICANA

ENTRY / ACCENT TREES

PHOENIX DACTYLIFERA

The Shoppes Retail
Conceptual Landscape Plan
Exhibit 4-8

[This page intentionally left blank]

4.13 SIGNS

Signs within the Shoppes Retail and Shoppes Mixed Use provide for tenant identification signs and directional signs utilizing colors, materials, finishes, and illumination so as to complement one another and be consistent with the upscale character of the Specific Plan area. The overall character of the signage and graphics for the Shoppes Retail and Shoppes Mixed-Use is one of a traditional American Main Street that reflects the variety and uniqueness of the architecture. Signs are compatible with the pedestrian scale of the environment rather than that of a larger vehicular-scaled venue. In recognition of these distinct characteristics, the requirements of Development Code Chapter 16.38, "Signs," are waived subject to City Manager or designee review and approval of a sign program. The general location of the major signs for the Shoppes Retail may be as generally shown on Exhibit 4-9, *Shoppes Retail Conceptual Sign Locations*, and described in the following sections.

4.13.1 Wayfinding Signs

The wayfinding signs help the visitor navigate through an urban environment. The graphics, like in many similar urban environments, help to create a sense of orientation for the first time visitor, and a sense of comfort for those that return often.

4.13.2 Pylon / Reader Board

The Pylon/Reader Board sign will be located near the intersection of Grand Avenue and the Chino Valley Freeway (SR-71) either south of Grand Avenue on private property or within the Grand Avenue right-of-way, as depicted in Exhibit 4-12. The Pylon/Reader Board sign may be up to 100 feet tall and may only include the project name (i.e. 'The Shoppes at Chino Hills'), a project logo or icon, the name 'City of Chino Hills', and the names of the tenants operating on the project site.[§§] With approval from the Shoppes Retail owner and management, tenants located in the Shoppes Mixed-Use district may advertise on the Pylon/Reader Board sign.

4.13.3 Major Site Identity Monuments

Located at major corners to the project, the major site identity monuments are of sizes appropriate to be readable from vehicles traveling at speeds of up to 50 miles per hour. Individual dimensional letters and logo will identify the project. The letters and logo may be internally illuminated. Exhibit 4-13 illustrates examples of Major Site Identity Monuments.

4.13.4 Project Gateways and Identity

The vehicular entrance gateways and identities will be located on either side of the major roadway entrances on masonry pylons or "neighborhood" markers

[§§] Text as amended May 18, 2006.

and will be at a scale appropriate to be read from within a vehicle. Illumination of the identity plaques will be from the ground or a wall mounted external source, not internally illuminated. Exhibit 4-13 illustrates examples of Project Gateways and Identity signage.

4.13.5 Vehicular Scaled Directional Signs

Located at vehicular intersections on-site, these signs guide the visitor to different uses on the site such as to offices, major anchors, and municipal buildings. The project name is located on the sign in a smaller, more understated way so as not to detract from the listings. This type of signage may also provide direction to the sales/leasing office for residential uses within The Shoppes Mixed Use. Exhibit 4-14 illustrates examples of Vehicle Scaled Directional Signs.

4.13.6 Pedestrian Scaled Directional Signs

This sign type is used to direct the pedestrian to various on-site uses and is located along major paths of travel on sidewalks and in gathering areas. Pedestrian-scaled signs also point the way to amenities such as public restrooms, security, information booths, and elevators. The signs are pole or ground-mounted and include appropriate text and arrows. Exhibit 4-14 illustrates examples of Pedestrian Scaled Directional Signs.

4.13.7 Project Directory Signs and Community Board

Project directory signs are located in at least two prominent positions on the Retail Shoppes Site. The signs include a map of the Shoppes Retail and indicate all uses/tenants so as to allow visitors to orient themselves and proceed to any destination shown. Exhibit 4-15 illustrates examples of Project Directory Signs and Community Board.

4.13.8 Site Pageantry

Site pageantry consists of fabric or metal banners that are attached to light poles or building facades throughout the project. They are a part of themed graphics of the project and may include the project's name and/or logo, holiday or special event greetings and are not intended for display of tenant graphics. Site Pageantry will be concentrated along the main retail streets of the project and at major entrances to the site. Exhibit 4-16 illustrates examples of Site Pageantry.

Note: Signage at the southeast corner of Grand and Peyton shall provide for an easement to accommodate the Citywide Identity Enhancement Program as specified by the City Manager or designee.



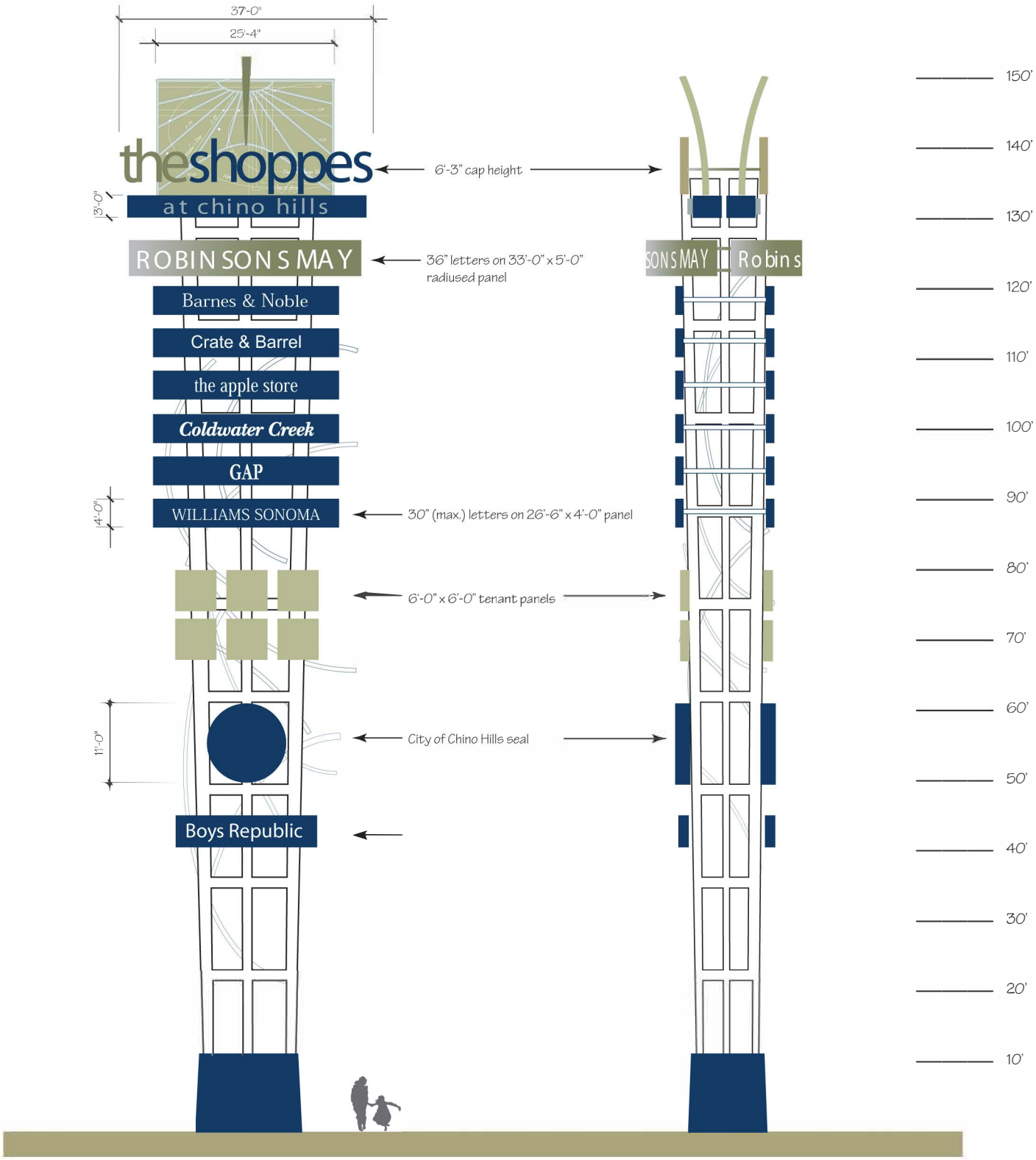
The Shoppes Retail
Conceptual Sign Locations
Exhibit 4-9

[This page intentionally left blank]



Pylon / Reader Board Examples
Exhibit 4-10

[This page intentionally left blank]



Pylon / Reader Board Example
Exhibit 4-11

[This page intentionally left blank]



Pylon / Reader Board
Conceptual Location
Exhibit 4-12

[This page intentionally left blank]

Project Gateway Signs







Major Site
Identity Signs





Major Site Identity Signs &
Project Gateways
Exhibit 4-13

[This page intentionally left blank]

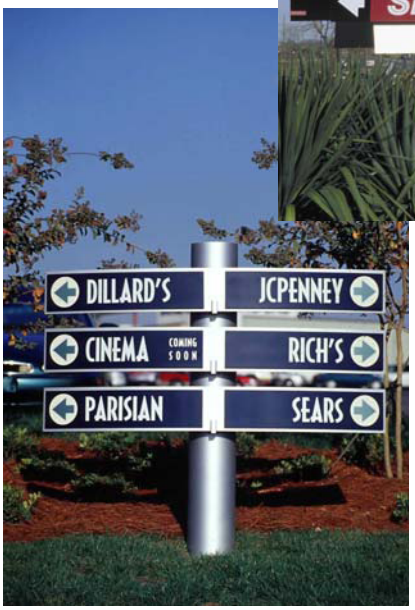


Pedestrian Directional Signs











Vehicular Directional Signs

Directional Signs
Exhibit 4-14

[This page intentionally left blank]







Project Directory Signs &
Community Board
Exhibit 4-15

[This page intentionally left blank]









Site Pageantry
Exhibit 4-16

[This page intentionally left blank]

4.13.9 Regulatory Signage

The street and passage name identities will be in the form of traditional street signs that will be freestanding or mounted to a pole light, or mounted on building walls adjacent to street or sidewalks. The design of the signs will be reflective of the theme of the overall project. Other site regulatory signs such as stop signs, parking signs, handicap parking signs, service areas, etc. will incorporate elements of similar to the street identity signs. Exhibit 4-17 illustrates examples of Regulatory Signage.

4.13.10 Tenant Identity Signage

Tenant identity signage mounted to building facades is located throughout the Shoppes Retail and Shoppes Mixed-Use designation. Signage is an integral design feature of each tenant's storefront design. Each tenant storefront is designed to complement the design of the overall facade and building design. Individual tenants are encouraged to use a mixture of urban signage techniques to give variety and the appearance of having evolved in a high-end urban setting. An eclectic mix of dimensional signage will be encouraged to create a sense of uniqueness and variety along the streetscape.

Sign formats for tenant signs may be applied in the following fashion depending on location and storefront design:

- Fascia signs;
- Blade signs;
- Lettering and graphics on valances or awnings;
- Signage applied to the glass show windows, storefronts and entrances;
- Inlaid floor graphics;
- Wall mounted plaques and
- Signage applied to canopies.

Acceptable sign types include:

- Dimensional metal, glass or other material with a permanent appearance indirectly lit;
- Reverse channel letters with halo illumination, with opaque face and sides and non-reflective background;
- Embedded, flush, recessed box signs of an opaque material with push through, translucent copy;

- Incised letters cut into or cast out of an opaque material and indirectly lit;
- Sculptured, iconographic elements contextual to the storefront design;
- Internally illuminated channel letters or logo.

In general, all tenant signage must be proportionate to the storefront and building design as well as the urban nature of the street. Each tenant is allowed primary building fascia signage for each elevation facing the common area, with additional blade, show window, wall plaques, floor, awning, and canopy signs in accordance with the City approved sign program for the project. No sign will exceed sixty-six percent (66%) of storefront width. Blade signs will be mounted to allow an eight foot (8') minimum clearance above the walkway. Exhibits 4-18 and 4-19 illustrate examples of Tenant Signage. The dashed line on Exhibit 4-9, *Shoppes Retail Conceptual Sign Locations,* is to indicate possible sign locations only. Final location will be determined as each space is tailored to each individual tenant.

4.13.11 Prohibited Signage

- Animated components, flashing lights, rotating or flashing signs (except for the reader board/pylon sign);
- Illuminated sign boxes;
- Portable signs**;
- Balloon or inflatable signs**;
- Signs which emit sound or odor;
- Signs with exposed raceways, conduit, junction boxes, or transformers;
- Paper, cardboard, or Styrofoam and signs made of simulated materials e.g. wood-grained plastic**;
- Wood signs.

** Such signage may be allowed to be used at The Shoppes Mixed-Use on a temporary basis. Such signage shall be approved by the Community Development Director or designee.



Regulatory Signs
Exhibit 4-17

[This page intentionally left blank]

Window Signs







Blade Signs





Awing Signs





Tenant Signs
Exhibit 4-18

[This page intentionally left blank]



Floor Graphics







Fascia Signs





Wall
Plaques



Tenant Signs
Exhibit 4-19

[This page intentionally left blank]

5 IMPLEMENTATION PLAN

The purpose of this section is to define the implementation measures necessary to carry out The Shoppes at Chino Hills Retail/Civic Center/Residential/Community Park Specific Plan.

5.1 PHASING

Phasing of the Specific Plan meets the following objectives:

- The orderly build-out of the mixed-use project based upon market and economic conditions.
- The provision of adequate infrastructure and public facilities concurrent with development of each phase.
- The protection of public health, safety and welfare.

The timing of implementation of the five project components is dependent upon the completion of a new Community Park. The City requires that the public continuously have reasonably adequate access to park facilities. No demolition or construction activity on the current Chino Hills Community Park is expected to occur until construction of the Community Park is substantially completed. Construction of the Community Park was completed by the City in February 2007.

It is envisioned that the Shoppes Retail will be built in one phase, with the timing of completion of perimeter restaurant pads dependent upon market activity.

5.2 FINANCING AND FEES

California Government Code Section 65451 sets forth the basic content of specific plans and one of the requirements is to include information relating to project financing and fees.

Various techniques are available for financing the required infrastructure and project components. Since certain elements of the infrastructure and project will be for use of the general public, public financing may be appropriate for these elements. Possible public financing sources include: Community Facility District funds, Development Impact Fees, Grants, Landscape and Lighting District Funds and the General Fund. All applicable development impact fees and all other related administration fees are collected at the time of issuance of building permits, unless otherwise determined by the City.

5.3 GENERAL PROVISIONS

5.3.1 Applicability

The development standards contained herein provide specific standards for land use development within the Specific Plan area. The Specific Plan supersedes the otherwise applicable City of Chino Hills development standards/regulations unless stated herein to the contrary. Whenever the provisions and development standards contained herein conflict with those contained in the City of Chino Hills Development Code, the provisions of the Specific Plan shall take precedence. Where the Specific Plan is silent, the City of Chino Hills Development Code shall apply.

5.3.2 Administration

The Shoppes at Chino Hills Retail/Civic Center/Residential/Community Park Specific Plan serves as the implementation tool for the General Plan as well as the zoning for the project site. The Specific Plan addresses general provisions, permitted uses, development standards and design guidelines.

5.3.3 Interpretation

Development within the Specific Plan area is implemented through the approval of parcel and tentative and/or tract maps. The administrative process described below provides mechanisms for review and approval of development projects within the Specific Plan consistent with the Specific Plan objectives.

Unless otherwise provided, any ambiguity concerning the content or application of the Specific Plan is resolved by the City Manager or designee in a manner consistent with the goals, policies, purposes and intent established in this Specific Plan.

5.3.4 Implementation

All development proposals within the Specific Plan are subject to the implementation procedures established herein. See Exhibit 5-1, for the Project Review and Approval Process Chart.

5.3.5 Specific Plan Revisions

Revisions to the Specific Plan may be requested by the applicant or by the City at any time pursuant to Section 65453(a) of the Government Code. Revisions are processed pursuant to the provisions of the Government Code for Specific Plan and the City of Chino Hills Development Code. In the event the proposed revisions require supplemental environmental analysis, pursuant to the California Environmental Quality Act (CEQA), the applicant is responsible for preparing the necessary CEQA documentation.

5.3.6 Minor Modifications

The following constitute Minor Modifications to the Specific Plan. They are subject to review and approval by the City Manger or designee. They do not require amendment to the Specific Plan In no case, shall minor modifications result in an increase in density, increase in height, reduction in setback, decrease in parking ratios, or change of use in a manner that would be inconsistent with the requirement of the Specific Plan:

- Change in utility and/ public service provider;
- Minor changes to text and maps intended to clarify Specific Plan information, provided such changes do not add density or modify the development policies or standards of the Specific Plan;
- Minor changes to landscape materials, wall materials, entry design, streetscape design and signage which are consistent with the conceptual design set forth in the design guidelines contained with the Specific Plan provided that the substitute materials and designs approved are of the same of better quality;
- Minor changes to the design guidelines including architecture, design, and color palette, provided that the design is of the same or better quality;
- Minor changes to the Shoppes Retail and Shoppes Mixed-Use conceptual site plans, building dimensions, or architectural elevations as depicted in the Specific Plan necessary to accommodate proposed improvements and determined residential product provided that such do not alter the general layout and location on the conceptual site plans and are in compliance with all of the restrictions set forth in Table 2-1, "Shoppes Retail Uses" and Table 2-3, "Shoppes Mixed-Use," respectively;
- Changes to the Civic Center conceptual site plan, building dimensions, or architectural elevations as depicted in the Specific Plan to accommodate City requirements;
- Other modifications of a similar nature to those listed above as determined by the City Manager or designee.

5.3.7 Appeals

All appeals pertaining to this Specific Plan shall be made to the Planning Commission. The applicant or any other entity shall have the right to appeal the decision of the Planning Commission on any determination by filing an application on forms provided by the City of Chino Hills within ten (10) business days following the final date of action for which an appeal is made.

Appeals shall be processed consistent with the provisions of the City of Chino Hills Development Code.

5.3.8 Site Development Permits

A Site Development Permit (SDP, Staff Approval) is required for the hotel and retail components of the Shoppes Mixed-Use prior to submittal of construction plans. Adoption of the Specific Plan includes adoption of the design guidelines contained herein which provide direction for the design of the development projects within the project site.

5.3.9 Maps

Approval of maps may occur with or subsequent to the adoption of the Specific Plan creating parcels for development. The project may include parcel map(s), lot line adjustments and/or other minor subdivision actions.

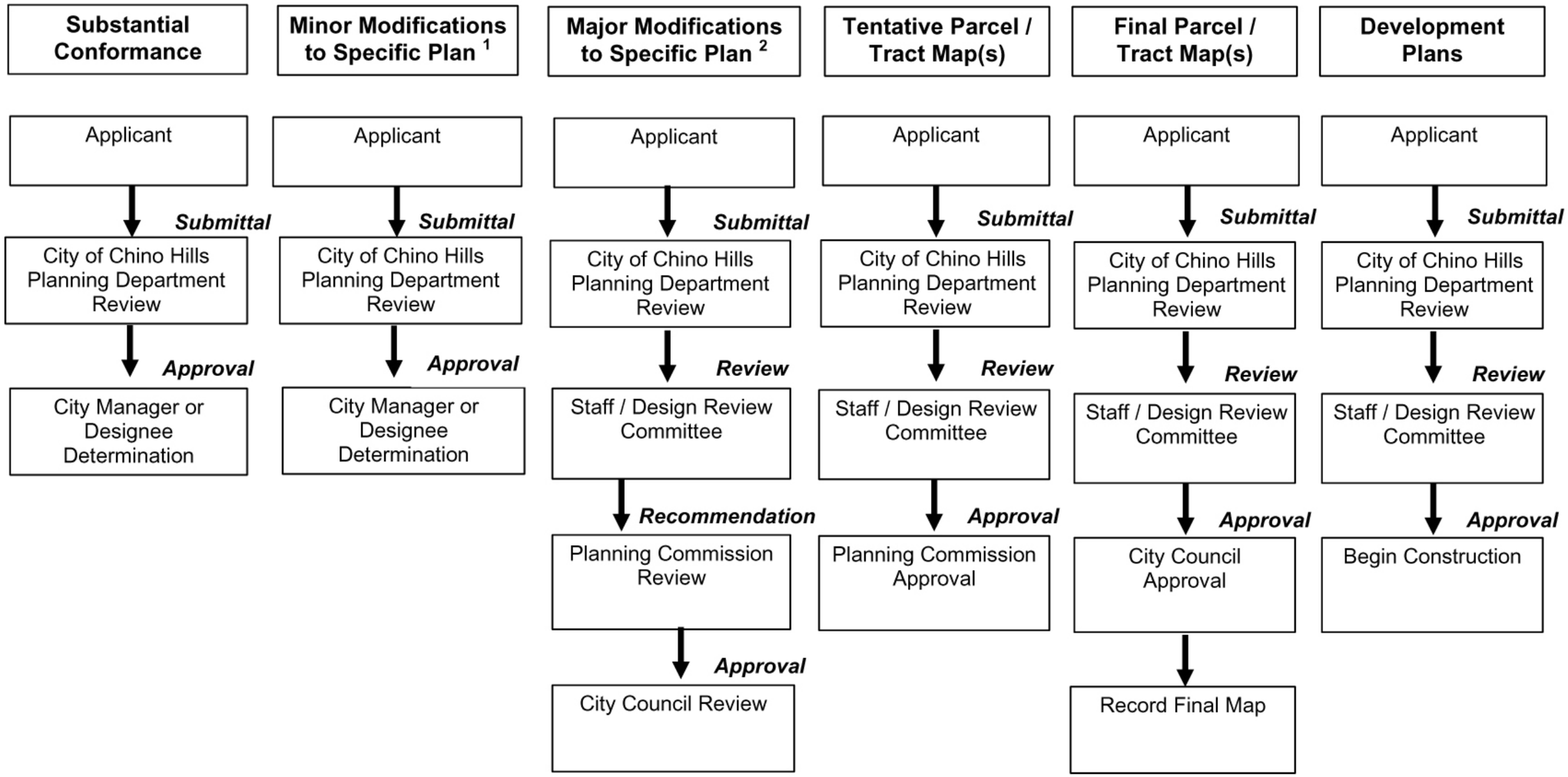
5.3.10 Development Agreement

No provisions within this Specific Plan shall alter or supersede Development Agreement provisions concerning the Shoppes Retail project as approved by the City of Chino Hills City Council.

5.4 GENERAL PLAN CONSISTENCY

California Government Code (Title 7, Division 1, Chapter 3, Article 8, Section 65450-65457) permits adoption and administration of specific plans as an implementation tool for elements contained in the local general plan. Specific plans must demonstrate consistency in regulations, guidelines and programs with the goals and policies set forth in the general plan.

The Shoppes at Chino Hills Retail/Civic Center/Mixed-Use/Residential/Community Park Specific Plan has been prepared in conformance with the goals and policies of the City of Chino Hills General Plan.



[1] Minor Modifications are defined in Section 5.3.6, *Minor Modifications*, in this Specific Plan
[2] Major Modifications constitute those changes and revisions not referenced in Section 5.3.6, *Minor Modifications*, of the Specific Plan

Project Review & Approval Process Chart
Exhibit 5-1

[This page intentionally left blank]

[This page intentionally left blank]