American University of Health Sciences (AUHS)
Comprehensive Master Plan Update
Initial Study and Negative Declaration

Lead Agency:

City of Signal Hill
Community Development Department
2175 Cherry Avenue
Signal Hill, California 90755

Prepared by:

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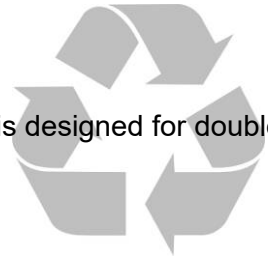
Public Review Draft
July 26, 2022



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Appendix A Comprehensive Master Plan Update
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1 Introduction

The City of Signal Hill (Lead Agency) received an application from American University of Health Sciences ("AUHS" or "applicant") for a Comprehensive Master Plan Update proposing new programs of study ("Project" or "Master Plan Update") at the applicant's existing AUHS campus at 1600 East Hill Street ("Project Site") in the City of Signal Hill, California. The application includes an update to the existing Master Plan for the campus. The approval of the application constitutes a *project* that is subject to review under the California Environmental Quality Act (CEQA) 1970 (Public Resources Code §§ 21000, *et seq.*), and the CEQA Guidelines (14 California Code of Regulations §§ 15000, *et. seq*.). This Initial Study was prepared to assess the short-term, long-term, and cumulative environmental impacts resulting from the proposed project. This report was prepared to comply with CEQA Guidelines § 15063, which sets forth the required contents of an Initial Study. These include:

- A description of the project, including the location of the project (See Section 2);
- Identification of the environmental setting (See Section 2.10);
- Identification of potentially significant impacts and a determination of effects (See Section 3);
- Identification of environmental effects by the use of a checklist, matrix, or other methods, provided that entries on the checklist or other form are briefly explained to indicate that there is some evidence to support the entries (See Section 4);
- Discussion of ways to mitigate significant effects identified, if any (See Section 4);
- Examination of whether the project is compatible with existing zoning, plans, and other applicable land use controls (See Section 4.11); and
- The name(s) of the person(s) who prepared or participated in the preparation of the Initial Study (See Section 5).

1.1 – Purpose of CEQA

The legislative intent of the State law known as CEQA is established in Section 21000 of the California Public Resources Code, as follows:

a) The maintenance of a quality environment for the people of this state now and in the future, is a matter of statewide concern.
b) It is necessary to provide a high-quality environment that at all times is healthful and pleasing to the senses and intellect of man.
c) There is a need to understand the relationship between the maintenance of high-quality ecological systems and the general welfare of the people of the state, including their enjoyment of the natural resources of the state.
d) The capacity of the environment is limited, and it is the intent of the Legislature that the government of the state take immediate steps to identify any critical thresholds for the health and safety of the people of the state and take all coordinated actions necessary to prevent such thresholds being reached.
e) Every citizen has a responsibility to contribute to the preservation and enhancement of the environment.
f) The interrelationship of policies and practices in the management of natural resources and waste disposal requires systematic and concerted efforts by public and private interests to enhance environmental quality and to control environmental pollution.
g) It is the intent of the Legislature that all agencies of the state government which regulate activities of private individuals, corporations, and public agencies which are found to affect the quality of the environment, shall regulate such activities so that major consideration is given to preventing environmental damage while providing a decent home and satisfying living environment for every Californian.

The Legislature further finds and declares that it is the policy of the state to:

h) Develop and maintain a high-quality environment now and in the future, and take all action necessary to protect, rehabilitate, and enhance the environmental quality of the state.
i) Take all action necessary to provide the people of this state with clean air and water, enjoyment of aesthetic, natural, scenic, and historic environmental qualities, and freedom from excessive noise.
j) Prevent the elimination of fish or wildlife species due to man's activities, ensure that fish and wildlife populations do not drop below self-perpetuating levels, and preserve for future generations representations of all plant and animal communities and examples of the major periods of California history.
k) Ensure that the long-term protection of the environment, consistent with the provision of a decent home and suitable living environment for every Californian, shall be the guiding criterion in public decisions.
l) Create and maintain conditions under which man and nature can exist in productive harmony to fulfill the social and economic requirements of present and future generations.
m) Require governmental agencies at all levels to develop standards and procedures necessary to protect environmental quality.
n) Require governmental agencies at all levels to consider qualitative factors as well as economic and technical factors and long-term benefits and costs, in addition to short-term benefits and costs, and to consider alternatives to proposed actions affecting the environment.

A concise statement of legislative policy, with respect to public agency consideration of projects for some form of approval, is found in CEQA § 21002, quoted below:

> The Legislature finds and declares that it is the policy of the state that public agencies should not approve projects as proposed if there are feasible alternatives or feasible mitigation measures available which would substantially lessen the significant environmental effects of such projects, and that the procedures required by this division are intended to assist public agencies in systematically identifying both the significant effects of proposed projects and the feasible alternatives or feasible mitigation measures which will avoid or substantially lessen such significant effects. The Legislature further finds and declares that in the event that specific economic, social, or other conditions make infeasible such project alternatives or such mitigation measures, individual projects may be approved in spite of one or more significant effects thereof.

1.2 – Public Comments

Comments from all agencies and individuals are invited regarding the information contained in this Initial Study. Such comments should explain any perceived deficiencies in the assessment of impacts in the Initial Study. Materials related to the preparation of this Initial Study are available for public review in person or on the City's website at: https://www.cityofsignalhill.org/612/Current-Projects. To request an appointment to review these materials, please contact:

Ryan Agbayani, Associate Planner
Community Development Department
2175 Cherry Avenue
Signal Hill, California 90755
(562) 989-7341

All written comments received during the 30-day public review period for the Initial Study/Negative Declaration will be considered by the City of Signal Hill prior to adoption.

2 Project Description

2.1 – Project Title

American University of Health Sciences (AUHS) Master Plan Update

2.2 – Lead Agency Name and Address

City of Signal Hill
Community Development Department
2175 Cherry Avenue
Signal Hill, California 90755

2.3 – Contact Person and Phone Number

Ryan Agbayani, Associate Planner
(562) 989-7341

2.4 – Project Location

The Project site is located at 1600 East Hill Street in the City of Signal Hill, California (See Exhibit 1, Regional Context Map and Exhibit 2, Project Vicinity Map).

- Latitude 33° 47’ 46.56” North, Longitude 118° 10’ 17.15” West
- APN: 7215-009-005

2.5 – Project Sponsor’s Name and Address

Dr. Marilyn Uvero, COO/VP of Operations and Development
American University of Health Sciences (AUHS)
1600 East Hill Street
Signal Hill, California 90755

2.6 – General Plan Land Use Designation

3.3 – Commercial Office

2.7 – Zoning District

CO – Commercial Office

2.8 – Surrounding Land Uses

The approximately 3.75-acre Project site is bound by East Hill Street on the north, Walnut Avenue on the West, and Gaviota Avenue on the east. The site is surrounded by residential uses to the west, north and east. There is also vacant land to the west and south of the site. Surrounding uses are summarized in Table 1 below.

Table 1
Surrounding Land Uses

Direction	General Plan Designation	Zoning District	Existing Land Use
Project Site	3.3 – Commercial Office	CO – Commercial Office	AUHS Campus
North	1.1 – Low Density Residential	RLM-2 – Residential Low/Medium-2	Single Family Homes
South	4.1 – Light Industrial	LI – Light Industrial	Vacant Land
East	1.3 – High Density Residential	RH – Residential High Density	Multi-Family Housing
West	1.4 – Very High Density Residential/ 4.1 – Light Industrial	SP-7 – Special Purpose Housing/ LI – Light Industrial	Multi-Family Housing/ Vacant Land

2.9 – Environmental Setting

The Project is located on a developed site in a mostly developed area of the City of Signal Hill, California. The Project site is developed with the American University of Health Sciences (AUHS), and includes three separate buildings totaling 72,000 square feet (SF) and associated parking and landscaping (See Exhibit 3, Existing Site Conditions). The campus currently includes 237 parking spaces for students, faculty, and staff. The Project site is surrounded by residential uses on two sides, vacant land on one side, and a combination of vacant land and multifamily housing on the west side. The vacant land to the south and west of the site is anticipated to be developed with the Signal Hill Business Park, which is currently in the entitlement process. There are active and abandoned oil wells approximately 0.3 miles to the north of the site. Interstate 405 (I-405) is located approximately 1.2 miles north of the site, Interstate 710 (I-710) is located approximately 2 miles west of the site, and State Route 1/ Pacific Coast Highway (SR-1) is located approximately 0.4 miles south of the site. There are several public schools in close proximity to the Project site, including: Signal Hill Elementary School, Alvarado Elementary School, Butler Middle School, and Jessie Elwin Nelson Middle School. The Project site slopes gently from north to south, with an elevation ranging between approximately 39 feet above mean sea level (AMSL) in the southern portion of the site up to 72 feet AMSL in the northern portion of the site.

2.10 – Project Description

AUHS has prepared an educational Master Plan to reflect its proposal to offer new programs of study to supplement the existing programs that are currently offered at its campus at 1600 E. Hill St. (See Appendix A). The programs of study that are currently offered include the Bachelor of Science in Nursing (SON-BSN) and the Doctorate of Science in Pharmaceutical Sciences (SOP). The new programs of study included in the Master Plan Update are Master of Science in Nursing and Doctor of Nursing Practice within the School of Nursing (SON-MSN), Doctorate Degree within the AUHS School of Medicine (SOM), the American University Research Academy (AURA) Private High School, and the Outpatient Pediatrics Clinic and Pharmacy.

The AUHS School of Medicine will offer a Doctorate degree in education to students of diverse backgrounds. AURA will be an institution of learning where students of diverse backgrounds will be taught by a diverse faculty equipped with mastery in delivering quality instruction based on required curriculum. AUHS proposes to establish the AURA American Research Academy private high school

to open in the Fall of 2022, the Outpatient Pediatrics Clinic and Outpatient Clinic Pharmacy in the Summer of 2023, and the AUHS Medical School in Fall 2024.

The Outpatient Pediatrics Clinic and Pharmacy will provide an interdisciplinary delivery of pediatric patient care, and support the School of Nursing and School of Pharmacy students in their pediatric clinical rotation at a university-based services. An AUHS Care Model will be launched to provide care to the under-served pediatric patient population from the communities that it serves. The Pharmacy will provide services that utilize the knowledge and skills of pharmaceuticals, and drugs systems (within accepted professional standards and ethics) in support the School of Pharmacy students and as a service to the City of Signal Hill.

AUHS currently has an enrollment of 180 total students, of which 70 students are on campus. Under the proposed Master Plan Update, AUHS anticipates that enrollment will increase to 470 total students, of which 231 would be on campus and 239 would be off-campus. These changes would correspond with a net increase of 290 total students, and an increase of 161 students on campus. In addition, the number of on-campus faculty and staff would increase from 27 to 63, a net increase of 36 faculty and staff on the site. All the additional programs of study would occur within the existing buildings on the site. No exterior physical alterations or expansions to the existing buildings, site, or surrounding area are proposed. No demolition, ground-disturbing, or construction activities are proposed and no additional building square footage or parking is proposed as part of the Master Plan Update. Vehicular access to the site will continue to be provided by the four (4) existing driveways on Walnut Avenue. So as not to add to the morning traffic congestion, AURA's starting and ending bells will not coincide with the Signal Hill Elementary School, also located near the intersection of East Hill Street and Walnut Avenue. In addition, students who attend the High School will only be allowed a total of 20 parking permits and will be prohibited from parking on adjacent streets. The remaining high school students will be expected to be dropped off, or use other means of transportation. High school parking permit preference will go first to seniors and then by birth date if additional spots are available.

Ongoing tenant improvements to building three at the AUHS campus are being performed according to the California Building Code (CBC) and the California Green Building Standards Code (CGBSC) and the City of Signal Hill Municipal Code (SHMC).

2.11 – Required Approvals

The City of Signal Hill is the only land use authority for this project, and requires the following approvals:

- Adoption of a Zoning Ordinance Amendment (ZOA 22-05) for the AUHS/AURA Specific Plan (SP-25).

2.12 – Other Public Agencies Whose Approval is Required

- None.

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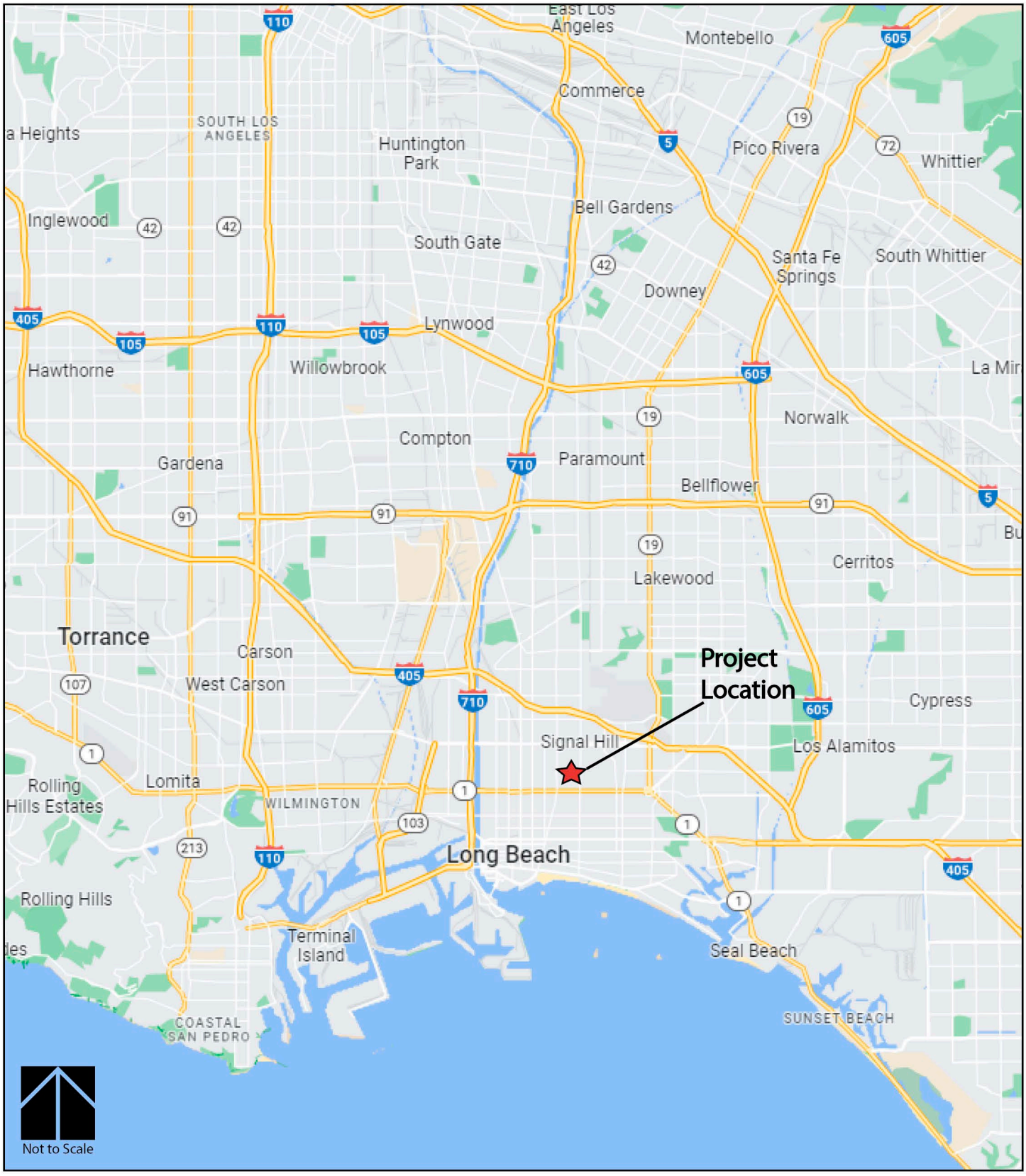

Source: Google Maps

Exhibit 1 Regional Context Map

American University of Health Sciences Master Plan Update
Signal Hill, California

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Source: Google Earth

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Exhibit 2 Project Vicinity Map

American University of Health Sciences Master Plan Update
Signal Hill, California

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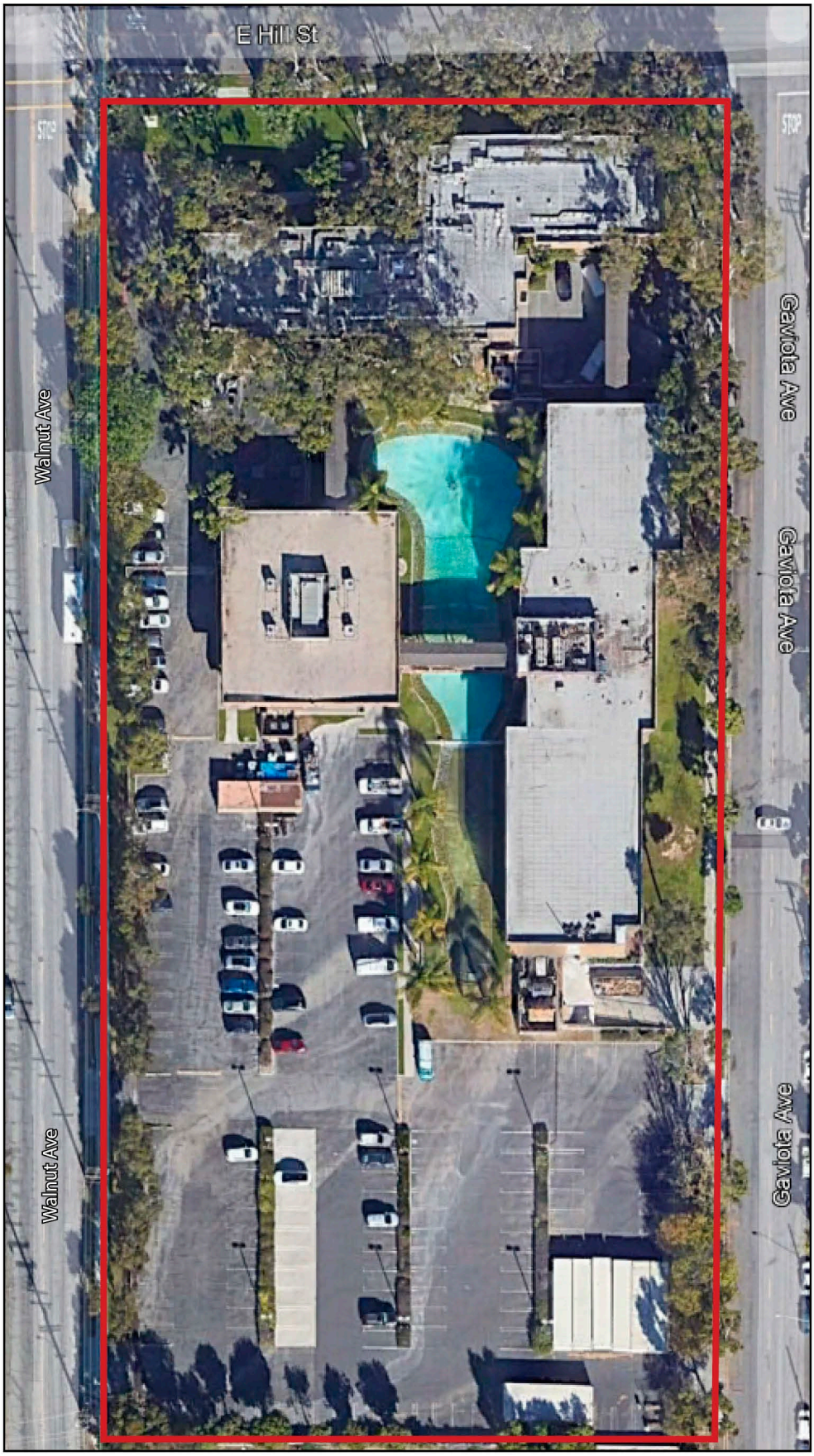

Source: Google Earth

Exhibit 3 Existing Site Conditions

American Universrity of Health Sciences Master Plan Update
Signal Hill, California

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3 Determination

3.1 – Environmental Factors Potentially Affected

The environmental factors checked below would be potentially affected by this project, involving at least one impact that is a 'Potentially Significant Impact' as indicated by the checklist on the following pages.

☐	Aesthetics	☐	Agriculture Resources	☐	Air Quality
☐	Biological Resources	☐	Cultural Resources	☐	Energy
☐	Geology /Soils	☐	Greenhouse Gas Emissions	☐	Hazards & Hazardous Materials
☐	Hydrology / Water Quality	☐	Land Use / Planning	☐	Mineral Resources
☐	Noise	☐	Population / Housing	☐	Public Services
☐	Recreation	☐	Transportation/Traffic	☐	Tribal Cultural Resources
☐	Utilities / Service Systems	☐	Wildfire	☐	Mandatory Findings of Significance

3.2 – Determination

☑	I find that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.
☐	I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.
☐	I find that the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.
☐	I find that the proposed project MAY have a 'potentially significant impact' or 'potentially significant unless mitigated' impact on the environment, but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.
☐	I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.

Name: Ryan Agbayani, Associate Planner Date

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4.1 – Aesthetics

Except as provided in Public Resources Code Section 21099, would the project:

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
a) Have a substantial adverse effect on a scenic vista?	☐	☐	☐	☑
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within view from a state scenic highway?	☐	☐	☐	☑
c) In non-urbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surroundings? (Public views are those that are experienced from publicly accessible vantage point.) If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality?	☐	☐	☐	☑
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	☐	☐	☐	☑

a) **No Impact.** Scenic vistas can be impacted by development in two ways. First, a structure may be constructed that blocks the view of a vista. Second, the vista itself may be altered (i.e., development on a scenic hillside). The proposed Master Plan Update does not include any physical alterations to the existing site condition. Therefore, the proposed Project would not obstruct any scenic vistas and no impact would occur.

b) **No Impact.** The Project is not located adjacent to a designated state scenic highway or eligible state scenic highway, as identified on the California Scenic Highway Mapping System.[1] The proposed Project is located in a fully developed, urbanized area that contains no scenic resources. Therefore, no impact to scenic resources visible from a state scenic highway would occur as a result of the proposed Master Plan Update.

c) **No Impact.** Degradation of visual character or quality is defined by substantial changes to the existing site appearance through construction of structures such that they are poorly designed or conflict with the site's existing surroundings. The site is currently occupied by the American University of Health Sciences (AUHS) and is located in a fully developed, urbanized area. The proposed Master Plan Update does not include any physical alterations to the existing site condition. Continued operation of AUHS under the proposed Master Plan Update would not substantially alter the existing visual character of the site or area. All existing building features on the site would be retained with adoption of the update. Additionally, as discussed above, the update would not conflict with any protected views and is consistent with surrounding uses. No impact would occur.

d) **No Impact.** Excessive or inappropriately directed lighting can adversely impact night-time views by reducing the ability to see the night sky and stars. Glare can be caused from unshielded or misdirected lighting sources. Reflective surfaces (i.e., polished metal) can also cause glare. Impacts associated with glare range from simple nuisance to potentially dangerous situations (i.e., if glare is directed into the eyes of motorists). Because no physical alterations are proposed as part of the Master Plan Update no new sources of lighting or glare will be introduced in the Project area. Therefore, the update will not create a new source of substantial light or glare which would adversely affect day or nighttime views in the area. No impact will occur.

4.2 – Agriculture and Forest Resources

In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Department of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment project, and forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board.

Would the project:

	Potentially Significant Impact	**Less Than Significant with Mitigation Incorporation**	**Less Than Significant Impact**	**No Impact**
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	☐	☐	☐	☑
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?	☐	☐	☐	☑
c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code Section 12220(g)), timberland (as defined by Public Resources Code Section 4526), or timberland zoned Timberland Production (as defined by Government Code Section 51104 (g))?	☐	☐	☐	☑
d) Result in loss of forest land or conversion of forest land to non-forest use?	☐	☐	☐	☑
e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland to non-agricultural use or conversion of forest land to non-forest use?	☐	☐	☐	☑

a) **No Impact.** Due to its urban setting, the Project site and its surroundings are not included in the Farmland Mapping and Monitoring Program of the California Department of Conservation and the Project site is not zoned for agricultural use and is not under a Williamson Act Contract.[2, 3] In addition, there are no areas of forestland as defined in Public Resources Code Section 12220(g) or timberland as defined in Public Resources Code Section 4526 within the City of Signal Hill. The proposed Project is located in a developed, urbanized area, and surrounded primarily by residential, commercial, and industrial uses. The proposed Master Plan Update does not include any physical alterations to the existing site condition. The proposed Project would not change the existing environment in a manner that would result in the conversion of farmland or forestland to other kinds of land uses. Therefore, no impact would occur.

b) **No Impact.** Williamson Act contracts are formed between a county or city and a landowner for the purposes of restricting specific parcels of land to agricultural preserve areas. The Project site does not contain any agricultural uses nor is it zoned for agricultural use. No active Williamson Act contracts pertain to the Project site. Therefore, no impact would occur.

c) **No Impact.** The Project site is developed and located in an urbanized area of the City of Signal Hill with no timberland resources onsite. The Project site has a zoning designation of OC – Office Commercial, and a General Plan land use designation of 3.3 – Commercial Office. Both land uses do not allow for forest land or timberland production. Therefore, the proposed Project would not conflict with existing zoning or cause rezoning of forest land. Therefore, no impact would occur.

d) **No Impact.** As previously discussed, no forest lands occur within the City of Signal Hill. Therefore, the proposed Project would not result in the loss of forest land or conversion of forest land to non-forest use and no impact would occur.

e) **No Impact.** No agricultural or farmland occurs on the site. The Project site is zoned OC – Office Commercial, and a General Plan land use designation of 3.3 – Commercial Office, and no forest lands, farmland or agricultural uses are allowed. Therefore, the proposed Project would not involve changes in the existing environment which would result in conversion of farmland to non-agricultural use or the conversion of forest lands to non-forest use. Therefore, no impact would occur.

4.3 – 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. Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations.

Would the project:

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
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 non-attainment under an applicable federal or state ambient air quality standard?	☐	☐	☑	☐
c) Expose sensitive receptors to substantial pollutant concentrations	☐	☐	☐	☑
d) Result in other emissions (such as those leading to odors adversely affecting a substantial number of people?	☐	☐	☐	☑

a) **No Impact.** The City of Signal Hill is located within the South Coast Air Basin (Basin) under the jurisdiction of the South Coast Air Quality Management District (SCAQMD). SCAQMD and the Southern California Association of Governments (SCAG) are responsible for formulating and implementing the Air Quality Management Plan (AQMP) for the Basin. The AQMP is a series of plans for the purpose of reaching short-and long-term goals for those pollutants for which the Basin is designated as a "nonattainment" area because it does not meet Federal and/or State Ambient Air Quality Standards (AAQS). To determine consistency between a project and the AQMP, the project must comply with all applicable SCAQMD rules and regulations, comply with all proposed or adopted control measures, and be consistent with the growth forecasts utilized in preparation of the Plan. A significant impact could occur if the proposed Project conflicts with or obstructs implementation of the South Coast Air Basin 2016 AQMP. Conflicts and obstructions that hinder implementation of the AQMP can delay efforts to meet attainment deadlines for criteria pollutants and maintaining existing compliance with applicable air quality standards. Pursuant to the methodology provided in Chapter 12 of the 1993 SCAQMD CEQA Air Quality Handbook, consistency with the South Coast Air Basin 2016 AQMP is affirmed when a project meets the following:

1. does not increase the frequency or severity of an air quality standards violation or cause a new violation and

2. is consistent with the growth assumptions in the AQMP.

As discussed in Section 4.3 (b) below, the proposed Project would not increase the frequency or severity of an air quality standards violation. The proposed Project does not include any housing or demolition of housing and would not generate any population increase. The Project would result in a negligible increase in employment. Based on Criteria 1 and 2 the proposed Project is consistent with the AQMP; therefore, no impact would occur.

b) **Less Than Significant Impact.** A project may have a significant impact if project-related emissions will exceed Federal, State, or regional standards or thresholds, or if project-related emissions will substantially contribute to existing or project air quality violations. A *Focused Traffic Impact Assessment*, dated May 23, 2022, was prepared for the proposed Project by Linscott, Law and Greenspan (LLG) (See Appendix B) to evaluate potential air quality impacts from the proposed Project. The proposed Project is located within the South Coast Air Basin. Efforts to attain State or Federal air quality standards are governed by the SCAQMD. Both the State and Federal governments have established health based ambient air quality standards (AAQS). The SCAQMD has prepared the AQMP to set forth a comprehensive and integrated program that would lead the Basin into compliance with the Federal 24-hour $PM_{2.5}$ (particulate matter less than 2.5 microns in size) air quality standard and to provide an update to the SCAQMD's commitments toward meeting the Federal 8-hour ozone standards. The Basin is currently in non-attainment standards for State, Federal criteria pollutants ozone, nitrogen dioxide, and fine particulate matter ($PM_{2.5 \text{ and }} PM_{10}$).[4]

Construction Emissions

The proposed Master Plan Update does not include any physical alterations to the existing site condition. As such, the Project would not result in any construction-related criteria pollutant emissions and would not exceed any daily thresholds established by SCAQMD.

Operational Emissions

AUHS currently has an enrollment of 180 total students, of which 70 students are on campus. Under the proposed Master Plan Update, AUHS anticipates that enrollment will increase to 470 total students, of which 231 would be on campus. These changes would correspond with a net increase of 290 total students, and an increase of 161 students on campus. In addition, the number of on-campus faculty and staff would increase from 27 to 63, a net increase of 36 faculty and staff on the site. All the additional programs of study would occur within the existing buildings on the site. No physical alterations to the site or surrounding area are proposed. No demolition, ground-disturbing, or construction activities are proposed and no additional building square footage or parking is proposed as part of the Master Plan Update. According to the *Focused Traffic Impact Assessment*, the increase in students on campus would result in a net increase of approximately 80 daily trips, with 8 trips produced in the AM peak hour and 9 trips produced in the PM peak hour on a "typical" weekday. Projects that generate or attract fewer than 110 trips per day generally may be assumed to cause a less than significant transportation impact. The Project would result in a small increase in criteria pollutant emissions over existing conditions as a result of the increase in students and employees on the site during operation. However, the Project's net increase in operational emissions over existing conditions are expected to be negligible and would not result in an exceedance of any SCAQMD daily operational threshold. As such, long-term, operational emissions from the proposed Project are not anticipated to contribute considerably to any potential cumulative air quality impact. Therefore, impacts would be less than significant.

c) **No Impact.** Sensitive receptors include uses occupied by children or the elderly such as hospitals, parks, schools, and residential homes. Schools and universities such as AUHS do not emit pollutants during operation. Because there would be no construction-related emissions, operational emissions

would not exceed any SCAQMD daily threshold, and because the Project would not result in the emission of any pollutants, no impact would occur.

d) **No Impact.** According to the CEQA Air Quality Handbook, land uses associated with odor complaints include agricultural operations, wastewater treatment plants, landfills, and certain industrial operations such as manufacturing uses that produce chemicals, and paper. Odors are associated with industrial projects including the use of chemicals, solvents, petroleum products, and other strong-smelling elements used in manufacturing process, as well as sewage treatment facilities and landfills. The continued use of the Project site as an educational facility would not include any of the above noted uses or processes; therefore, no impact would occur.

4.4 – Biological Resources

Would the project:

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	☐	☐	☐	☑
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the California Department of Fish and Game or US Fish and Wildlife Service?	☐	☐	☐	☑
c) Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	☐	☐	☐	☑
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	☐	☐	☐	☑
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☐	☐	☐	☑

f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	☐	☐	☐	☑

a) **No Impact.** The City of Signal Hill is a mostly built out, urbanized area with limited to no natural habitat for special status species. The Project site is a developed site within an urbanized area of the City. The site does not contain any natural habitat, and plant life on the Project site is limited to ornamental trees and landscaping. The proposed Master Plan Update does not include any physical alterations to the existing site condition. The proposed Project would not change the existing environment in a manner that would result in a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service. For these reasons, no impact would occur.

b) **No Impact.** A significant impact would occur if the proposed Project would have a substantial adverse effect on any riparian habitat or other sensitive natural community. As discussed above, the Project site is a developed site within an urbanized area of the City. The site does not contain any natural habitat, and plant life on the Project site is limited to ornamental trees and landscaping. According to the United States National Wetlands Inventory (NWI), no riparian habitat or other sensitive natural community identified by the California Department of Fish and Wildlife or US Fish and Wildlife Service occurs on the Project site.[5] The proposed Master Plan Update does not include any physical alterations to the existing site condition. Therefore, the proposed Project would not have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in any local or regional plans, policies regulations or by the CDFW or by the U.S. Fish and Wildlife Service, and no impact would occur.

c) **No Impact.** A significant impact would occur if state or federally protected wetlands would be modified or removed as a result of the proposed Project. The proposed Project would not have any effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means. The Project site is currently developed and is located in a fully urbanized area and the Project does not proposed any physical alterations to the site or surrounding area. Therefore, no impact would occur.

d) **No Impact.** The Project site is a developed site within an urbanized area of the City. The site does not contain any natural or riparian habitat, and plant life on the Project site is limited to ornamental trees and landscaping. The proposed Master Plan Update does not include any physical alterations to the existing site condition. The proposed Project would not change the existing environment in a manner that would result in impacts to any sensitive habitat areas or interference with the movement of any native resident or migratory wildlife species. No riparian habitat occurs on the Project site; therefore, the Project would not interfere with any fish populations. Furthermore, no native wildlife nurseries occur on the Project site. Native avian species may occupy urban sites; however, the proposed Project would not remove or disturb any trees or landscaping. Therefore, the proposed Project would not interfere with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors or impede the use of native wildlife nursery sites. No impact will occur.

e) **No Impact.** The proposed Master Plan Update would not result in the removal or disturbance of any trees. As such, the proposed Project would have no impact.

f) **No Impact.** No native habitat exists on the fully developed Project site. The Project site is not located in an area that would be subject to any Habitat Conservation Plans or Natural Community Conservation Plan. Therefore, the proposed project would not conflict with the provisions of any adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan. No impact will occur.

4.5 – Cultural Resources

Would the project:

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
a) Cause a substantial adverse change in the significance of a historical resource as defined in 15064.5?	☐	☐	☐	☑
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to 15064.5?	☐	☐	☐	☑
C) Disturb any human remains, including those interred outside of formal cemeteries?	☐	☐	☐	☑

a) **No Impact.** A significant impact would occur if the proposed project would cause a substantial adverse change in the significance of a historical resource. There are no historic resources listed in the California Register of Historical Resources pursuant to in Section 15064.5 on, adjacent to, or in proximity to the Project site. The proposed Project site is currently fully developed with a university campus, and the proposed Project does not propose to change the local historic designations of any recognized historical sites or structures. The proposed Master Plan Update does not include any physical alterations to the existing site condition. Therefore, no impact would occur.

b) **No Impact.** A significant impact would occur if a known or unknown archaeological resource would be removed, altered, or destroyed as a result of the proposed Project. The Project site has been previously disturbed during development of the existing university that currently operates on the site. The proposed Master Plan Update does not include any physical alterations to the existing site condition, and no ground-disturbing activities would occur. Therefore, there would be no potential for uncovering archaeological resources, and impacts to archaeological resources would not occur.

c) **No Impact.** A significant impact would occur if previously interred human remains would be disturbed during excavation of the Project site. As previously discussed, no ground-disturbing activities would be required of the Project. Because the Project would not involve ground-disturbing activities, impacts to buried human remains would not occur.

4.6 – Energy

Would the project:

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
a) Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?	☐	☐	☑	☐
b) Conflict with or obstruct a state of local plan for renewable energy or energy efficiency?	☐	☐	☐	☑

a) **Less than Significant Impact.** The main forms of available energy supply are electricity, natural gas, and oil. The proposed Project, a comprehensive master plan for the AUHS campus, would be subject to all applicable Federal, State, and local building regulations, including the California Building Code (CBC) as approved by the Signal Hill Building Safety Division. The proposed Master Plan Update does not include any physical alterations to the Project site, and no demolition or construction activities will occur as a result of the proposed Project. Therefore, construction-related energy impacts would not occur. Electricity would continue to be provided to the AUHS campus by Southern California Edison (SCE), which obtains its energy supplies from power plants and natural gas fields in southern California, as well as from energy purchased outside its service area and delivered through high voltage transmission lines and pipelines. Power is generated from various sources, including fossil fuel, hydroelectric, nuclear, wind, and geothermal plants; and is fed into the electrical grid system serving Southern California. SCE is subject to California's Renewables Portfolio Standard, which was established in 2002 under Senate Bill 1078, accelerated in 2006 under Senate Bill 107, and expanded in 2011 under Senate Bill 2. This program requires investor-owned utilities, electric service providers, and community choice aggregators to increase procurement from eligible renewable energy resources to 33 percent of total procurement by 2020. According to the CPUC, as of 2017, SCE already provided 32% of its retail electricity from renewable energy resources.[6] As such, the AUHS campus's electricity source is expected to be produced and utilized in an efficient manner. Energy, in the form of fossil fuels, would also be used to fuel vehicles traveling to and from the campus during regular school hours. However, the potential increase in daily passenger vehicle trips that could occur as a result of the Project would be nominal, and would not result in a potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources. The proposed Project would not result in the use of large amounts of energy or use of energy in a wasteful manner. Therefore, operational impacts will be less than significant impact.

b) **No Impact.** The Signal Hill General Plan does not include any goals or policies related to renewable energy or energy efficiency. The proposed Master Plan Update does not include any physical alterations to the campus facilities, or programs that would result in conflicts with local plans. Recent tenant improvements to the existing AUHS campus facilities were completed pursuant to the California Building Code (CBC) and California Green Building Standards Code (CGBSC), which was confirmed through the City's plan review process. As such, the proposed Project would not conflict with or obstruct a state or local plan for renewable energy or energy efficiency. No impact will occur.

4.7 – Geology and Soils

Would the project:

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:				
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.	☐	☐	☐	☑
ii) Strong seismic ground shaking?	☐	☐	☑	☐
iii) Seismic-related ground failure, including liquefaction?	☐	☐	☐	☑
iv) Landslides?	☐	☐	☐	☑
b) Result in substantial soil erosion or the loss of topsoil?	☐	☐	☐	☑
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?	☐	☐	☐	☑
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1997), creating substantial direct or indirect risks to life or property?	☐	☐	☐	☑
e) Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of waste water?	☐	☐	☐	☑

f) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	☐	☐	☑

a.i) **No Impact.** The City of Signal Hill is located in a seismically active region of Southern California. Multiple Alquist-Priolo Earthquake Fault Zones have been identified in the City of Signal Hill, as identified by the State Department of Conservation and in the Signal Hill General Plan Safety Element.[7, 8] Locally, the Newport-Inglewood Fault System cuts diagonally across Signal Hill. This is the most significant seismic feature in the area and is considered seismically active. Since the Newport-Inglewood Fault System is active, it has been designated as an Alquist-Priolo zone. Within the Newport-Inglewood Fault System, five faults have been identified in and in the immediate vicinity of Signal Hill: the Cherry Hill Fault, Pickler Fault, Northeast Flank Fault, Reservoir Hill Fault, and Wardlow Fault. These faults are generally in a northwest-to-southeast alignment. The Newport-Inglewood Fault System is a nearly linear alignment of faults extending 45 miles along the southwestern side of the Los Angeles basin. It can be traced as a series of topographic hills, ridges, and mesas from the Santa Monica Mountains to Newport Beach, where it trends offshore. Structures along the zone of deformation act as groundwater barriers and, at greater depths, as petroleum traps. Continuing seismic activity has been evidenced most prominently by the 1920 Inglewood and 1933 Long Beach earthquakes. The City of Signal Hill complies with the Alquist-Priolo Earthquake Fault Zoning Act of 1972 through Signal Hill Municipal Code (SHMC) Chapter 15.04 (Building Code). The SHMC requires an engineering geology report be prepared for all projects within Alquist-Priolo zones, as well as other areas when deemed necessary by the City Engineer. Before projects can be permitted, the geologic investigation must demonstrate that proposed buildings will not be constructed across active faults. Structures for human occupancy must be set back at least 50 feet from active faults. The evaluation and written report must be prepared by a registered geologist. The AUHS campus is not located within the Alquist-Priolo fault zone, which is located approximately 0.1 miles to the northeast of the campus. Furthermore, the campus recently underwent renovations and retrofitting. These improvements were completed subject to all applicable Federal, State, and local building code regulations, including the California Building Code (CBC) seismic standards as approved by the Signal Hill Building Safety Division and City approved construction permit. The addition of 161 new students and 36 new faculty and staff to the existing campus would not directly or indirectly cause potential adverse effects, including the risk of loss, injury, or death involving rupture of a known earthquake fault. No impact will occur.

a.ii) **Less Than Significant Impact.** A significant impact could occur if the proposed Master Plan Update would cause personal injury or death or result in property damage as a result of seismic ground shaking. As discussed above, the City is located in a region subject to violent ground shaking and heavy damage to property in potential earthquake scenarios. Compliance with existing local City building standards and other applicable seismic related design requirements is intended to reduce the potential for damage to occur as the result of rupture of known earthquake faults in the region. All construction in Signal Hill is required to occur in compliance with the most current CBC requirements. Recent renovations and retrofitting of the AUHS campus structures were completed in compliance with Federal, State, and local building code regulations, including the CBC seismic standards as approved by the Signal Hill Building Safety Division and City approved construction permit. While the potential for strong seismic activity is present throughout Southern California, the existing structures on the AUHS campus are considered structurally safe in the event of an earthquake, and the addition new students and employees to the campus would not directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving strong seismic ground shaking. Therefore, impacts would be less than significant.

a.iii) **No Impact.** Liquefaction is a phenomenon that occurs when soil undergoes transformation from a solid state to a liquefied condition due to the effects of increased pore-water pressure. This typically occurs where susceptible soils (particularly soils in the medium sand to silt range) are located over a high groundwater table. A high groundwater table is described as one within 50 feet of the surface. According to the City of Signal Hill General Plan Safety Element (Figure 5), the Project site is not located in an area of known liquefaction potential. In addition, the site is completely developed with a university and the proposed Master Plan Update does not include any physical alterations to the campus. Therefore, the proposed Project would not result in direct or indirect seismic-related ground failure including liquefaction, and would not expose people or structures to potential ground failure due to liquefaction.

a.iv) **No Impact.** Structures built below or on slopes subject to failure or landslides may expose people and structures to harm. The AUHS campus and surrounding area is in a flat, urbanized setting devoid of steep slopes. The Project site is not mapped in an area of potential earthquake-induced landslide movement on the State of California Seismic Hazards Zones Map or in the Signal Hill General Plan Safety Element (Figure 5). Therefore, the Project would not directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving landslides. No impact would occur.

b) **No Impact.** The AUHS campus is completely developed with structures, landscaping, and asphalt parking. The proposed Master Plan Update does not include any physical alterations to the AUHS campus and would not involve any ground-disturbing activities. Therefore, the proposed Project would not have the potential to expose superficial soils to wind and water erosion. Wind erosion and water erosion would also not occur for this reason. Therefore, impacts due to erosion of topsoil would not occur as a result of the proposed Master Plan Update.

c) **No Impact.** Lateral spreading of the ground surface during a seismic activity usually occurs along the weak shear zones within a liquefiable soil layer and has been observed to generally take place toward a free face (i.e., retaining wall, slope, or channel) and to lesser extent on ground surfaces with a very gentle slope. Liquefaction occurs when seismic waves pass through saturated granular soil, distorting its granular structure, and causing some of the empty spaces between granules to collapse. Due to the developed nature of the site and the urbanized character of the area, the potential for lateral spread occurring on or off the Project site is considered negligible. As described above, the AUHS campus is not subject to liquefaction hazards. Because the AUHS campus is completely developed with structures, landscaping, and asphalt parking, and the proposed Project does not include any ground-disturbing activities, it can be assumed the campus is not located on a geologic unit or soil that is unstable, or that would become unstable as a result of the Project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse. Therefore, no impact will occur.

d) **No Impact.** The proposed project would not be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1997). Moreover, because the Project site is currently developed, subsurface soils would have been excavated, and compacted in accordance with standard building code practices, including removal of any expansive or other non-engineered soils, no impacts related to expansive soils would occur. Therefore, no impact would occur.

e) **No Impact.** The AUHS campus is served by the municipal sewer system and would not require installation of septic tanks. Therefore, no impact would occur.

f) **No Impact.** The proposed Master Plan Update would not require any ground disturbing activities. Therefore, the proposed Project will not directly or indirectly result in the destruction of a unique paleontological resource or unique geologic feature. No impact will occur.

4.8 – Greenhouse Gas Emissions

Would the project:

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	☐	☐	☑	☐
b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	☐	☐	☑	☐

a) **Les than Significant Impact.** Greenhouse gases differ from other emissions in that they contribute to the "greenhouse effect." The proposed Master Plan Update would not create short-term construction-related greenhouse gas emissions because the Update does not include any physical changes to the campus that would require construction activities. However, the Update could potentially result in increases in long-term operation-related greenhouse gas emissions due to the fact that the number of students and employees on campus will increase. The CEQA Guidelines require lead agencies to adopt GHG thresholds of significance. When adopting these thresholds, the amended Guidelines allow lead agencies to consider thresholds of significance adopted or recommended by other public agencies, or recommended by experts, provided that the thresholds are supported by substantial evidence, and/or to develop their own significance threshold. Neither the City nor SCAQMD has officially adopted a quantitative threshold value for determining the significance of GHG emissions that will be generated by projects under CEQA. SCAQMD published the Draft Guidance Document – Interim CEQA Greenhouse Gas (GHG) Significance Threshold in October 2008.[9] SCAQMD convened a GHG CEQA Significance Threshold Stakeholder Working Group beginning in April of 2008 to examine alternatives for establishing quantitative GHG thresholds within the district's jurisdiction. The Working Group proposed a tiered screening methodology for assessing the potential significance of GHG emissions generated by CEQA projects. The tiered screening methodology was outlined in the minutes of the final Working Group meeting on September 28, 2010.[10]

For the purposes of this environmental assessment, the interim Tier III screening threshold value of 3,000 $MTCO_2e$ per year is the most appropriate comparison value for impacts determination based on the non-industrial use comprising the proposed Project. The CEQA Guidelines require a lead agency to make a good-faith effort based, to the extent possible, on scientific and factual data to describe, calculate, or estimate the amount of GHG emissions resulting from a project. Operational emissions associated with an increase of students and employees on the AUHS campus during normal school hours would include GHG emissions from mobile sources (transportation), water use and treatment, waste disposal, and electricity. However, given that there would be no construction activities associated with the proposed Master Plan Update and the relatively nominal increase in on-campus students and employees that would occur as a result of the Update, it can be reasonably assumed that greenhouse

gas emissions associated with the Project would not exceed SCAQMD's proposed 3,000 MTCO2E threshold for non-industrial uses. Therefore, impacts would be less than significant.

b) **Less than Significant Impact.** The City has adopted the 2016 edition of the CBC, including the California Green Building Standards Code. Continued operation of the existing AUHS campus is subject to the California Green Building Standards Code. Recent renovations and retrofitting that occurred on the existing AUHS campus structures were completed in compliance with the Green Building Standards. The City of Signal Hill does not have any additional adopted plans, policies, standards, or regulations related to climate change and GHG emissions. The Project would generate GHG emissions, directly and indirectly, from a variety of sources which would all emit GHG emissions during operation. The project's consistency with AB 32 and SB 32 are discussed below.

AB 32 Consistency. Assembly Bill 32 (AB 32) was adopted in 2006 and requires California to reduce its GHG emissions to 1990 levels by 2020. The California Air Resources Board (CARB) identified reduction measures to achieve this goal as set forth in the CARB Scoping Plan. Thus, projects that are consistent with the CARB Scoping Plan are also consistent with AB 32 goal. The CARB Scoping Plan includes strategies for implementation at the statewide level to meet the goals of AB 32. These strategies serve as statewide measures to reduce GHG emissions levels. The Project would not be subject to the applicable measures established in the Scoping Plan because these measures are implemented at the state level. Therefore, the Project would not conflict or otherwise interfere with implementation of AB 32.

SB 32 Consistency. Senate Bill 32 (SB 32) was adopted in 2016 and requires the state to reduce statewide GHG emissions 40 percent below 1990 levels by 2030. SB 32 codifies the reduction target issued in Executive Order B-30-15. SB 32 builds upon the AB 32 goal of 1990 levels by 2020 and provides an interim goal to achieving Executive Order S-3-05's 2050 reduction goal of 80 percent below 1990 levels. The CARB 2017 Scoping Plan identified reduction measures to achieve the SB 32 GHG reduction goal. Like the previously adopted Scoping Plans, the 2017 Scoping Plan includes statewide reduction measures that are implemented at the state level. The proposed Project would not be subject to the applicable measures established in the 2017 Scoping Plan because these measures are implemented at the state level.

Additionally, the 2014 Scoping Plan Update indicates "California is on track to meet the near-term 2020 greenhouse gas limit and is well positioned to maintain and continue reductions beyond 2020 as required by AB 32"; and it recognizes the potential for California to "reduce emissions by 2030 to levels squarely in line with those needed in the developed world and to stay on track to reduce emissions to 80 percent below 1990 levels by 2050."

Moreover, the Project does not propose facilities or operations that would substantively interfere with any future County-mandated, state-mandated, or federally-mandated regulations enacted or promulgated to legally require development to assist in meeting state-adopted GHG emissions reduction targets, including those established under Executive Order S-3-05, Executive Order B-30-15, SB 32, or the 2017 Scoping Plan. Therefore, the Project would not conflict with implementation of SB 32 or otherwise interfere with implementation of this or future goals. Impacts will be less than significant.

4.9 – Hazards and Hazardous Materials

Would the project:

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	☐	☐	☑	☐
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	☐	☐	☑	☐
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☐	☐	☑	☐
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	☐	☐	☐	☑
e) For a project located within 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 result in a safety hazard or excessive noise for people residing or working in the project area?	☐	☐	☑	☐
f) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☐	☐	☑
g) Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires?	☐	☐	☐	☑

a) **Less Than Significant Impact.** The proposed Master Plan Update will not result in the transport, use of disposal of significant amounts of hazardous materials requiring special control measures. Thus, the Project will not have a significant impact on the public or the environment through the routine transport, use, or disposal of hazardous materials. The proposed Project does not include any physical alterations to the site and, therefore, will not require excavation activities and will not result in the need for soil removal from the site. All materials used in the treatment of patients, and any waste generated during operation, will be handled according to existing federal, state, and City regulations regarding hazardous materials handling and disposal. Therefore, the Project will not create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials.

b) **Less Than Significant Impact.** The proposed Master Plan Update will not result in any physical changes to the AUHS campus and will not require any construction or demolition activities that could potentially release hazardous materials into the environment. As discussed in response 4.9.a, all materials used in the treatment of patients, and any waste generated during operation, will be handled according to existing federal, state, and City regulations regarding hazardous materials handling and disposal. Therefore, the Project will not create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment. Impacts will be less than significant.

c) **Less Than Significant Impact.** There are multiple schools in close proximity to the Project site: Nelson Middle School, located approximately 0.1 miles southeast of the Project site; Signal Hill Elementary School, located approximately 0.02 miles northeast of the site; and Alvarado Elementary School, which is located approximately 0.06 miles south of the site. However, these schools would not be subject to any hazardous waste as a result of implementation of the proposed Master Plan Update. Continued use of the campus for health science education and medical care will not generate any hazardous emissions, or storage, handling, production or disposal of acutely hazardous waste. The AUHS campus does not utilize hazardous materials or produce hazardous wastes. No demolition of existing structures would be necessary that would expose persons to asbestos or other hazardous materials. Therefore, the proposed Project would not emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school.

d) **No Impact.** The Project site is not located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5.[11] Therefore, the proposed Project would not create a significant hazard to the public or the environment.

e) **Less than Significant Impact.** Long Beach International Airport is located less than two miles to the northeast of the AUHS campus and the Project site is located within FAA Part 77 – Transitional Surface for the airport. However, the Project site is developed with an existing university campus. The proposed Master Plan update would result in an increase in the number of students and employees on the Project site. However, the proposed Project does not include any physical alterations to the campus and would not result in a change in the use of the site. In addition, the Project site is not located within a noise hazard contour for the airport. Therefore, the Project would not result in a safety hazard or excessive noise for people residing or working in the Project area. Impacts will be less than significant.

f) **No Impact.** The proposed Master Plan Update does not include any physical alterations to the Project site or the surrounding area, and no changes to the existing transportation circulation system or an existing emergency response plan or evacuation plan would occur as a result of the Project. Therefore, no impact would occur.

g) **No Impact.** As noted by CALFIRE Fire Hazard Severity Zone Maps, the Project site is not located in an area of high fire threat.[12] Furthermore, the Signal Hill General Plan Safety Element (Figure 7) does not identify the Project site as being within or near a wildland fire hazard severity zone. Therefore, the Project would not expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires.

4.10 – Hydrology and Water Quality

Would the project:

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?	☐	☐	☐	☑
b) Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?	☐	☐	☑	☐
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or through the addition of impervious surfaces, in a manner which would:	☐	☐	☐	☑
i) result in substantial erosion or siltation on-or off-site;	☐	☐	☐	☑
ii) substantially increase the rate or amount of surface runoff in a manner which would result in flooding on-or-offsite;	☐	☐	☐	☑
iii) create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or	☐	☐	☐	☑
iv) Impede or redirect flood flows?	☐	☐	☐	☑
d) In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?	☐	☐	☐	☑
e) Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?	☐	☐	☐	☑

a) **No Impact.** The proposed Project does not include any physical alterations to the Project site or surrounding area. The Project does not include any earth-moving, grading, or construction activities that could result in violations of any water quality standards or waste discharge requirements. Due to the lack of grading, earth-moving activities, or construction as part of the proposed Master Plan Update, the Project would not violate any water quality standard or waste discharge requirement or otherwise substantially degrade surface or ground water quality. No impact would occur.

b) **Less than Significant Impact.** The proposed Master Plan Update would result in an increase in water use on the AUHS campus; however, this increase would be nominal. The Project site is paved and provides little to no infiltration of water into groundwater aquifers. The Project site does not support any groundwater production systems, and the addition of students and employees to the university would not interfere with the operation of any production system. The Project would not include any ground-disturbing activities and would not substantially decrease groundwater supplies or interfere substantially with groundwater recharge. The Project would not change the amount of existing impervious surface area and would not have a substantial impact on groundwater recharge. Therefore, no impact would occur.

c) **No Impact.** The Project site is fully developed and surrounded by areas that are developed. No streams or water resource features occur on the Project site. The Project does not include any earth moving, grading, or construction activities. Therefore, the proposed Project would not substantially alter the existing drainage pattern of the site or area, including through the alteration of a course, stream or river, or through the addition of impervious surfaces. As such, no impact would occur.

i) **No Impact.** The Project does not include any earth moving, grading, or construction activities. No native soil would be disturbed, and no ground-disturbing activities would occur. Therefore, the proposed Project would have no impact on erosion or siltation.

ii) **No Impact.** The Project would not contribute to an increase in surface runoff as the Project site is currently comprised of mostly impervious surfaces. According to the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRMs), there are no special flood zones in the City of Signal Hill. As such, the Project site is not subject to flooding. The proposed Master Plan Update would not impede or redirect flood flows because no physical alterations to the site or surrounding area are proposed as part of the Project. Therefore, as no native soil is being replaced with an impermeable surface the project would not substantially increase the rate or amount of surface runoff in a manner which would result in flooding on-or-offsite. No impact would occur.

iii) **No Impact.** The Project site is located in a developed area with existing storm sewer drains. The Project does not include any earth moving, grading, or construction activities. The Project would not increase the amount of impervious surfaces. The Project site would not exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff. Therefore, the Project would result in no impact.

iv) **No Impact.** The proposed Project, a university Master Plan Update that does not include any construction activities, would not redirect flood flows. Therefore, no impact would occur.

d) **No Impact.** The proposed Project is not located in a tsunami or seiche zone. According to the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRMs), there are no special flood zones in the City of Signal Hill. As such, the Project site is not subject to flooding. Therefore, the Project would not risk release of pollutants due to project inundation. No impact would occur.

e) **No Impact.** As mentioned above, there are no special flood zones in the City of Signal Hill. As such, the Project site is not subject to flooding. The Project would result in a nominal increase in water use during operation. However, the Project would not conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan because there are no physical alterations to the site that are proposed as part of the Master Plan Update. The university facility will continue to be subject to all applicable water quality controls, and will not increase impervious surface that could interfere with groundwater recharge. Therefore, the Project would not result in a significant impact.

4.11 – Land Use and Planning

Would the project:

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Physically divide an established community?	☐	☐	☐	☑
b) Cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?	☐	☐	☐	☑

a) **No Impact.** The proposed Master Plan Update would not physically divide the surrounding community since the proposed Project would not obstruct or in any way change access to the existing community. The Project site is an existing university use and would not impact any roadways or traffic circulation patters within the existing community. The proposed Project would not create any barriers to access to a community or require removal of any housing. As such, the proposed Project would have no impact.

b) **No Impact.** The proposed Project consists of a Master Plan Update for the existing AUHS campus. The proposed Project does not include any physical alterations to the campus and would not include any construction activities. The proposed Project does not require a General Plan Amendment and would not conflict with any General Plan policies designed to protect the environment. Therefore, no impact will occur.

4.12 – Mineral Resources

Would the project:

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	☐	☐	☐	☑
b) Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, Specific Plan or other land use plan?	☐	☐	☐	☑

a) **No Impact.** A significant impact would occur if the proposed Project resulted in the loss of a known mineral resource that would be of value to the region and the residents of the State. The Project site is currently developed with a university campus. Therefore, the proposed project would have no impacts associated with the loss of a mineral resource.

b) **No Impact.** A significant impact would occur if the proposed Project resulted in the loss of a locally important mineral resource recovery site. The Project site is currently developed with a university campus. The proposed Project would not result in the loss of availability of a locally important mineral resource recovery site. Therefore, the proposed project would have no impacts associated with a locally important mineral resource recover site.

4.13 – Noise

Would the project result in:

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) 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 ordinance, or applicable standards of other agencies?	☐	☐	☑	☐
b) Generation of excessive groundborne vibration or groundborne noise levels?	☐	☐	☐	☑
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?	☐	☐	☑	☐

Noise can be defined as unwanted sound which consists of energy waves that people receive and interpret. Sound pressure levels are described in logarithmic units or ratios of sound pressures to a reference pressure, squared. These units are called *bels*. To account for the range of sound that human hearing perceives, a modified scale is utilized known as the A-weighted decibel (dBA). Since the decibels are logarithmic units, sound pressure levels cannot be added or subtracted by ordinary arithmetic means. Typically doubling the traffic volume on a street or the speed of the traffic will increase the traffic noise level by 3-dBA. A 3-dBA change in sound is the beginning at which humans generally notice a barely perceptible change in sound, and a 5-dBA change is generally readily perceptible.[13]

a) **Less than Significant Impact.** The Project site is located in an urbanized area of the City of Signal Hill. The existing ambient noise levels near the Project site are primarily generated by traffic noise from local streets and Interstate 405 (I-405). Noise from Long Beach Airport is also discernable at the Project site. The Project site does not contain any discernable stationary noise sources. There are sensitive receptors in close proximity to the Project site; with residential uses surrounding the site on all sides. The proposed Master Plan Update would not include any short-term construction-related noise because the Project does not include any physical alterations to the AUHS campus. The proposed Project would result in an increase in the number of students and employees on the campus during regular school hours. However, the potential increase in students and employees on campus during regular school hours is not anticipated to result in a doubling of traffic volumes on local streets, and the Project is not anticipated to result in an increase in traffic noise of 3 dBA. Therefore, the potential increase in students and employees would not result in a perceptible increase in noise in the area. Continued long-term

operation of the campus would not result in exposure of sensitive receptors to noise levels that exceed the standards of the Municipal Code, nor would long-term operation of the campus exceed ambient noise level conditions. Therefore, impacts would be less than significant.

b) **No Impact.** Vibration is the movement of mass over time. It is described in terms of frequency and amplitude and unlike sound there is no standard way of measuring and reporting amplitude. Vibration can be described in units of velocity (inches per second) or discussed in decibel (dB) units in order to compress the range of numbers required to describe vibration. Vibration impacts to buildings are generally discussed in terms of peak particle velocity (PPV) which describes particle movement over time (in terms of physical displacement of mass). For purposes of this analysis, PPV is used to describe all vibration for ease of reading and comparison. Vibration can impact people, structures, and sensitive equipment.[14] The primary concern related to vibration and people is the potential to annoy those working and residing in the area. Vibration with high enough amplitude can damage structures (such as crack plaster or destroy windows). Groundborne vibration can also disrupt the use of sensitive medical and scientific instruments such as electron microscopes. Common sources of vibration within communities include construction activities and railroads. The proposed Master Plan Update would not result in any demolition, earth-moving, or construction activities. Therefore, the proposed Project is not anticipated to result in vibration impacts from construction. Additionally, the existing educational use does not generate any groundborne vibration. Therefore, no impact will occur as a result of the proposed Project.

c) **Less than Significant Impact.** As detailed in response 4.9.e, Long Beach International Airport is located less than two miles to the northeast of the AUHS campus and the Project site is located within FAA Part 77 – Transitional Surface for the airport. However, the Project site is developed with an existing university campus. The proposed Master Plan update would result in an increase in the number of students and employees on the Project site. However, the proposed Project does not include any physical alterations to the campus and would not result in a change in the use of the site. In addition, the Project site is not located within a noise hazard contour for the airport. Therefore, the Project would not expose people residing or working in the Project area to excessive noise levels. Impacts will be less than significant.

4.14 – Population and Housing

Would the project:

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Induce substantial unplanned population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	☐	☐	☐	☑
b) Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☑

a) **No Impact.** The proposed Master Plan Update does not call for the establishment of any new housing. The Project does not propose the extension of any roads or other infrastructure. The proposed Update has the potential to result in an increase in the number of on-campus students from 70 students to 231 students. This potential increase would likely come from the existing population in and around the Long Beach Metropolitan area, as it has since AUHS's founding in 1994. In addition, the potential increase from 27 to 63 on-campus faculty and staff that could result from the proposed Master Plan Update would also likely come from the existing population in the area. Therefore, the proposed Project would not induce substantial population growth in the City of Signal Hill. No impacts would occur.

b) **No Impact.** The proposed Master Plan Update does not include the removal of any housing; thus, no persons will be displaced as a result of the proposed Project. Therefore, no impact would occur related to displacement of people or housing.

4.15 – Public Services

Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Fire protection?	☐	☐	☑	☐
b) Police protection?	☐	☐	☑	☐
c) Schools?	☐	☐	☐	☑
d) Parks?	☐	☐	☑	☐
e) Other public facilities?	☐	☐	☐	☑

a) **Less than Significant Impact.** The AUHS campus is served by Los Angeles County Fire Station #60, located approximately 0.75 miles northeast of the Project site at 2300 East 27th Street. No new fire stations or other capital improvements would be needed to accommodate the potential increases in the number of students and employees on the AUHS campus as a result of the proposed Master Plan Update. In addition, no new fire personnel will need to be hired in order to maintain existing service ratios and response times, as the Project would not increase population or the need to service an increased population. Therefore, the proposed Project would have a less than significant impact on fire protection services.

b) **Less than Significant Impact.** The AUHS campus is served by the Signal Hill Police Department, located approximately 0.7 miles north of the Project site at 2745 Walnut Avenue. The proposed Project would not include any new uses that would require police protection services. The potential increase in on-campus students and employees that could result from the proposed Master Plan Update would not result in any need for additional police protection services. The proposed Project would not create new households that could increase usage of local and regional police facilities. Therefore, the Project would have a less than significant impact on police protection services.

c) **No Impact.** The proposed Project would not result in the construction of new housing or create a demand for new housing resulting in an increase in the school age student population In addition, the intent of the proposed Master Plan Update is to provide more school capacity in the area. Therefore, the proposed Project would not have an impact on schools.

d) **Less Than Significant.** The proposed Project would not generate new housing for residences that may increase the demand for new or existing park and or recreational facilities. The potential additional on-campus students and employees that could result from the proposed Master Plan Update are not

anticipated to significantly impact parks facilities.. Therefore, project impacts would be less than significant.

e) **No Impact.** The Project will not generate any new households or residences that might increase demand for other public facilities. The proposed Project would not include construction of any library facilities and would not require construction or improvement of any such facilities. In addition, the proposed Project would not create new households that could increase usage of local and regional library facilities. Therefore, no impact would occur.

4.16 – Recreation

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	☐	☐	☑	☐
b) Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	☐	☐	☐	☑

a) **Less Than Significant.** The proposed Master Plan Update will not result in the creation of new households and will not increase use of local and regional parks and recreational facilities. The Project's potential increase in on-campus students and employees would have a negligible increase in the use of parks and recreation facilities. Therefore, Project impacts would be less than significant.

b) **No Impact.** The Project does not include and will not result in the construction of any households nor would the Project remove or reduce recreational areas within the City of Signal Hill. The Project would not require construction or improvement of any offsite recreation facilities or the expansion of recreational facilities. Therefore, the Project would have no impact.

4.17 – Transportation

Would the project:

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Conflict with a program plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?	☐	☐	☑	☐
b) Would the project conflict or be inconsistent with CEQA Guidelines Section 15064.3, subdivision (b)	☐	☐	☑	☐
c) Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	☐	☐	☐	☑
d) Result in inadequate emergency access?	☐	☐	☐	☑

A *Focused Traffic Impact Assessment*, dated June 27, 2022, was prepared for the proposed Project by Linscott, Law and Greenspan (LLG) (See Appendix B). This section reflects the findings of LLG's report.

Background Information

Senate Bill 743 (SB 743), signed by the Governor in 2013, has changed the way transportation impacts are identified. Specifically, the legislation directed the Office of Planning and Research (OPR) to look at different metrics for identifying transportation as a California Environmental Quality Act (CEQA) impact. The Final OPR guidelines were released in December 2018 and identified Vehicle Miles Traveled (VMT) as the preferred metric moving forward. The Natural Resources Agency completed the rule making process to modify the CEQA guidelines in December of 2018. The CEQA Guidelines identify that, by July of 2020 all lead agencies must use VMT as the new transportation metric for identifying impacts for land use project. The City of Signal Hill has yet to adopt criteria for evaluating VMT impacts under CEQA. However, it is our understanding that the City of Signal Hill may likely utilize criteria consistent with the OPR Technical Advisory, and may be open to considering the criteria which has been adopted by neighboring jurisdiction of the City of Long Beach. It should be noted that CEQA requirements change as the CEQA Guidelines are periodically updated and/or legal opinions are rendered that change how analysis is completed. As such, the City may continually review the guidelines for applicability and consultants should contact the City to ensure that they are applying the City's most recent guidelines for project impact assessment.

<u>CEQA Changes</u>
A key element of the changes brought about by SB 743 is the elimination of auto delay, Level of Service (LOS) analysis, and other similar measures of vehicular capacity or traffic congestion as a basis for determining significant environmental impacts. This change is intended to assist in balancing the needs of congestion management with statewide goals related to infill development, promotion of public health

through active transportation, and reduction of greenhouse gas emissions. SB 743 includes amendments to current congestion management law that allows cities and counties to effectively opt-out of the LOS standards that would otherwise apply in areas where Congestion Management Plans (CMPs) are still used. Further, SB 743 required OPR to update the CEQA Guidelines and establish criteria for determining the significance of transportation impacts. In December 2018, OPR released their final recommended guidelines based on feedback from the public, public agencies, and various organizations and individuals. OPR recommended VMT as the most appropriate measure of project transportation impacts for land use projects and land use plans. For transportation projects, lead agencies may select their own preferred metric but must be prepared to support their decision with substantial evidence that complies with CEQA expectations. SB 743 does not prevent a city or county from continuing to analyze delay or LOS outside of CEQA review for other transportation planning or analysis purposes (i.e., general plans, impact fee programs, corridor studies, congestion mitigation, or ongoing network monitoring).

Level of Service Policy

The Circulation Element of the City's General Plan includes Policy 1.a, which requires that necessary circulation system enhancements and expansions occur concurrently with new development and are consistent with the Los Angeles County CMP. Per City of Signal Hill direction, existing traffic volumes for the three (3) key study intersections are derived from the Opening Year (Year 2020) With Project Peak Hour Turning Movement Volumes from the *Signal Hill Business Center Traffic Impact Analysis* (prepared by Kunzman Associates in July 2019). These Year 2020 AM and PM peak hour traffic volumes have been grown at the city-approved growth rate of one percent (1%) per year to establish Year 2021 existing traffic volumes (i.e., 1% total growth). Pursuant to the City of Signal Hill guidelines, existing AM and PM peak hour operating conditions for three (3) key study intersections were evaluated using the *Intersection Capacity Utilization* (ICU) methodology for signalized intersections and the *Highway Capacity Manual 6th Edition* (HCM 6) methodology for unsignalized intersections. Pursuant to the City of Long Beach guidelines, existing AM and PM peak hour operating conditions for the key signalized study intersections were evaluated using the HCM 6 methodology.

In conformance with City of Signal Hill and LA County CMP requirements, existing weekday peak hour operating conditions for the key signalized study intersections were evaluated using the ICU method. The ICU technique is intended for signalized intersection analysis and estimates the volume to capacity (V/C) relationship for an intersection based on the individual V/C ratios for key conflicting traffic movements. The ICU numerical value represents the percent signal (green) time, and thus capacity, required by existing and/or future traffic. It should be noted that the ICU methodology assumes uniform traffic distribution per intersection approach lane and optimal signal timing. Per LA County CMP requirements, the ICU calculations use a lane capacity of 1,600 vehicles per hour (vph) for left-turn, through-, and right-turn lanes, and dual left turn capacity of 2,880 vph. A clearance interval of 0.10 is also added to each Level of Service calculation. The ICU value translates to a Level of Service (LOS) estimate, which is a relative measure of the intersection performance. The ICU value is the sum of the critical volume to capacity ratios at an intersection; it is not intended to be indicative of the LOS of each of the individual turning movements. According to the City of Signal Hill significant impact criteria, impacts to local and regional transportation systems are considered significant if:

Signalized Intersections:

- Intersection with more than 40 project trips, and
- An unacceptable peak hour LOS (i.e., LOS E or F) at any of the key study intersections is projected. The City of Signal Hill considers LOS D (ICU = 0.801 - 0.900) to be the minimum acceptable LOS for all intersections, and

- The project increases traffic demand at the study intersection by 2% of capacity (ICU increase ≥ 0.020), causing or worsening LOS E or F (ICU > 0.901).
- Intersection left-turn queue lengths exceed the existing storage lengths.

Unsignalized Intersections:

- The project causes an intersection operating at LOS D or better to degrade to LOS E or F, and the traffic signal warrant analysis determines that a traffic signal is justified.

According to the City of Long Beach significant impact criteria, impacts to local and regional transportation systems are considered significant if:

Signalized Intersections:

- The project causes a study intersection to deteriorate from Level of Service (LOS) D to LOS E or F. The City of Long Beach considers LOS D to be the minimum acceptable LOS for all intersections; or
- The project increases average control delay at the study intersection by 2.5 seconds or more when an intersection is operating at LOS E or F in the baseline condition.
- The 95th percentile queue length exceeds the available storage length at any turn bay under project conditions.

Unsignalized Intersections:

- The intersection operates at LOS E or F, and the intersection meets the peak-hour traffic signal warrant after the addition of project traffic.

Analysis of Impacts

a) **Less than Significant Impact.** The proposed Master Plan Update would not result in any physical alterations to the AUHS campus and no construction activities of any kind would occur. As such, there would be no temporary construction-related traffic impacts. In order to estimate the operational traffic impact characteristics of the proposed Project, a multi-step process is utilized. The first step is traffic generation, which estimates the total arriving and departing traffic on a peak hour and daily basis. The traffic generation potential is forecast by applying the appropriate vehicle trip generation equations or rates to the Project development tabulation. The second step of the forecasting process is traffic distribution, which identifies the origins and destinations of inbound and outbound project traffic. These origins and destinations are typically based on demographics and existing/expected future travel patterns in the study area. The third step is traffic assignment, which involves the allocation of Project traffic to study area streets and intersections. Traffic assignment is typically based on minimization of travel time, which may or may not involve the shortest route, depending on prevailing operating conditions and travel speeds. Traffic distribution patterns are indicated by general percentage orientation, while traffic assignment allocates specific volume forecasts to individual roadway links and intersection turning movements throughout the study area. With the forecasting process complete and Project traffic assignments developed, the impact of the Project is isolated by comparing operational LOS conditions at selected key intersections and road segment using expected future traffic volumes with and without forecast Project traffic. The need for site-specific and/or cumulative local area traffic improvements can then be evaluated.

Project Trip Generation

Based on the application of ITE trip generation rates for "Junior Community College", and empirical trip rates from a prior LLG study for Orange Coast College in Costa Mesa, trip generation estimates were calculated for the existing and future student enrollment to estimate potential increases in trips due to the Project. As Table 2 (Project Trip Generation) indicates, the application of ITE and empirical trip rates for Junior/Community Colleges would result in a nominal increase in trips generated by the Project. A review of the middle portion of Table 2 indicates that the proposed Project, utilizing ITE trip rates, is forecast to generate a net increase of approximately 59 daily trips, with 5 trips (4 inbound, 1 outbound) produced in the AM peak hour and 5 trips (3 inbound, 2 outbound) produced in the PM peak hour on a "typical" weekday. Similarly, the proposed Project, utilizing empirical trip rates, is forecast to generate a net increase of approximately 65 daily trips, with 7 trips (6 inbound, 1 outbound) produced in the AM peak hour and 7 trips (4 inbound, 3 outbound) produced in the PM peak hour on a "typical" weekday. As a conservative step, the potential impact of the Project has been analyzed using the greater net increase in trips (i.e., utilizing the empirical trip rates; 7 trips during the AM peak hour and 7 trips during the PM peak hour).

Table 2
Project Trip Generation

Description	Daily	AM Peak Hour			PM Peak Hour		
		Enter	Exit	Total	Enter	Exit	Total
Trip Generation Factors:							
▪ ITE 540: Junior Community College (TE/Student)[5]	1.15	81%	19%	0.11	56%	4%	0.11
▪ Empirical Rate for OCC, Costa Mesa (TE/Student) [a]	1.271	0.107	0.018	0.125	0.076	0.065	0.141
ITE Project Trip Generation Forecast:							
▪ Future Enrollment (231 Students)	266	20	5	25	14	11	25
▪ Existing Enrollment (180 Students)	207	16	4	20	11	9	20
Net Increase in Trips:	**59**	**4**	**1**	**5**	**3**	**2**	**5**
Empirical Project Trip Generation Forecast:							
▪ Future Enrollment (231 Students)	294	25	4	29	18	15	33
▪ Existing Enrollment (180 Students)	229	19	3	22	14	12	26
Net Increase in Trips:	**65**	**6**	**1**	**7**	**4**	**3**	**7**

Notes:
▪ TE/Student = Trip end per student
[a] *Orange Coast College Vision 2020 Facilities Master Plan Traffic Impact Study*, prepared by LLG Engineers in June 2015

Project Trip Distribution and Assignment

Project traffic volumes both entering and exiting the site have been distributed and assigned to the adjacent street system based on the following considerations:

- the site's proximity to major traffic carriers and regional access routes,
- expected localized traffic flow patterns based on adjacent street channelization, and presence of traffic signals,
- existing traffic volumes, and
- ingress/egress availability at the Project site.

Table 3 (Project-Related Added Peak Hour Traffic Volumes) presents a summary of the project-related added peak hour traffic volumes at the three (3) study intersections, based the traffic generation forecast presented in Table 2, and indicates whether the project trips exceed either the City of Signal Hill's peak hour trip threshold of 40 trips or the City of Long Beach's peak hour trip threshold of 50 trips. Review of Table 3 shows that the three (3) intersections do not meet the peak hour trip threshold for analysis. However, they have been included in this analysis per the City's requirements to fully assess the potential impact in the immediate area of the Project.

Table 3
Project-Related Added Peak Hour Traffic Volumes

	Key Intersection	Jurisdiction	Time Period	Added Peak Hour Project Trips	Exceed City of Signal Hill "40 Peak Hour Trip" Threshold (Yes/No)	Exceed City of Long Beach "50 Peak Hour Trip" Threshold (Yes/No)
1.	Walnut Avenue at Hill Street	Signal Hill	AM	6	No	--
			PM	6	No	--
2.	Cherry Avenue at Hill Street	Signal Hill	AM	2	No	--
			PM	2	No	--
3.	Walnut Avenue at E. 20th Street/Alamitos Avenue	Signal Hill/ Long Beach	AM	2	No	No
			PM	3	No	No

Existing (Year 2021) Plus Project Capacity Analysis

Table 4 (Existing Plus Project Peak Hour Intersection Capacity Analysis) summarizes the peak hour level of service results at the three (3) key study intersections for Existing (Year 2021) Plus Project traffic conditions. Review of column (1) of Table 4 indicates that all of the key study intersections currently operate at LOS C or better during the weekday AM and PM peak hours. Review of columns (2) and (3) of Table 4 indicates that all of the key study intersections are forecast to operate at acceptable LOS C or better during the weekday AM and PM peak hours under Existing Plus Project traffic conditions.

General Plan Buildout (Year 2040) Plus Project Capacity Analysis

Table 5 (Year 2040 Buildout Plus Project Peak Hour Intersection Capacity Analysis) summarizes the peak hour level of service results at the three (3) key study intersections for General Plan Buildout (Year 2040) Plus Project traffic conditions. Review of column (2) of Table 5 indicates that all of the key study intersections are forecast to continue to operate at acceptable LOS C or better during the weekday AM and PM peak hours under General Plan Buildout (Year 2040) traffic conditions. Review of columns (3) and (4) of Table 5 indicates that all of the key study intersections are forecast to operate at acceptable LOS C or better during the weekday AM and PM peak hours under General Plan Buildout (Year 2040) Plus Project traffic conditions.

Table 4
Existing Plus Project Peak Hour Intersection Capacity Analysis

	Key Intersection	Jurisdiction	Time Period	(1) Existing Traffic Conditions				(2) Existing Plus Project Traffic Conditions				(3) Significant Impact				(4) Existing Plus Project Traffic Conditions with Improvements			
				ICU	LOS	Delay (s/v)	LOS	ICU	LOS	Delay (s/v)	LOS	ICU Increase	Yes/No	Delay Increase (s/v)	Yes/No	ICU	LOS	Delay (s/v)	LOS
1.	Walnut Avenue at Hill Street	Signal Hill	AM	--	--	15.8 s/v	C	--	--	16.0 s/v	C	--	--	0.2 s/v	No	--	--	--	--
			PM	--	--	14.5 s/v	B	--	--	14.6 s/v	B	--	--	0.1 s/v	No	--	--	--	--
2.	Cherry Avenue at Hill Street	Signal Hill	AM	0.622	B	--	--	0.622	B	--	--	0.000	No	--	--	--	--	--	--
			PM	0.678	B	--	--	0.679	B	--	--	0.001	No	--	--	--	--	--	--
3.	Walnut Avenue at E. 20th Street/Alamitos Avenue	Signal Hill/ Long Beach	AM	0.601	B	27.8 s/v	C	0.603	B	27.8 s/v	C	0.002	No	0.0 s/v	No	--	--	--	--
			PM	0.533	A	20.4 s/v	C	0.534	A	20.4 s/v	C	0.001	No	0.0 s/v	No	--	--	--	--

Notes:
- s/v = seconds per vehicle (delay)

Table 5
Year 2040 Buildout Plus Project Peak Hour Intersection Capacity Analysis

	Key Intersection	Jurisdiction	Time Period	(1) Existing Traffic Conditions				(2) Year 2040 Buildout Traffic Conditions				(3) Year 2040 Buildout Plus Project Traffic Conditions				(4) Significant Impact				(5) Year 2040 Buildout Plus Project Traffic Conditions with Improvements			
				ICU	LOS	Delay (s/v)	LOS	ICU	LOS	Delay (s/v)	LOS	ICU	LOS	Delay (s/v)	LOS	ICU Increase	Yes/No	Delay Increase (s/v)	Yes/No	ICU	LOS	Delay (s/v)	LOS
1.	Walnut Avenue at Hill Street	Signal Hill	AM	--	--	15.8 s/v	C	--	--	24.4 s/v	C	--	--	25.0 s/v	C	--	--	0.6 s/v	No	--	--	--	--
			PM	--	--	14.5 s/v	B	--	--	20.1 s/v	C	--	--	20.4 s/v	C	--	--	0.3 s/v	No	--	--	--	--
2.	Cherry Avenue at Hill Street	Signal Hill	AM	0.622	B	--	--	0.715	C	--	--	0.715	C	--	--	0.000	No	--	--	--	--	--	--
			PM	0.678	B	--	--	0.778	C	--	--	0.779	C	--	--	0.001	No	--	--	--	--	--	--
3.	Walnut Avenue at E. 20th Street/Alamitos Avenue	Signal Hill/ Long Beach	AM	0.601	B	27.8 s/v	C	0.666	B	31.7 s/v	C	0.668	B	31.8 s/v	C	0.002	No	0.1 s/v	No	--	--	--	--
			PM	0.533	A	20.4 s/v	C	0.586	A	21.5 s/v	C	0.586	A	21.5 s/v	C	0.000	No	0.0 s/v	No	--	--	--	--

Notes:
- s/v = seconds per vehicle (delay)

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Intersection Vehicle Queuing Analysis

Excessive left-turn vehicle queuing which extends into and/or blocks adjacent through travel lanes may have detrimental effects on intersection operations and the roadway network as a whole in ways not otherwise accounted for by the ICU methodology. Therefore, left-turn vehicle queuing at the two (2) signalized study intersections were evaluated in order to identify the effects of project traffic on left-turn queuing at the intersections. Additionally, to address the City's concerns, vehicle queueing at the one (1) unsignalized study intersection (Walnut Avenue at Hill Street) was also evaluated to ensure the queues do not impact the intersection of Gaviota Avenue at Hill Street (i.e., westbound approach queue). The left-turn vehicle queuing analysis was prepared utilizing the HCM methodology for signalized intersections using Vistro 2020 software. The HCM methodology considers traffic volume data, lane configurations, and traffic signal phasing in order to calculate the 95th percentile queues for the respective traffic movements. The 95th percentile queue represents the maximum back of vehicle queue with 95th percentile traffic volumes (i.e., actual traffic volumes will exceed the 95th percentile volumes 5 percent of the time) and is commonly used for design purposes. The left-turn vehicle queuing analysis was based on the forecast weekday AM and PM intersection turning movement volumes utilized in the level of service analyses. The existing left-turn lane configurations and storage lengths were determined based on a review of aerial maps of the subject intersections obtained from Google Earth and on field reviews conducted by LLG Engineers. A minimum vehicle length of 25 feet is assumed for purposes of this analysis. Table 6 (Existing Plus Project Peak Hour Intersection Queuing Analysis) presents the left-turn queueing analyses results for the three (3) study intersections. Column 1 presents the queuing results for existing traffic conditions. Column 2 presents the results for existing plus project traffic conditions. Table 7 (Year 2040 Buildout Plus Project Peak Hour Intersection Queuing Analysis) presents the left-turn queueing analyses results for the three (3) study intersections. Column 1 presents the queuing results for General Plan Buildout (Year 2040) traffic conditions. Column 2 presents the results for General Plan Buildout (Year 2040) Plus Project traffic conditions.

Table 6
Existing Plus Project Peak Hour Intersection Queuing Analysis

Key Intersection	Storage Provided (feet)	(1) Existing (Year 2021) Traffic Conditions				(2) Existing (Year 2021) Plus Project Traffic Conditions			
		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
		Max. Queue/ Min. Storage Required	Adequate Storage (Yes/No)	Max. Queue/ Min. Storage Required	Adequate Storage (Yes/No)	Max. Queue/ Min. Storage Required	Adequate Storage (Yes/No)	Max. Queue/ Min. Storage Required	Adequate Storage (Yes/No)
1. Walnut Avenue at Hill Street									
Westbound Left/Through/Right	280'	60'	Yes	37'	Yes	62'	Yes	37'	Yes
2. Cherry Avenue at Hill Street									
Northbound Left-Turn	200'	48'	Yes	57'	Yes	48'	Yes	57'	Yes
Southbound Left-Turn	190'	25'	Yes	25'	Yes	25'	Yes	25'	Yes
Eastbound Left/Through/Right	270'	198'	Yes	231'	Yes	198'	Yes	231'	Yes
Westbound Left/Through/Right	90'	29'	Yes	25'	Yes	29'	Yes	25'	Yes
3. Walnut Avenue at E. 20th Street/Alamitos Avenue									
Northbound Left-Turn	60'	52'	Yes	25'	Yes	52'	Yes	25'	Yes
Southbound Left-Turn	60'	40'	Yes	25'	Yes	40'	Yes	25'	Yes
Eastbound Left/Through/Right	400'	311'	Yes	171'	Yes	311'	Yes	171'	Yes
Westbound Left/Through/Right	330'	206'	Yes	98'	Yes	206'	Yes	98'	Yes

Table 7
Year 2040 Buildout Plus Project Peak Hour Intersection Queuing Analysis

Key Intersection	Storage Provided (feet)	(1) Year 2040 Buildout Traffic Conditions				(2) Year 2040 Buildout Plus Project Traffic Conditions			
		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
		Max. Queue/ Min. Storage Required	Adequate Storage (Yes/No)	Max. Queue/ Min. Storage Required	Adequate Storage (Yes/No)	Max. Queue/ Min. Storage Required	Adequate Storage (Yes/No)	Max. Queue/ Min. Storage Required	Adequate Storage (Yes/No)
1. Walnut Avenue at Hill Street									
Westbound Left/Through/Right	280'	94'	Yes	55'	Yes	97'	Yes	56'	Yes
2. Cherry Avenue at Hill Street									
Northbound Left-Turn	200'	56'	Yes	68'	Yes	56'	Yes	68'	Yes
Southbound Left-Turn	190'	25'	Yes	31'	Yes	25'	Yes	31'	Yes
Eastbound Left/Through/Right	270'	222'	Yes	256'	Yes	222'	Yes	257'	Yes
Westbound Left/Through/Right	90'	35'	Yes	25'	Yes	35'	Yes	25'	Yes
3. Walnut Avenue at E. 20th Street/Alamitos Avenue									
Northbound Left-Turn	60'	73'	Yes [a]	25'	Yes	73'	Yes [a]	25'	Yes
Southbound Left-Turn	60'	57'	Yes	25'	Yes	57'	Yes	25'	Yes
Eastbound Left/Through/Right	400'	370'	Yes	198'	Yes	370'	Yes	198'	Yes
Westbound Left/Through/Right	330'	232'	Yes	116'	Yes	232'	Yes	116'	Yes

Notes:
[a] = The excess storage can be contained within the existing 55-foot transition (i.e. 115 feet of total storage).

Existing (Year 2021) Traffic Conditions
Review of Column 1 of Table 6 indicates that the three (3) study intersections have queues that are adequately accommodated by the existing storage space.

Existing (Year 2021) Plus Project Traffic Conditions
Review of Column 2 of Table 6 indicates that the three (3) study intersections have queues that are adequately accommodated by the existing storage space.

General Plan Buildout (Year 2040) Traffic Conditions
Review of Column 1 of Table 7 indicates that the three (3) study intersections have queues that are adequately accommodated by the existing storage space.

General Plan Buildout (Year 2040) Plus Project Traffic Conditions
Review of Column 2 of Table 7 indicates that the three (3) study intersections have queues that are adequately accommodated by the existing storage space.

Site Distance Analysis
In support of evaluating the Project's site access, a sight line assessment was prepared to validate the adequacy of sight lines at the Project's four (4) driveways located along Walnut Avenue. The line of sight evaluation was prepared according to the general engineering practices for stopping sight distance analysis as documented in the State of California Department of Transportation (Caltrans) *Highway Design Manual (HDM).* This assessment is based on the intersection sight distance requirements as published in the Caltrans *HDM* and focuses on the sight distance requirements for the Project's driveways located along Walnut Avenue. The Sight Distance Evaluation prepared for the proposed driveways was based on the criteria and procedures set forth by the California Department of Transportation (Caltrans) in the State's *Highway Design Manual* for "Private Road Intersections".

The *Highway Design Manual (HDM)*U*,* in Section 405.1(2)(c), page 400-22, indicates that for Private Road Intersections, "The minimum corner sight distance shall be equal to the stopping sight distance as given in Table 201.1...", where stopping sight distance is defined as the distance required by the driver of a vehicle, traveling at a given speed, to bring his vehicle to a stop after an object on the road becomes visible. Stopping sight distance is measured from the driver's eyes, which are assumed to be 3.5 feet above the pavement surface, to an object 0.5-foot high on the roadway. The speed used in determining stopping sight distance is defined as the "critical speed" or 85th percentile speed which is the speed at which 85% of the vehicles are traveling at or less. The critical speed is the single most important factor in determining stopping sight distance. Table 201.1 in the HDM is used in determining stopping sight distance based on the critical speed of vehicles on the affected roadway. For this analysis, a design speed of 30 miles per hour (mph) for Walnut Avenue, which is the existing posted speed limit for these roadways, was utilized. Using Table 201.1, titled *Sight Distance Standards,* in the State's *HDM* for stopping, a minimum stopping sight distance of 200 feet is required. To provide a conservative assessment, the "corner sight distance" criteria in Section 405.1(2)(b) of the *HDM* was also utilized. Based on the criteria set forth in Table 405.1A of the *HDM* and a posted speed limit of 30 mph on Walnut Avenue, a corner sight distance of 331 feet is required for exiting vehicles looking right (i.e., left-turning vehicles) and 287 feet is required for exiting vehicles looking left (i.e., left-turning and right-turning vehicles). Figures 11 and 12 of LLG's Traffic study illustrate a schematic of the sight distance evaluation for the four (4) Project driveways along Walnut Avenue. These figures illustrate the limited use areas. Review of Figures 11 and 12 indicate that sight distances at the four (4) Project Driveways along Walnut Avenue are expected to be adequate if obstructions within the sight triangles are minimized.

Conclusions

The proposed Project, utilizing empirical rates, is forecast to generate a net increase of approximately 59 daily trips, with 5 trips (4 inbound, 1 outbound) produced in the AM peak hour and 5 trips (3 inbound, 2 outbound) produced in the PM peak hour on a "typical" weekday. As a conservative step, the potential impact of the Project has been analyzed using the greater net increase in trips (i.e., utilizing the empirical trip rates; 7 trips during the AM peak hour and 7 trips during the PM peak hour). All of the key study intersections are forecast to operate at acceptable LOS C or better during the weekday AM and PM peak hours under Existing (Year 2021) Plus Project and General Plan Buildout (Year 2040) Plus Project traffic conditions. The three (3) study intersections have queues that are adequately accommodated by the existing storage space. The sight distances at the four (4) Project Driveways along Walnut Avenue are expected to be adequate if obstructions within the sight triangles are minimized. Therefore, the proposed Master Plan Update would not conflict with a program plan, ordinance or policy addressing the circulation system and impacts will be less than significant.

b) **Less than Significant Impact.** The Traffic study prepared by LLG analyzed the Vehicle Miles Traveled (VMT) for the proposed Project based on Senate Bill 743 (SB 743) requirements consistent with the *Technical Advisory on Evaluating Transportation Impacts In California Environmental Quality Act* (CEQA), December 2018, prepared by the State of California Governor's Office of Planning and Research (OPR). The OPR Technical Advisory provides project screening criteria and guidance for analysis of VMT assessments under SB 743. With the adopted guidelines, transportation impacts are to be evaluated based on a project's effect on vehicle miles traveled. Lead agencies are allowed to continue using their current impact criteria, or to opt into the revised transportation guidelines. However, the new guidelines must be used starting July 1, 2020, as required in CEQA section 15064.3.

The City of Signal Hill has yet to adopt criteria for evaluating VMT impacts under CEQA. However, it is understood that the City of Signal Hill may likely utilize criteria consistent with the OPR Technical Advisory, and may be open to considering the criteria which has been adopted by neighboring jurisdiction of the City of Long Beach.

For the VMT screening analysis, the presumption of less than significant impact near Transit Stations was applied to the proposed Project. Proposed CEQA Guideline Section 5064.3, subdivision (b), states that “generally, [land use] projects within one-half mile of either an existing major transit stop or an existing high-quality transit corridor should be presumed to cause a less than significant transportation impact”. A high-quality transit corridor is defined as a corridor with fixed route bus service with service intervals no longer than 15 minutes during peak commute hours. Review of the Long Beach Transit Priority Areas Map from the *City of Long Beach Traffic Impact Analysis Guidelines dated June 2020* shows the Project falls within half a mile from high quality transit corridor or major transit stop. Since the proposed Project is considered to be located within half a mile of an existing high-quality transit corridor, this project can be screened from further VMT analysis and can be presumed to have a less than significant impact on VMT.

In addition, screening for small projects was also applied to the proposed Project. Consistent with the OPR Technical Advisory Section E.1 *Threshold for Small Projects*, projects that generate or attract fewer than 110 trips per day generally may be assumed to cause a less than significant transportation impact. Based on the trip generation estimates presented in Table 2, the proposed Project is forecast to generate 65 daily trips which is less than 110 daily trip threshold for small projects. As such the Project can be screened from further VMT analysis and can be presumed to have a less than significant impact on VMT.

c) **No Impact.** The proposed Project would not include any construction activities or physical alterations to the site or surrounding area that could substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment). No impact will occur.

d) **No Impact.** The proposed Master Plan Update does not require any construction activities or physical alterations to the site that could result in inadequate emergency access. Therefore, the Project will have no impact with regard to emergency access.

4.18 – Tribal Cultural Resources

Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code Section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a Cultural Native American tribe, and that is:

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Listed or eligible for listing in the California Register of Historical resources, or in a local register of historical resources as defined in Public Resources Code Section 5020.1(k), or	☐	☐	☐	☑
b) 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 Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resource Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.	☐	☐	☐	☑

a) **No Impact.** A significant impact would occur if the proposed Project would cause a substantial adverse change in the significance of a tribal cultural resource listed or eligible for listing in the California Resources of Historical Resources, or in a local register of historical resources as defined in Public Resources Code Section 5020.1(k). The Project site is currently developed, and there are no historic resources on, adjacent to, or in proximity to the project site listed in the California Register of Historical Resources pursuant to in Section 15064.5. The City does not have any landmarks listed under its historic preservation program as defined in Public Resources Code Section 5020.1(k). However, in compliance with Assembly Bill 52, Native American tribes traditionally and culturally affiliated with the geographic area of the Project site were notified of the proposed Project on June 27, 2022. No responses were received, and no consultation was requested by any of the tribes. Therefore, because the proposed Project would not include any ground disturbing activities and no tribes requested consultation the proposed Project will have no impact.

b) **No Impact.** A resource is 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 Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resource Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.

Assembly Bill (AB) 52

Assembly Bill (AB) 52 specifies that a project that may cause a substantial adverse change to a defined Tribal Cultural Resource (TCR) may result in a significant effect on the environment. AB 52 requires tribes interested in development projects within a traditionally and culturally affiliated geographic area to notify a lead agency of such interest and to request notification of future projects subject to CEQA prior to determining if a negative declaration, mitigated negative declaration, or environmental impact report is required for a project. The lead agency is then required within 14 days of deeming a development application subject to CEQA complete to notify the requesting tribe, and invite the tribe consult on the project. AB 52 identifies examples of mitigation measures that will avoid or minimize impacts to TCR.

Pursuant to California AB 52, Native American Tribes that previously requested the City to notify them about projects of interest were given a 30-day notice to request consultation regarding the Project on June 27, 2022. A notification list is maintained by the City of Signal Hill and tribes requesting notification were sent notification via certified mail by the City of Signal Hill. The 30-day period concluded on July 26, 2022 and no requests for consultation were received.

A significant impact would occur if the proposed Project would cause a substantial adverse change in the significance of a tribal cultural resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in Public Resources Code Section 5024.1(c). As discussed above, Native American tribes affiliated with the geographic area of the Project site were notified of the proposed Project and no responses were received from any of the tribes. Because the proposed Project would not include any ground disturbing activities and no tribes requested consultation the proposed Project will have no impact.

4.19 – Utilities and Service Systems

Would the project:

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
a) Require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects?	☐	☐	☑	☐
b) Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry, and multiple dry years?	☐	☐	☑	☐
c) Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	☐	☐	☑	☐
d) Generate solid waste in excess of State or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?	☐	☐	☑	☐
e) Comply with federal, state, and local management and reduction statutes and regulations related to solid waste?	☐	☐	☑	☐

a) **Less Than Significant Impact.** The City operates its own municipal water supply and distribution system, which provides water service to the AUHS campus and the rest of the City of Signal Hill. The City of Signal Hill Water Department operates a system with four (4) pressure zones that distributes water to customers throughout the City of Signal Hill limits. The City limits and City water service area are approximately the same. Primary sources of water to the City are imported water from Metropolitan Water District of Southern California (MWD) and groundwater pumped from Central Groundwater Basin, through City owned and operated Well No. 7, Well No. 8, and Well No. 9. The City utilizes chloramination to treat water supplies. Water from Well No. 7 and Well No. 8 is treated and then enters the system through the Gundry Reservoir, which acts as a forebay to the rest of the system. Well No. 9 water is

treated at the site by passing through a 3-stage nano-filtration system followed by a liquid granular activated carbon (LGAC) treatment. Then the water is pumped directly into the system from a clearwell. Imported water enters the system through a pressure regulating station and directly serves Zone 1 of the system. There are two other storage reservoirs, namely Temple Reservoir and Hilltop Reservoir. Water is conveyed through approximately 50 miles of transmission and distribution pipeline to 3,123 customers. The water system consists of four pressure zones (Zone I, II, III, and IIIA). Zone IIIA is served water through a pressure regulating station. The water system consists of the following facilities: 50 miles of pipe, 4-inches to 20-inches in diameter; 3 Storage Reservoirs (Gundry, Temple, Hilltop) with a total capacity of 7.3 MG; 3 Wells (Well No. 7, 8, and 9) with a total capacity of 3,585 gpm; 3 Booster Pump Stations (Gundry, Temple, Hilltop); 2 Pressure Regulating Stations (Walnut and Zone 3A); 1 Imported Water Connection (CB-19), maximum capacity of 7.5 cfs or 3,366 gpm; 2 Groundwater Treatment Facilities; and 2 Emergency Interconnections (Lakewood and Long Beach Water Department). The proposed Master Plan Update, and the potential increase in students and employees on the AUHS campus, would not substantially increase water use in the City of Signal Hill because the potential increase in on-campus students and employees is considered negligible. The Master Plan Update would not alter or impact any existing water or wastewater treatment facilities, and would not substantially increase demand so as to require expansion of existing or new facilities. Impacts would be less than significant.

Regarding wastewater facilities, the potential increase in wastewater that could result from implementation of the proposed Master Plan Update would be well within the treatment capacity of MWD's treatment plants. Impacts will be less than significant.

No new connections to local water and sewer mains would occur as a result of the Project. Impacts are not anticipated to either sewer lines or treatment facilities that serve the AUHS campus, as the Project involves a negligible increase in the number of people using the existing campus. Therefore, the project will result in less than significant impacts as a result of new or expanded wastewater treatment facilities.

Potentially significant impacts could occur as a result of this project if storm water runoff was increased to a level that would require construction of new storm drainage facilities. As discussed in the Hydrology section, the proposed Master Plan Update does not include any physical alterations to the site or surrounding area and would not generate substantially increased runoff from the site that would require construction of new storm drainage facilities. This is due to the fact that the Project will not increase the amount of impermeable surfaces. As such, the proposed project would not require the construction of new facilities or expansion of existing storm drainage facilities. Impacts would be less than significant.

Electricity is provided by Southern California Edison. Natural Gas is provided by Long Beach Gas. Telecommunications is provided by Frontier Communications and Spectrum. The proposed Project is accounted for in the City's General Plan, Land Use Element and Zoning Code and will have sufficient electric power, natural gas, and telecommunications capacity available. Impacts will be less than significant.

b) **Less than Significant Impact.** According to the City's 2020 Urban Water Management Plan, the City's groundwater right of 2,022 AFY is in the Central Basin Aquifer, and the City's existing potable water demand is currently 1,918 AFY.[15] Based on analysis of historical rainfall data and associated demands, the City anticipates that there will be a surplus of supply during all average, single dry years, and multiple dry years (up to 5 years) that may occur in the future, and no drastic action is expected to be needed as long as typical water supplies are available. Therefore, even under the condition of not being able to access groundwater carryover rights, the City is expected to have enough supply to meet the demands during the drought years. In addition, in response to the current extreme drought conditions throughout California, MWD's Board of Directors declared a Water Supply Alert in August

2021, calling for consumers and businesses to voluntarily reduce their water use and help preserve the region's storage reserves. The AUHS campus is actively pursuing and implementing water conservation measures in order to voluntarily reduce its water use. The proposed Master Plan Update would likely generate a negligible increase in additional demand for water, relative to overall existing citywide demand. As the Urban Water Management Plan anticipates an overall increase in demand associated with development in the area over 2010 conditions, and the water demand for this project is within that demand assumption, impacts would be less than significant. There are sufficient water supplies in the City to meet the Project's estimated water demand. The Project would not substantially deplete water supplies, and the Project would have a less than significant impact on entitled water supplies.

c) **Less than Significant Impact.** As detailed in Sections 4.19a and 4.19b, the proposed Project will be adequately served by existing facilities. Therefore, a less than significant impact would occur.

d) **Less than Significant Impact.** Significant impacts could occur if the proposed Master Plan Update led to an exceedance of the existing permitted landfill capacity or violates federal, state, and local statutes and regulations. Regional landfill capacity fluctuates daily and is regularly monitored by the County Sanitation Districts of Los Angeles County to ensure there is sufficient landfill space available to dispose of municipal solid wastes. The City of Signal Hill exclusively contracts with EDCO Disposal for refuse and recycling collections services. All City residents, businesses, and developers are required to use EDCO for the collection of regular trash, recyclables, and debris. This includes the AUHS campus. EDCO disposes of waste at several area landfills in the Southern California region. The proposed Master Plan Update would not lead to a significant increase in the amount of solid waste generated at the AUHS campus. The Project would not generate solid waste in excess of State or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals. Impacts will be less than significant.

e) **Less than Significant Impact.** The AUHS campus is required to comply with all federal, state, and local management and reduction statutes and regulations related to solid waste. As such, the proposed Project would have a less than significant impact.

4.20 – Wildfire

If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project:

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
a) Substantially impair an adopted emergency response plan or emergency evacuation plan?	☐	☐	☐	☑
b) Due to slope, prevailing winds, and other factors, exacerbate wildlife risks, and thereby expose project occupants to, pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire?	☐	☐	☐	☑
c) Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk of that may result in temporary or ongoing impacts to the environment?	☐	☐	☐	☑
d) Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?	☐	☐	☐	☑

a) **No Impact.** As noted by CALFIRE Fire Hazard Severity Zone Maps, the Project site is not located in an area of high fire threat.[16] Furthermore, the Signal Hill General Plan Safety Element (Figure 7) does not identify the Project site as being within or near a wildland fire hazard severity zone. Therefore, the proposed Project would not substantially impair an adopted emergency response plan or emergency evacuation plan. No impact will occur.

b) **No Impact.** The Project site is located in a flat surface area with no steep hills or slopes. No native vegetation occurs on the Project site and though the project site would experience prevailing winds such as the Santa Ana winds, the proposed Project would not exacerbate wildfire risks. Therefore, no impact would occur.

c) **No Impact.** In accordance with Senate Bill No. 1241, the Director of Forestry and Fire Protection must identify areas in the State of California that are considered Very High Fire Hazard Severity Zones. Fire threats occur as a result of a combination of climate, topography, vegetation and developmental site characteristics. High fire hazard risks areas are found in areas adjoining the Santa Ana Mountains

and foothills. Development that encroaches upon wildland areas can expose occupants to a higher fire risk. The Project is not located in or near state responsibility areas or lands classified as very high fire hazard severity zones. The proposed Project would not result in wildfire impacts as the Project is located in a fully urbanized area. Finally, the site is not located in an area adjacent to wildlands. The Project would not require the installation or maintenance of associated infrastructure that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment. Therefore, no impact would occur.

d) **No Impact.** Wildland fires are defined as any non-structure fire, other than prescribed burns, that occur in an undeveloped or natural environment. Continued operation of the AUHS campus would not generate any known risk of wildfire. Furthermore, no residential uses are proposed. The proposed Master Plan Update would not expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire instability or drainage changes. Therefore, no impact would occur.

4.21 – Mandatory Findings of Significance

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Does the project have the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	☐	☐	☑	☐
b) Does the project have impacts that are individually limited, but cumulatively considerable?	☐	☐	☐	☑
c) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	☐	☐	☑	☐

a) **Less Than Significant Impact.** The proposed Master Plan Update would not impact any agricultural or forest resources, as discussed in Section 4.2. The Project site is located within an urbanized area with no natural habitat. The Project would not significantly impact any sensitive plants, plant communities, fish, wildlife, or habitat for any sensitive species as discussed in Section 4.4. Sections 4.5 and 4.18 conclude that impacts related to cultural and tribal cultural resources would not occur as a result of the proposed Master Plan Update. Section 4.7 concludes that impacts related to paleontological resources would not occur. The Project would not significantly impact the environment with concern to the routine transport of hazardous materials, as concluded in Section 4.9. Based on the preceding analysis of potential impacts in the responses to items 4.1 thru 4.20, no evidence is presented that this Project would degrade the quality of the environment. The City hereby finds that the proposed Master Plan Update does not have the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory. Impacts are less than significant.

b) **No Impact.** Cumulative impacts can result from the interactions of environmental changes resulting from one proposed project with other past, present, and future projects that affect the same resources.

As an example, impacts to utilities and infrastructure systems, public services, transportation network elements, air basin, watershed, or other physical conditions. Such impacts could be short-term and temporary, usually consisting of overlapping construction impacts, as well as long term, due to the permanent land use changes involved. Such impacts are expected to be less than significant for this Project due to the fact that there are no other similar projects taking place in the area. An increase in the number of students and employees on the AUHS campus will not substantially impact the environment. Therefore, no cumulative impacts would occur.

c) **Less Than Significant Impact.** Based on the analysis of the Project's impacts in the responses to Sections 4.1 thru 4.20 of the Initial Study, there are no indications that this Project could result in substantial adverse effects on the environment, including human beings. The Project does not include any construction activities; therefore, no short-term construction related impacts will occur. Long-term effects will include increases in the number of students and employees on the AUHS campus and associated increases in the use of public services and utilities. However, the potential increase in the number of students and employees at the existing university campus is considered negligible and would not lead to any significant impacts such that additional public services or utilities facilities would be required. With adherence to existing regulations, impacts related to public services and utilities will be less than significant. The analysis herein concludes that direct and indirect environmental effects will be less than significant.

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5 References

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5.2 – Persons and Organizations Consulted

- N/A

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AMERICAN UNIVERSITY OF HEALTH SCIENCES

COMPREHENSIVE MASTER PLAN

2022 - 2023

Attachment B

1600 E. Hill St., Signal Hill, CA 90755 | www.auhs.edu | 562.988.2278

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Section I: Executive Summary

A. Overview

American University of Health Sciences' strategic master planning speaks to our focus of being centered on student-learning, data driven towards decision-making, and engaged in global envisioning. As such, our instructional programs are designed to increase students' capacity for learning and service to community, as well as meet the needs of an increasingly diverse student population. In planning to meet the needs of undergraduate and graduate students, AUHS' academic programs and support services will be affected by various structural considerations such as the capability for building out additional classrooms, skills and laboratories, and outpatient clinics, equipped with necessary resources and technology to support specialized training and disciplines. The delivery of AUHS' academic programs and support services relates directly to the needs for facilities upgrades and improvements in learning systems/modalities, classrooms, and laboratories.

Enrollment growth is expected in the areas of School of Nursing and School of Pharmacy. A build out for the new outpatient pediatric and pharmacy services clinic will provide community the access to health care. AUHS faculty will enhance their involvement in research projects that impact the community, state, national, and international sectors. Sustaining our commitment to the academic research will require building out a research facility as well.

AUHS has established presence in Signal Hill in that it continues to support of bringing to life the vision of the City of Signal Hill to be the City of Health Care and Education. AUHS also made its presence in surrounding cities of Long Beach, Carson, Lakewood, Torrance, Cerritos, and

Bellflower. Plans for extended University programs, delivered online and off-campus campus, will augment AUHS presence beyond local cities and geographic state boundaries. Establishing partnerships with local institutions will provide access to university baccalaureate and graduate education in healthcare education by using their facility for classroom space for instruction.

Below reflects Timeline of the proposed Programs and Services.

Programs/Services	**Building Usage**	**Timeline**
School of Pharmacy - Doctor of Pharmacy	Building 3 To be used for classrooms, skills lab instructions and offices for the PharmD program	Summer 2022: Permits to build issued
Outpatient Pediatric Clinic	Building 1 – Second Floor To be used for outpatient pediatric clinic	Summer 2023: Permits to build pending plan preparation
Outpatient Pharmacy Clinic Services	Building 1 – Second Floor To be used for outpatient pharmacy services	Summer 2023: Permits to build pending plan preparation
American University Research Academy (AURA) STEAM Charter High School	Building 2	Fall 2022 or Spring 2023: Pending meeting of Zoning Ordinance Amendment as well as parking and traffic by the City of Signal Hill.

B. Existing Operations

The Institutional Academic Strategic Plan and Facility Development Strategic Plans have been prioritized in response to the following needs of AUHS:

1.0 **School of Nursing (SON)**: Located in Building 1, second and third floors, with 150 enrollment per year in the Bachelor of Science in Nursing (BSN). Operating 1-2 days

/week on campus, and 3 days off campus/week. Please see Expansion of programs offered in C-Phase I in this section.

2.0 **School of Pharmacy (SOP):** Located in Building 1, second and third floors, Bachelor of Science in Pharmaceutical Science (BSPS), Master of Science in Clinical Research (MSCR), and Doctor of Pharmacy (PharmD). Number of proposed enrolments: 25 Students per year. Projected operating schedule 2-4 days/week.

C. Phase I – Nursing School Expansion of Programs Offered:

C.1 – The School of Nursing Expansion of programs offered will not require renovation on physical facilities. New programs offered will include Master of Science in Nursing with specializations in Family Nursing Practice, Nursing Education, Organization and Leadership. These new programs are pending approvals from respective accrediting agencies, and proposed to start in Winter 2022. There will be no changes in facilities to start the MSN program.

Programs/Services	Building Usage	Timeline
Master of Science in Nursing	Current facilities	Fall 2022

D. Phase II – Doctor of Pharmacy Program (PharmD) – School of Pharmacy:

The Doctor of Pharmacy Program will occupy building 3 which renovation is underway. This building will house classrooms, skills lab, auditorium, offices, and clinical laboratory. Projected start of the first cohort is proposed for Spring 2023. Building 3 facilities will be shared with the School of Nursing, and classroom usage for other programs as needed.

Programs/Services	Building Usage	Timeline
School of Pharmacy - Doctor of Pharmacy	Building 3. To be used for classrooms, skills labs, and office.	Renovation complete: Summer 2022 Start of Operations: Fall 2022

E. Phase III - Outpatient Pediatric Clinic and Pharmacy Clinic

Through the provision of comprehensive care to pediatric patients, AUHS-OPedsC physicians, AUHS employed nurse practitioners, and pharmacists, will have the opportunity to refer and work with subspecialty physicians, including the on-site services by nutritionist and social worker. The provision of comprehensive care includes the treatment of infants, children, and adolescents, evaluation and monitoring of the healthy development and growth children, providing education and guidance, preventive health, immunizations.

As part of its ongoing efforts to improve patient's access to health care and related services, American University of Health Sciences (AUHS) is subsidizing the start-up and first year of operations of a new ***AUHS Outpatient Clinic Pharmacy Services*** to be housed at the University Campus located in Signal Hill. With the projected opening in 2023, the clinic will be owned by the AUHS founders Pastor Gregory Johnson and Kim Dang, and will be managed by a licensed pharmacist, pharmacy technician, and administrative staff.

Programs/Services	Current Usage	New Building Usage	Timeline
Outpatient Pediatric Clinic – Building 1 (Please see Exhibit A-1 - or A-2)	Building 1 – Second Floor – Gaviota entrance Skills Lab 2, Classrooms 206, 208 – for theory and skills instructions	Building 1 – Second Floor – Gaviota entrance To be used for outpatient Pharmacy and pediatric clinic, and patient rooms	Start of remodel: Spring 2023 Start of Operations: Fall 2023
Outpatient Pharmacy Clinic Building 1 (Please see Exhibit A)		Building 1 – Second Floor Gaviota entrance To be used for outpatient pharmacy services	Start of renovation: Spring 2023 Start of Operations: Fall 2023

Current usage for portion of Building 1, second floor, (Skills Lab 2, classrooms 206 and 208) where the clinics will be located will be moved to Building 3.

G. Phase IV - American University Research Academy (AURA) STEAM Private High School

With a projected start date in fall of 2022, American University Research Academy (AURA) Private High School will be an institution of learning where students of diverse background will be taught by a faculty whose real world and academic training will guide them on the road to rewarding careers in the medical sciences.

Curriculum will be developed with the guidance of the California Private Schools Association (CCSA) and STEAM. STEAM Education is an approach to learning that uses Science, Technology, Engineering, the Arts and Mathematics as access points for guiding student inquiry, dialogue, and critical thinking. The International Baccalaureate® (IB) is recognized worldwide as one of the most challenging academic programs — the “gold standard” in pre-university preparation — the IB focuses on skill development while preparing students to engage with an excellent curriculum.

Programs/Services	Building Usage	Timeline
American University Research Academy (AURA) STEAM Private High School	Building 2 – all facilities	Renovation: Completed Start of Operations: Fall 2022 or Spring 2023

H. Phase V– School of Medicine

Recognizing AUHS' long history in serving minority and underserved student population, the School of Medicine has been envisioned to continue transforming the lives of students as they provide excellent and compassionate care to their patients. The addition of the School of Medicine and training new generations of physicians will create a legacy that the founders, Pastor Gregory Johnson and Ms. Kim Dang, have grounded since 1994.

Exploring and Envisioning of the AUHS School of Medicine will include the development, but not limited to the following components and actions:

- Funding
- Accreditation requirements
- Physical facilities and resources
- Feasibility Study
- Develop task force
- Engage Community
- Consult with the City of Signal Hill
- Explore partnerships
- Marketing and recruitment plans

Section II: Mission and Vision, Core Values, Philosophy, and Statement of Faith

Purpose and Identity Statement

AUHS is a Christian-based, minority-serving university where the values of faith in God, love of humankind, and respect for all persons, irrespective of differences are embraced. The University is also a minority serving organization dedicated to providing high quality education to prepare underrepresented groups and others as competent and compassionate health care professionals and researchers.

Through this outreach, the University harnesses the talents and abilities of persons currently underrepresented in healthcare and research while improving the dissemination of culturally appropriate care.

A. American University of Health Sciences Mission Statement

The American University of Health Sciences' mission, vision, core values, and principles set the guidance and direction for the development and growth of its programs, and improvement of facilities in support of these programs. The following guides and directs AUHS in its development and growth as approved by the Board of Trustees.

B. Mission and Vision

American University of Health Sciences, a private Christian-based, minority- serving university of higher education, welcomes students of diverse backgrounds and prepares them to make a positive impact on society through the provision of exceptional quality patient-centered care within the context of a global perspective of the human condition.

This mission is accomplished through the creation of a strong and caring academic

environment where excellence, diversity, and the development of the entire person—mind, body and spirit—is addressed and where teaching/learning, research, service and scholarship is valued and supported.

C. Core Values

Inspired by a strong belief in God and the Christian values of love and caring for humankind, and of justice and respect, the University's core values include a holistic approach to education, promotion of the intellectual, analytical and critical thinking abilities of its students, evidence-based knowledge, and service to our fellow man, and a commitment to life-long learning.

- **Christian Values**

  Christian Values. Upon completion of the appropriate health science career program (i.e., nursing, pharmacy, pharmacy technician, clinical research, etc.) , students should be able to affect positive clients-patient outcomes by sharing their Christian Values of love, caring, justice and respect, as an advocate client-patient needs and rights.

- **Performance**

  Performance (Research/Scholarship) In the area of performance, graduates will demonstrate social, philosophical knowledge of their profession/career pathway (i.e., nursing, pharmacy, pharmacy technician, clinical research, etc).

- **Cultural Competence**

  Cultural competence (Diversity) In the area of cultural competence, graduates will deliver culturally competent, sensitive caring that is evidence-based in the appropriate health career Social Responsibility (Service) In the area of social responsibility,

graduates will develop social and personal responsibility for ongoing professional growth and development including higher education in the appropriate health career profession (i.e., nursing, pharmacy, pharmacy technician, clinical research, etc.) service area.

- **Social Responsibility**

  Social Responsibility (Service) In the area of social responsibility, graduates will develop social and personal responsibility for ongoing professional growth and development including higher education in the appropriate health career profession (i.e., nursing, pharmacy, pharmacy technician, clinical research, etc.)

- **Critical Thinking**

  Critical thinking (Academic Preparation/ Education) In the area of critical thinking, graduates will apply critical thinking as the theoretical and scientific underpinnings to the appropriate health career occupation (i.e., nursing, pharmacy, pharmacy technician, clinical research, etc.) to build a solid foundation to drive the profession forward.

D. Philosophy & Principles of the University

The objective of the University is to prepare a professional and culturally diverse workforce for the pharmaceutical, nursing and clinical research sectors within healthcare. As previously stated, one of our stated purposes is to create a workforce who will utilize research evidence-based practice to guide healthcare delivery. It is the mission and purpose of AUHS that these professionals will understand the application of research; display competencies to apply evidence- based practice and will have been infused with the desire to continue their education with the intent toward becoming practice professional leaders, future research scientists and

faculty within their professional domain.

To this end, the University upholds the following as its guiding principles and philosophies:

- The University adopts a holistic approach to education and promotes total development of mind, body, and spirit, while promoting the intellectual, analytical and critical abilities of its students, complemented with solid values such as service and commitment to life-long learning.
- All students must acquire the fundamental knowledge and understanding of science and how it relates to their individual domain—pharmacy, nursing, medicine—and appreciate how these disciplines have evolved, are integrally related, and are individually and collectively continually changing human life. The knowledge that students gain will not be limited to theories but instead will extend to actual clinical application, which will include clinical – laboratory – practice experiences, externships and community service.
- The University thrives in an intimate and quality learning environment, a place for creative individual expression as well as fruitful social interaction. The University harnesses a dynamic, enriching environment where students can freely interact with accomplished and dedicated faculty, who embrace and exemplify the values of the university, and utilize a rich array of library, internet, and interactive learning tools.
- The University recognizes its critical role in community development and social health service. It is aware that institutional success lies behind what its students and graduates give back to society. The University seeks to impress upon all its graduates the higher mission and noble privilege of community service and improving the quality of healthcare through both provision of care and scholarly study of the impact of that care.

- The University commits to continually develop and upgrade curricula and courseware to enable students and practitioners to stay up-to-date and conversant on prevailing practices and technologies affecting the health care industry.
- All graduates of the University will have an accurate understanding of how they, as practitioners in the field, fit into the larger and real-world community that they serve. Graduates will possess the competencies necessary to provide excellent care and service within their domain with a thorough foundation in science, social/behavioral, leadership, and interpersonal – interactional knowledge and skills.

E. Statement of Faith

American University of Health Sciences recognizes that there is a body of knowledge with which the humanities, the natural sciences, the social sciences, theology, and professional studies are to be differently but compatibly concerned.

We pursue truth in order to glorify the God and Father of our Lord Jesus Christ: praying for the continual outpouring of the Holy Spirit and the return of our Savior, the Lord Jesus Christ; remembering the promise of Scripture and tradition; keeping our hearts faithfully attuned to the voice of God; and being thoughtfully, acutely, and critically engaged.

American University of Health Sciences affirms a statement of faith that defines its doctrinal convictions as follows:

- We believe in one God, Creator of all things, holy, infinitely perfect, and eternally existing in a loving unity of three equally divine Persons: the Father, the Son and the Holy Spirit. Having limitless knowledge and sovereign power, God has graciously purposed from eternity to redeem a people for Himself and to make all things new for His own glory.

- We believe that the Old Testament and the New Testament Scriptures, given by plenary inspiration, contain all truth necessary to faith and Christian living.

- We believe that God created Adam and Eve in His image, but they sinned when tempted by Satan. In union with Adam, human beings are sinners by nature and by choice, alienated from God, and under His wrath. Only through God's saving work in Jesus Christ can we be rescued, reconciled and renewed.

- We believe that Jesus Christ is God's incarnate, fully God and fully man, one

- Person in two natures. Jesus—Israel's promised Messiah—was conceived

- through the Holy Spirit and born of the Virgin Mary. He lived a sinless life, was crucified under Pontius Pilate, arose bodily from the dead, ascended into heaven and sits at the right hand of God the Father as our High Priest and Advocate.

- We believe that Jesus Christ, as our representative and substitute, shed His blood on the cross as the perfect, all-sufficient sacrifice for our sins. His atoning death and victorious resurrection constitute the only ground for salvation.

- We believe that the Holy Spirit, in all that He does, glorifies the Lord Jesus Christ. He convicts the world of its guilt. He regenerates sinners, and in Him they are baptized into union with Christ and adopted as heirs in the family of God. He also indwells, illuminates, guides, equips and empowers believers for Christ-like living and service.

- We believe that God's justifying grace must not be separated from His sanctifying power and purpose. God commands us to love Him supremely and others sacrificially, and to live

out our faith with care for one another, compassion toward the poor and justice for the oppressed. With God's Word, the Spirit's power, and fervent prayer in Christ's name, we are to combat the spiritual forces of evil. In obedience to Christ's commission, we are to make disciples among all people, always bearing witness to the gospel in word and deed.

- We believe in the personal, bodily and glorious return of our Lord Jesus Christ with His holy angels when He will bring His kingdom to fulfillment and exercise His role as Judge of all. This coming of Christ, at a time known only to God, demands constant expectancy and, as our blessed hope, motivates the believer to godly living, sacrificial service and energetic mission.

- We believe that God commands everyone everywhere to believe the gospel by turning to Him in repentance and receiving the Lord Jesus Christ. We believe that God will raise the dead bodily and judge the world, assigning the unbeliever to condemnation and eternal conscious punishment and the believer to eternal blessedness and joy with the Lord in the in the new heaven and the earth, to the praise of his glorious grace.

- We believe that from the beginning of God's revelation to humankind. He revealed his order of creation and his purpose in creating man and woman. God ordain that traditional family is between a man and a woman.

Section III: Details and Plans

A. Existing Conditions (Entire Property)

1. Existing Details Narrative (Entire Property – Occupied and Vacant)

2. Existing Plans (Entire Property – Occupied and Vacant)

A.1 Existing Details Narrative:

Building 1 is a three-floor physical facility currently utilized **with a total 28,000 square footage space.**

Building Details Narrative: Building 1	Occupied	Vacant
Building 1: First Floor The following areas and resources are located on the first floor of building 1: *library, student break room, student lounge, Center for Academic Success (CAS), and Chapel.* ***Library*** provides the following resources: reading, media and computer, and printer/copier machine for students. The Library has 15 computers, a TV and a DVD combo player for students to watch and listen to audio and video resources. The spacious library holdings are composed of required textbooks for each course, journals, internet databases as research tools to access nursing, health, and relevant articles. The AUHS library subscribes to CINAHL with Full-Text, MEDLINE Complete, and JSTOR, which are available on and off-	Operations: Monday to Friday 8 :00 AM to 7:00 PM	No

Building Details Narrative: Building 1	Occupied	Vacant
campus 24/7. Access information for all databases can be found on the Library Resources page on Moodle. The library is managed by a director and library assistant. The ***Center for Academic Success (CAS***) is committed to maximizing the academic potential of each student by empowering them to move seamlessly throughout their educational program. The CAS is devoted to helping all students meet their individual goals regardless of age, gender, race or physical ability. The ***student lounge & Student break room*** are popular areas for students to commune and relax. The student lounge has copier machine available to students. Three additional rooms are designated for janitorial equipment, and storeroom. The university ***chapel*** is a communal blessed *a*rea where AUHS family gathers to share prayers and reflection, find faith, peace, inspiration, courage, and unity. Every Wednesday at noon, AUHS family comes together to share prayers and reflections that strengthen their Christian faith, belief in body, mind, and spirit.		

Building Details Narrative: Building 1	Occupied	Vacant
Building 1: Second Floor The second floor houses the following areas for academic and operational functions: *reception area, Board conference room, 2 laboratories (Skills and Pharmacy lab), office of the Admission with interview room, student open lounge area, office for the Student Nurses Association (SNA), and 3 smart classrooms.* The *Skills Laboratory 1* has 7 hospital beds, as well as other state of the art science skills equipment, such as Vita Simulators Laerdal IV simulation anatomical arms model and wall-mounted simulation examination set and suction equipment. *Pharmacy Skills Laboratory 2* has three (3) hospital beds, one (1) low fidelity mannequin, and one (1) crash/medication cart. One (1) observation room is currently use a medication room and would be used as a control room for simulation lab in the future. One locked room is designated for old student files, and archived documents.	Operations: Monday to Friday 8 :00 AM to 7:00 PM	No

Building Details Narrative: Building 1	Occupied	Vacant
Building 1: Third Floor The third floor has the following areas and resources: *15 faculty offices, 8 Executive Offices (Founders/Board of Trustees, President, VP/COO, CFO, Provost, Deans of SON and SOP, Asst. Dean) , 9 administrative and staff offices, 2 conference rooms (Faculty & Conference room 315), and an IT/computer server room.* One large office is designated for the Student Services staff. Part-time faculty members share a common office and full-time nursing faculty members have private individual offices. Administrative and staff offices are the following: Student Services, Student Affairs Director, Placement (Career Services), Marketing & Publication Director, IT Director, Accounts Payable, AUHS Foundation Director, Financial Aid Administration and Staff office. Other offices are designated for administrative personnel and IT. There are three areas where large scale printers are located as well as various other office machines. Inside the faculty conference room, there is Scantron machine, copy/print/scan machine and a large shredder.	Operations: Monday to Friday 8 :00 AM to 7:00 PM	No

Below are tables outlining the current numbers of facilities and areas utilized.

Table 1. Building 1 -First Floor:

Current	#	Sq.
Library	1	1742.50
Chapel	1	561
Student Break Room	1	2644.50
Student Lounge	1	1100
Office of Center for Academic Success	1	651
Media Access Room	1	(within the Library)
Computer Room	1	(within the Library)
Exit Doors	2	2 exit doors

Table 2. Building 1 – Second Floor:

Current	#	Sq.
Conference Room	1	858
Reception Area/Front Lobby	1	408
Nursing Skills Lab	1	612
Pharmacy Lab	1	360
Open Student Lounge	1	1100
Office of Student Nurses Association (SNA)	1	396
3 Classrooms: Room 203 Room 206 Room 208	 1 1 1	 396 1440 360
Admissions Office	1	152
Restroom Male	1	143
Restroom Female	1	320
Exit Doors	3	3 exit doors

Table 3. Building I – Third Floor:

Current	#	SQ
Faculty Offices	15	105 each
Executive Offices (Founders/Board of Trustees office, President, VP/COO, CFO, Provost, Deans (SON, SOP) and Asst. Dean	8	561 each
Administrative/Staff Offices	9	165 each
Conference Room	1	480
Faculty Conference Room	1	276
Computer Server Room	1	344
Restroom Female	1	165
Restroom Male	1	165
Restrooms	4	165 (1) 105 (3)

Current	#	SQ
Exit Doors	3	3 exit doors
Kitchen	1	105
Storage Room	1	27

Existing Details Narrative:

Building 2 is a two-story facility with **10,000 SF** situating two (2) conference rooms and spacious offices, cubicles, and conference rooms. Each floor has two restrooms. This building has bridge pathway access to Building 1 - 2nd floor.

Building Details Narrative: Building 2	Occupied	Vacant
Building 2. First Floor: Two (2) conference rooms are located on the first floor equipped with smart board and internet capabilities. There are two (2) multi-functional small offices, and open lounge/reception area.	No	Temporary use of classrooms
Building 2. Second Floor: Four cubicle offices will serve as student advising areas, adjacent to several offices. There are 13 offices located on the second floor. Through the bridge pathways from the second floor of building 1, and building 3, the reception area, and these offices could be accessed. Additional areas located on the second floor are: employee kitchen, 2 restrooms, and a file room.	No	

Below are tables outlining the current numbers of facilities and areas utilized.

Table 1. Building 2. First Floor:

Current	#	SQFT.
Conference Room 1 with Smart Board	1	500
Conference Room 2 with Smart Board	1	320
Test Lab	2	320
Restroom Female	1	96
Restroom Male	1	105
Lobby	1	Open area to hallway
Exit Doors	2	Exit doors

Table 2. Building 2. Second Floor:

Current	#	SQFT.
Administrative Offices	13	692 each
Modular Staff Offices	4	130 each
File Room	1	135
Exit Doors	2	2 exit doors
Restroom Female	1	110
Restroom Male	1	120
Electrical room	1	110
Kitchen	1	110

Existing Details Narrative:

Building 3: Building 3 is a three-story building with **34,000 SF**.

Building Details Narrative: Building 3	Occupied	Vacant
Building 3. First to third Floors A concept plan for the renovation for classrooms, offices, and simulation skills/research laboratories for the School of Pharmacy and School of Nursing has been approved. This building has the capacity for additional classrooms and learning resources that could support future AUHS future programs and projects.	No	Renovation 99% complete. Awaiting final inspection by LA County Fire and the City of Signal Hill.

BUILDING 3: EXISTING SQUARE FOOTAGE

OCCUPANT LOAD TABULATIONS/ EGRESS/ REQUIRED EXITS

Location/ Occupancy	Area S.F.	Occupants Factor (CBC/ IBC Table 1004.1.1)	Occupants	Egress Req: CBC/ IBC TABLES 1004.1.1 AND 1015.1 Office–"B" 2 Exits ≥ 49 Conference 2 Exits ≥ 49 Assembly 2 Exits ≥ 49		Egress Width Req: CBC/ IBC 1005.1 Stairways: 0.3"/Person Other Egress Components: 0.2"/Person	
				Required	Provided	Required	Provided
FIRST FLOOR							
Office (B)	3,769 S.F.	100	38	–	–		
Lab Suite 1 (B)	3,343 S.F.	100	33	–	–		
Lab Suite 2 (B)	2,102 S.F.	100	21	–	–		
Class Room	501 S.F.	20	25	–	–		
Meeting Room	232 S.F.	15	15	–	–		
Accessory "Stor.,Stairs"	1,338 S.F.	300	4	–	–		
						Door Width:	
Total First Floor	11,285 S.F.	–	136	2	3	27.2"	156"
SECOND FLOOR							
Office (B)	3,283 S.F.	100	33	–	–		
Meeting/Training (A)	3,080 S.F.	FIX	56	–	–		
Library/ Reading Area	1,314 S.F.	50	26	–	–		
Class Rooms (A)	2,038 S.F.	15	136	–	–		
Accessory "Stor.,Stairs"	1,156 S.F.	300	4	–	–		
						Stair Width:	
Total Second Floor	10,871 S.F.	–	255	2	3	76.5"	125.5"
THIRD FLOOR							
Office (B)	3,837 S.F.	100	38	–	–		
Meeting RM./Training	3,080 S.F.	FIX	56	–	–		
Meeting RM.	981 S.F.	15	65	–	–		
Lab "Simulation" (B)	1,716 S.F.	100	17				
Accessory "Stor.,Stairs"	1,257 S.F.	300	4				
				–	–	Stair Width:	
Total Third Floor	10,871 S.F.	–	180	2	3	54"	125.5"

A.2 Existing Plans (Entire Property – Occupied and Vacant)

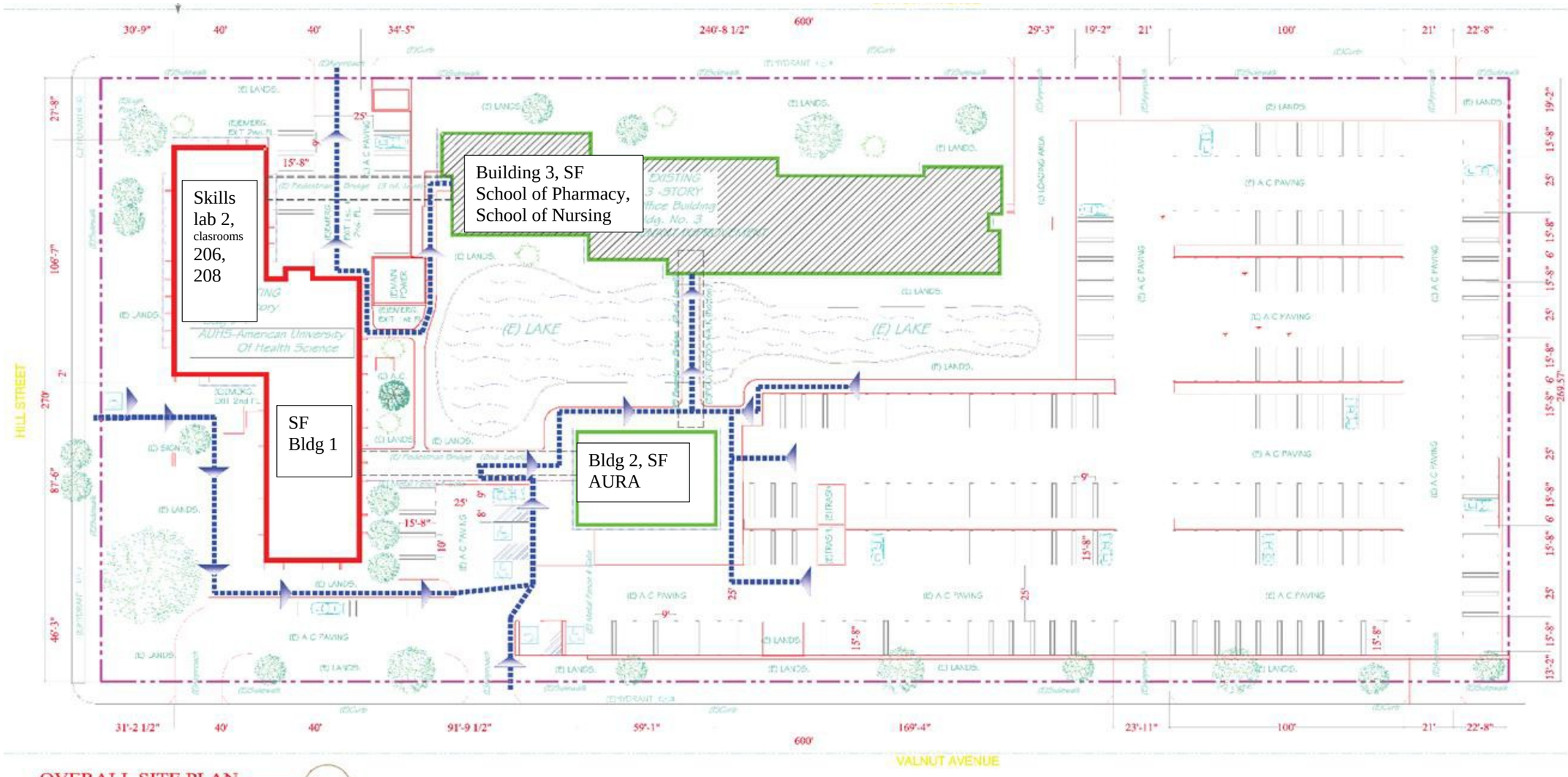
Building	Occupied	Vacant	Plans
Building 1 (28,000 sq. ft)	**Yes**	**No**	
First Floor			No plans for renovation
Second Floor			Plans for renovation: Proposed Outpatient Pediatric Clinic and Outpatient Pharmacy
Third Floor			No plans for renovation
Building 2 (10,000 sq. ft)	**No**	**Yes**	Renovation completed
First Floor			Plans to use existing classrooms
Second Floor			Plans to use existing offices and conference rooms
Building 3	**No**	**Yes**	Plans for demolition and renovations approved. Construction work 99% complete.
First Floor			
Second Floor			
Third Floor			
Parking Study	**Currently in use**	**No**	Parking and Traffic Studies completed in March 2022 (Exhibit B). Current on-site parking accommodates all programs including future operations of the Private High School, Outpatient Pediatric Clinics, and Outpatient Pharmacy Services.

PROPOSED BUILDING PLANS, ACTIVITIES, and TIMELINES

Timeline of Proposed Programs and Services: Based on completion of The City of Signal Hill's approval process.

Building # Programs/Services	Current Building Usage	Proposed Building Usage	Timeline	Target Date to Operate:
Building #3 School of Pharmacy (SOP) Doctor of Pharmacy School of Nursing (SON)	Building #3. Under renovation	Building #3. To be used for classrooms, skills lab instructions and offices for the PharmD program, and School of Nursing, and other Health Sciences courses	Fall 2022: Permits to build issued, renovations complete. Awaiting final Inspection	Target Date to operate: September 2022
Building #1 Outpatient Pediatric Clinic Outpatient Pharmacy Clinic Services	Building #1: Second Floor: Entrance from Gaviota street: Classrooms 206, and 208 used for instructions and skills lab 2	Building #1: Second Floor: Entrance from Gaviota Convert existing class rooms and computer lab to Pediatric clinic reception area and exam rooms. Existing Pharmacy lab to be converted to public pharmacy counter with pharmacy lab and classroom.	Summer/Fall 2023: Permits to build pending plan preparation June 21, 2022 – PC Workshop July 19, 2022 – PC Public Hearing August 23, 2022 – City Council Public Hearing and Approve Specific Plan September 13, 2022 – City Council 2nd Reading and Adopt Specific Plan	Start of Construction: March, 2023 Target Date to operate: September 2023
Building #2: American University Research Academy (AURA) STEAM Private High School	Building #2: Classroom use for PharmD program, and School of Nursing	Building #2: To be used for the American University Research Academy (AURA) STEAM Private High School	TBD: Pending meeting of requirements: Zoning Ordinance Amendment, parking study, required approvals from the City of Signal Hill, and other requirements.	Target Date to operate: September, 2022

OVERALL SITE PLAN: EXISTING AND PROPOSED



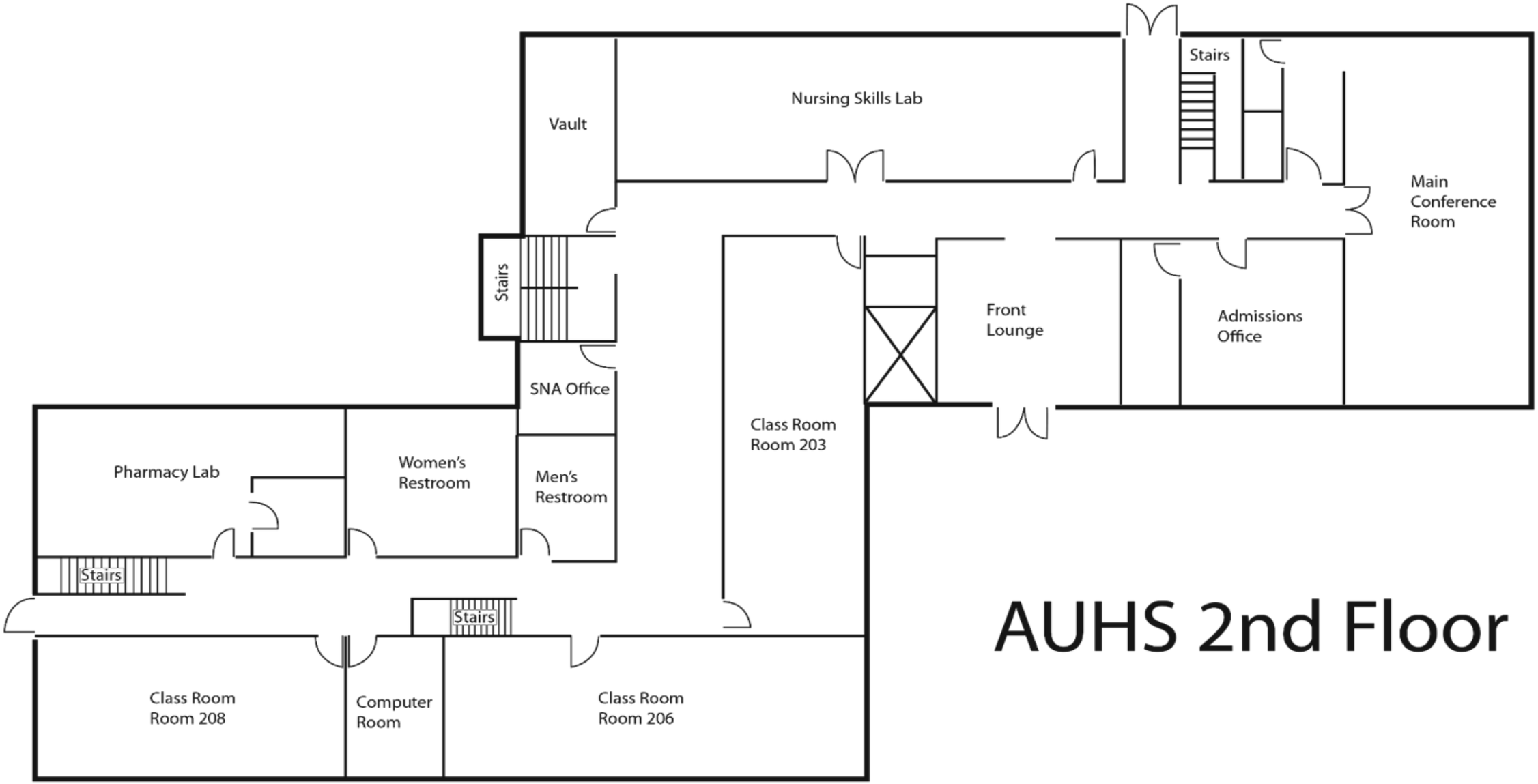
OVERALL SITE PLAN 1

BUILDING 1

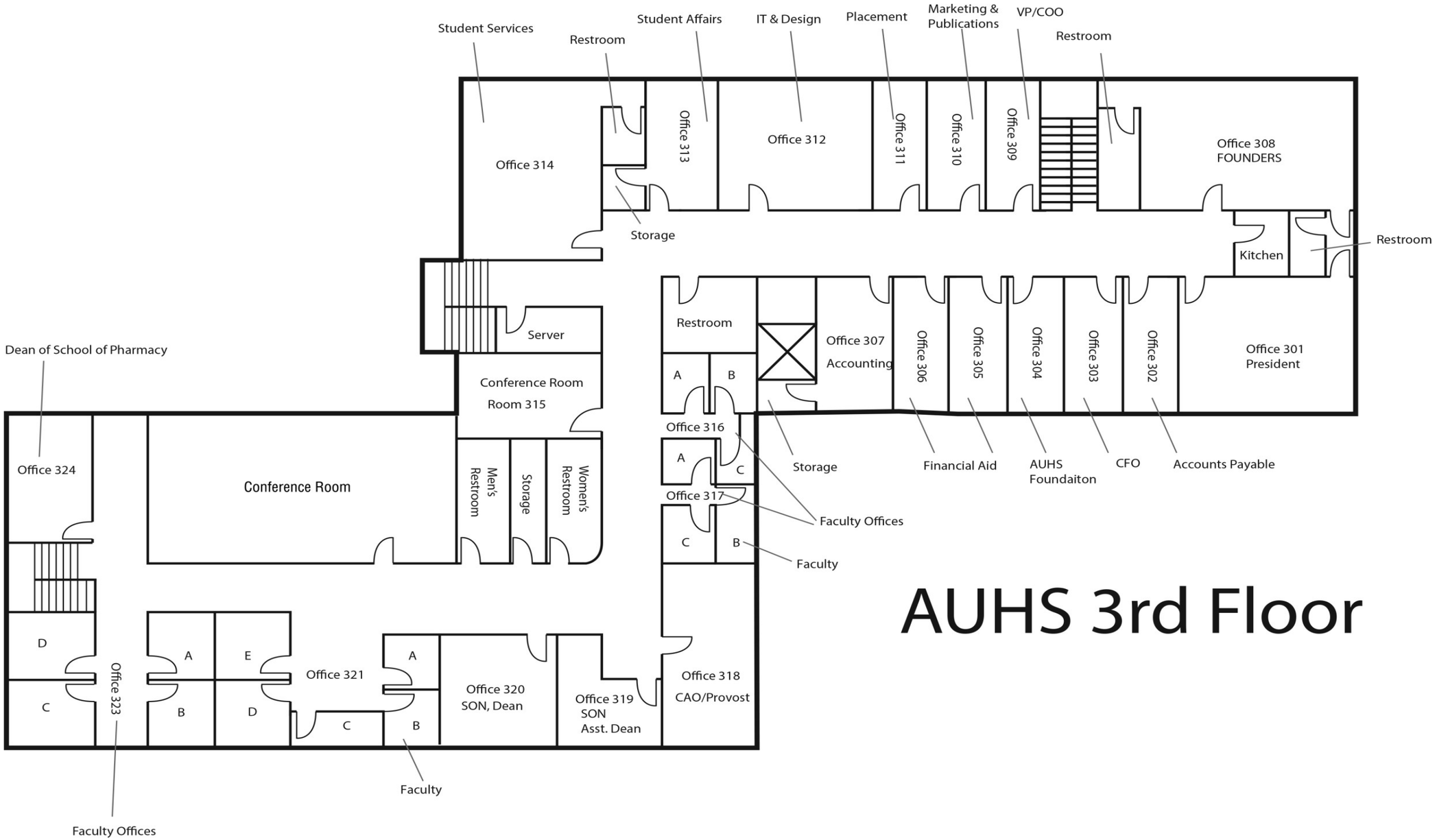
BUILDING 1: FIRST FLOOR EXISTING LAY OUT



BUILDING 1: SECOND FLOOR EXISTING



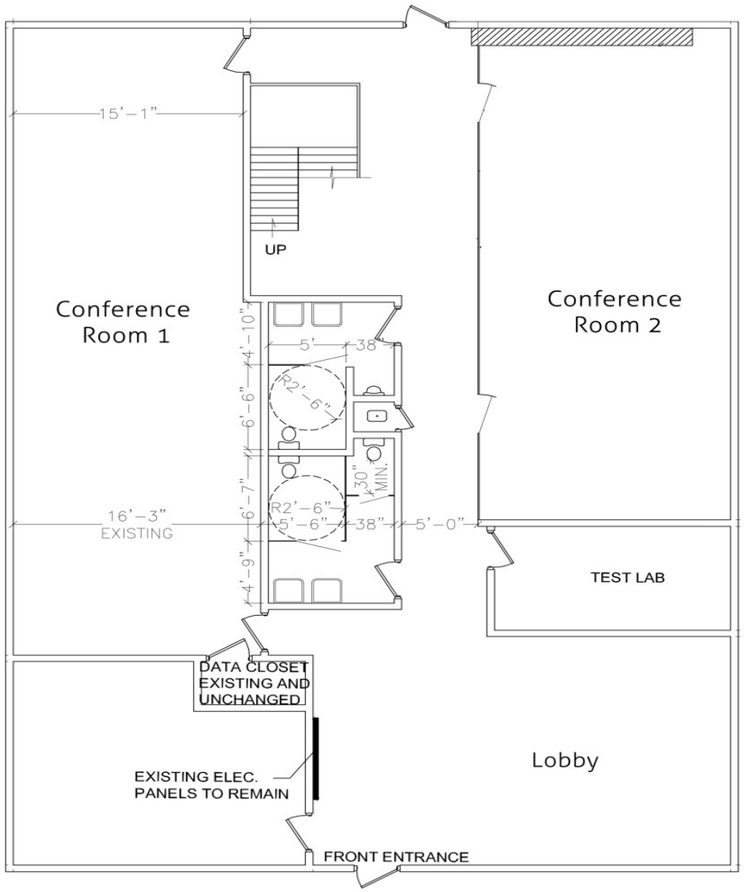
BUILDING 1: THIRD FLOOR EXISTING



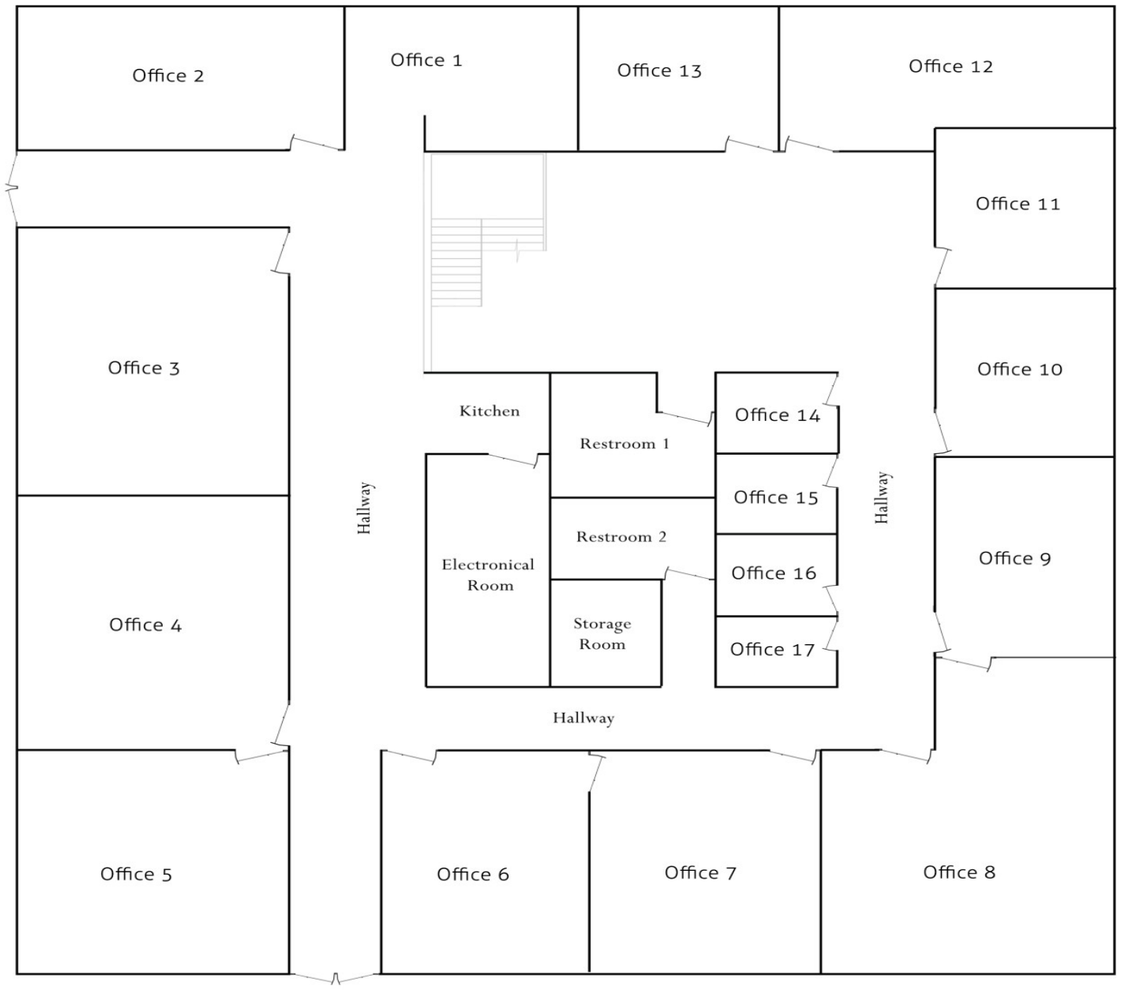
AUHS 3rd Floor

BUILDING 2 : AURA – PRIVATE HIGH SCHOOL

BUILDING 2: EXISTING LAY OUT



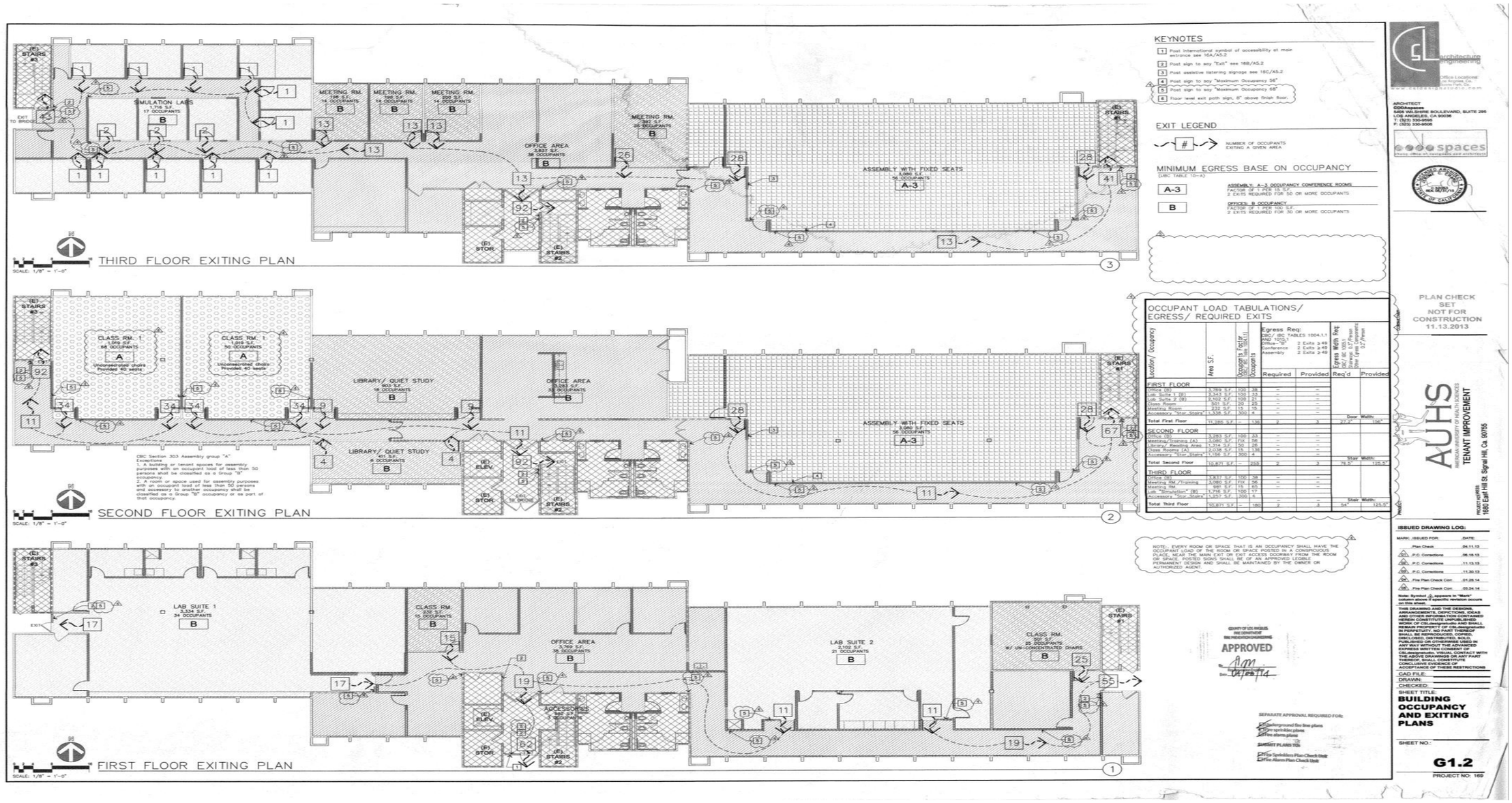
FIRST FLOOR



SECOND FLOOR

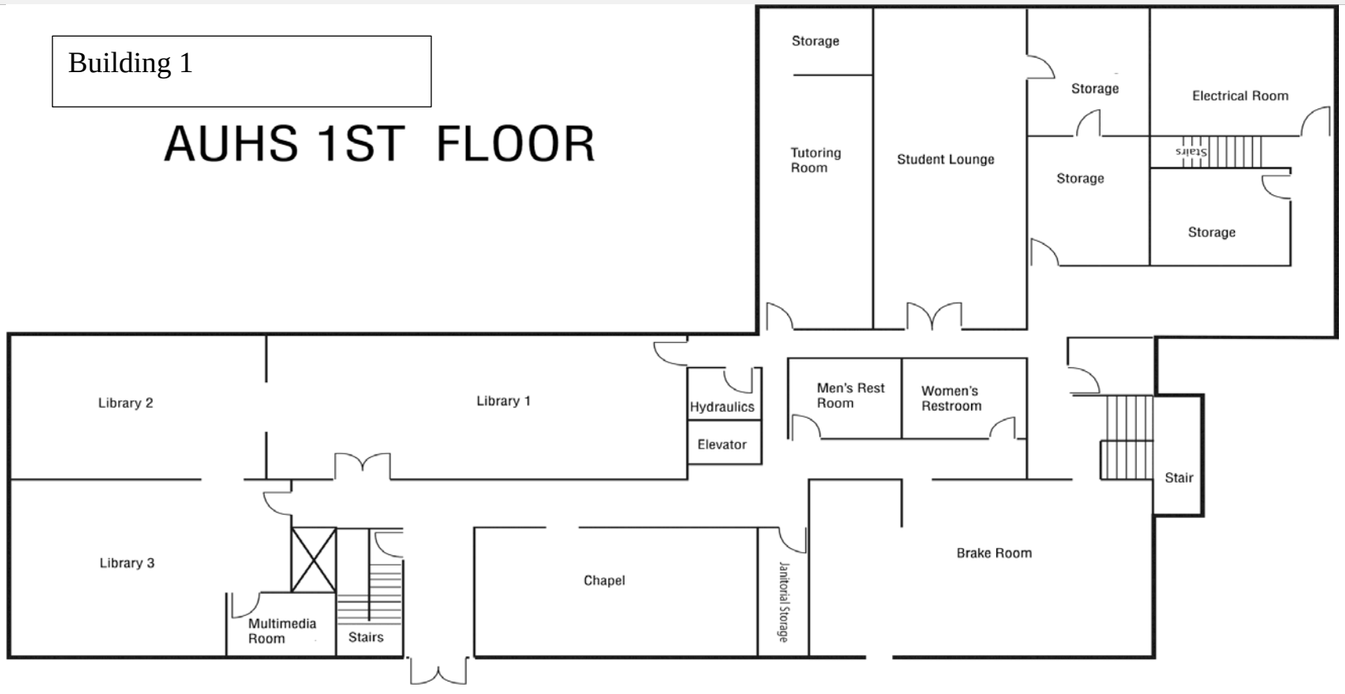
BUILDING 3: SCHOOL OF PHARMACY, and Portion of School of Nursing (Skills Lab, Classroom, office))

BUILDING 3: EXISTING LAYOUT

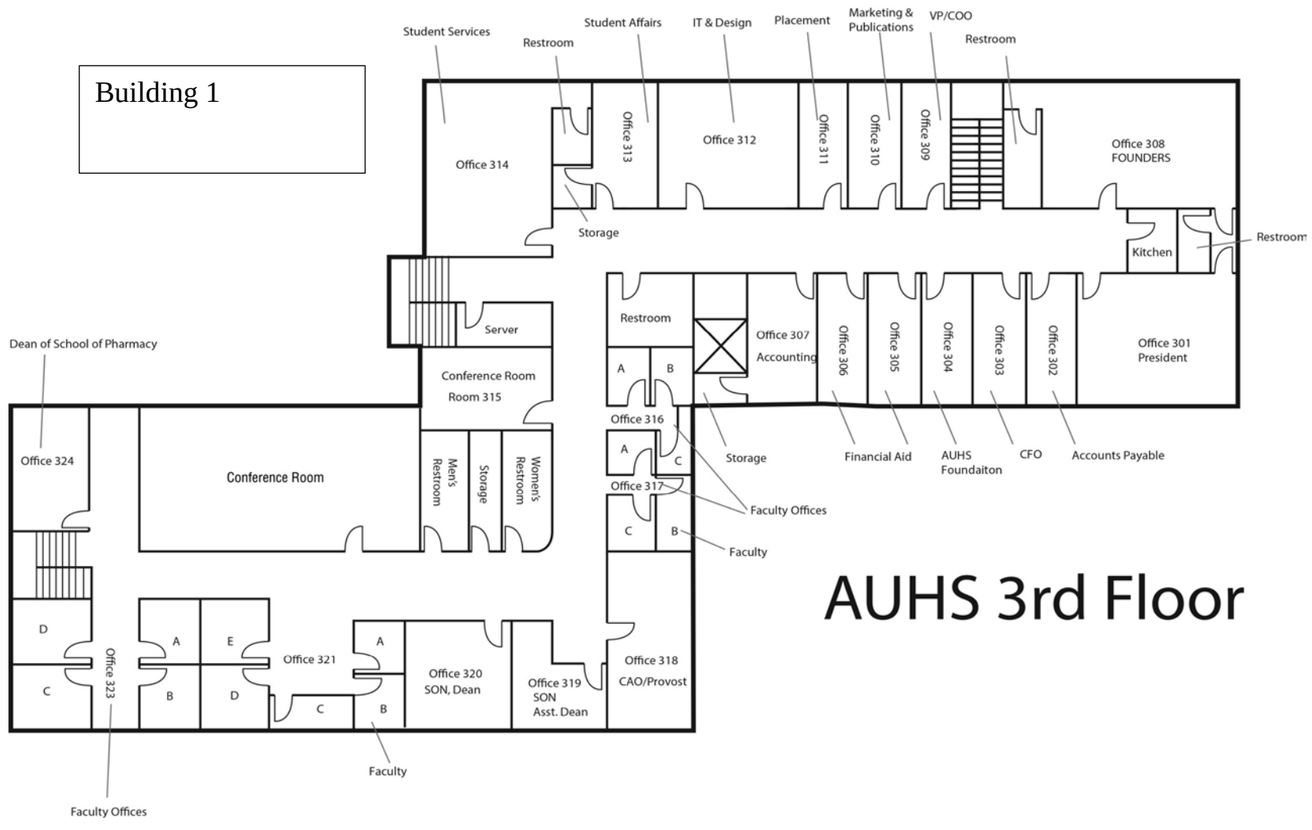


A. Phase I – SCHOOL OF NURSING Expansion of Programs Offered:

The School of Nursing Expansion of programs offered will not need build-out on physical facilities. New programs offered will include Master of Science in Nursing with specializations in Family Nursing Practice, Nursing Education, Organization and Leadership. These new programs are pending approvals from respective accrediting agencies, and proposed to start in Fall 2019.

EXISTING	PHASE 1
SCHOOL OF NURSING PROGRAM EXPANSION The expansion of programs offered will not require renovations for facilities to be utilized.	Not Applicable. No changes. New Programs offered will utilize current classrooms.. No changes in floor plan – Building 1 – 1st floor
Building 1 AUHS 1ST FLOOR 	
AUHS 2nd Floor : Existing Classroom 203 will be utilized	Plans for renovation for pediatric outpatient and pharmacy will removed 2 existing classrooms. **Please refer to plans under Outpatient Pediatric and Outpatient Pharmacy – Phase 2**

(cont'd) Phase I – SCHOOL OF NURSING Expansion of Programs Offered:

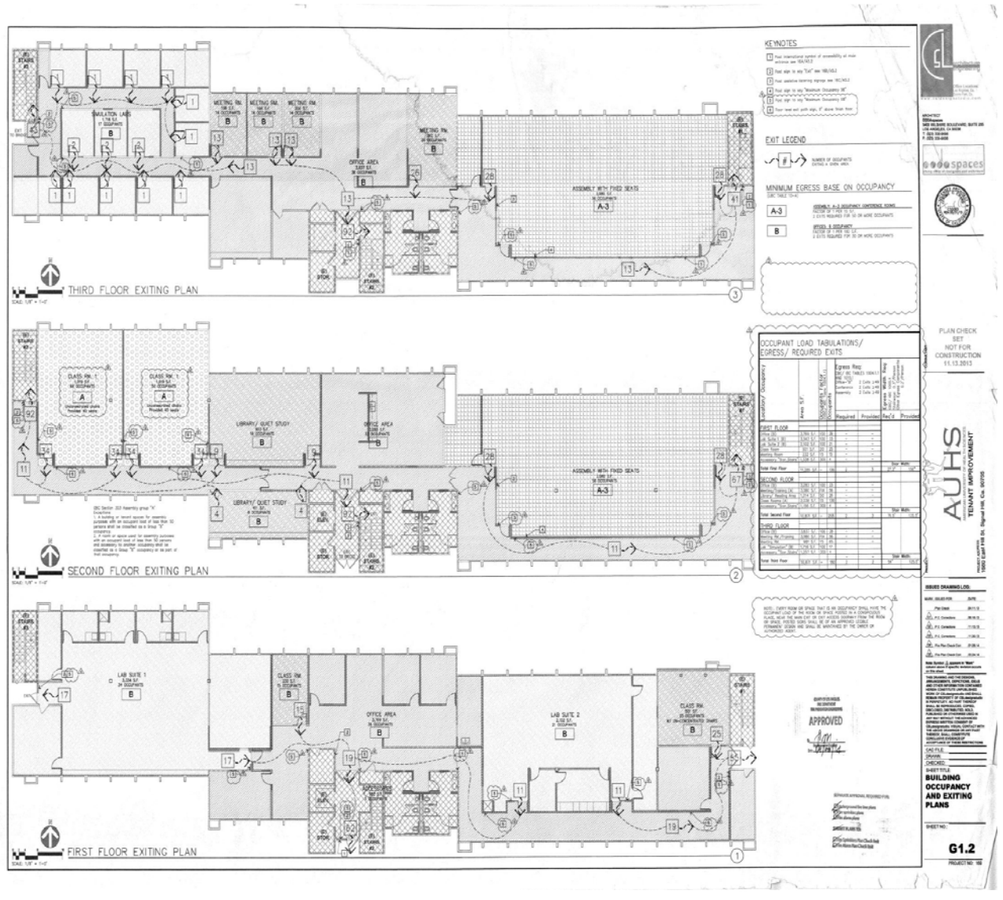
EXISTING	PHASE 1
	Not Applicable. No changes. New Programs offered will utilize current classrooms. No Changes to Floor Plan,

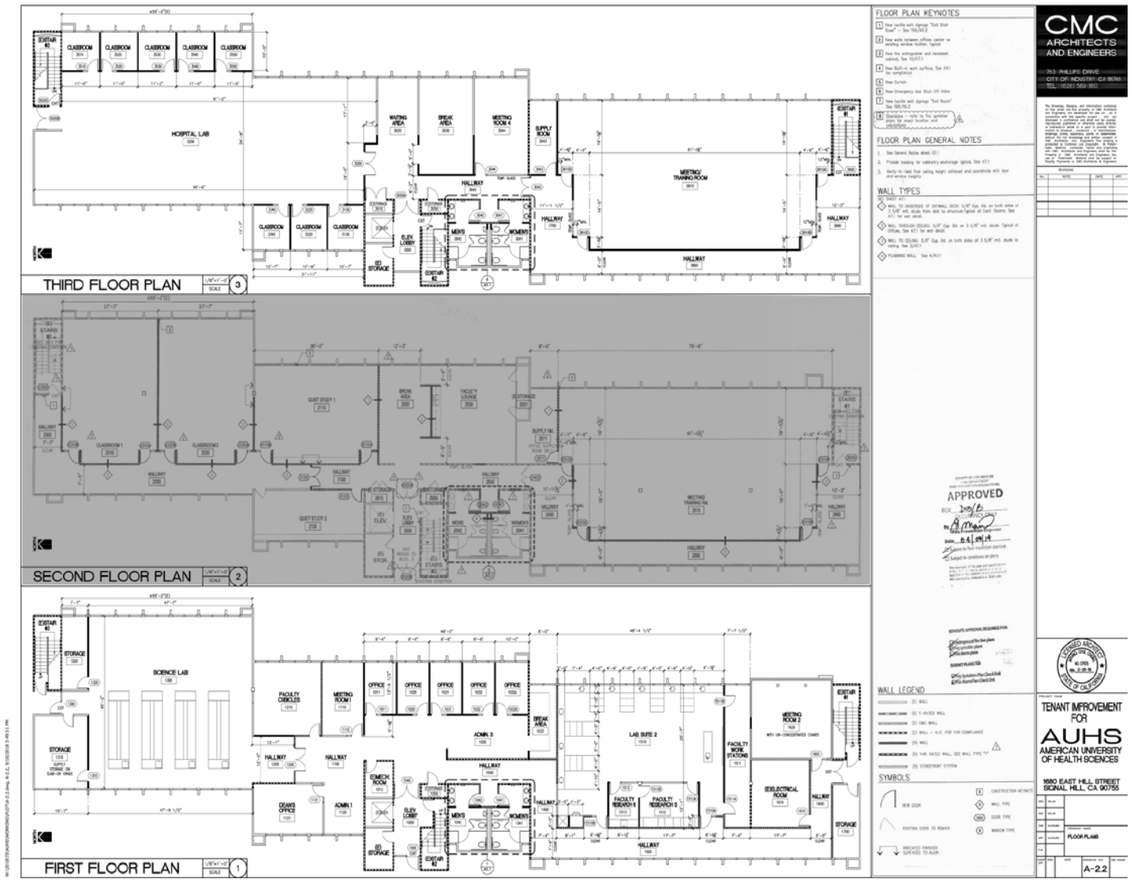
B. Phase II – Doctor of Pharmacy Program (PharmD) – School of Pharmacy:

The proposed Doctor of Pharmacy Program will occupy building 3, all of 2nd floor, Renovations are complete and awaiting final inspections. This building will house classrooms, skills lab, auditorium, offices, and clinical laboratory. Projected start of the first cohort is proposed for Fall 2022. First Floor will house Science Laboratory and Laboratory Suites, and faculty/administrative offices.

BUILDING 3: PROPOSED LAYOUT

EXISTING **PHASE 1**

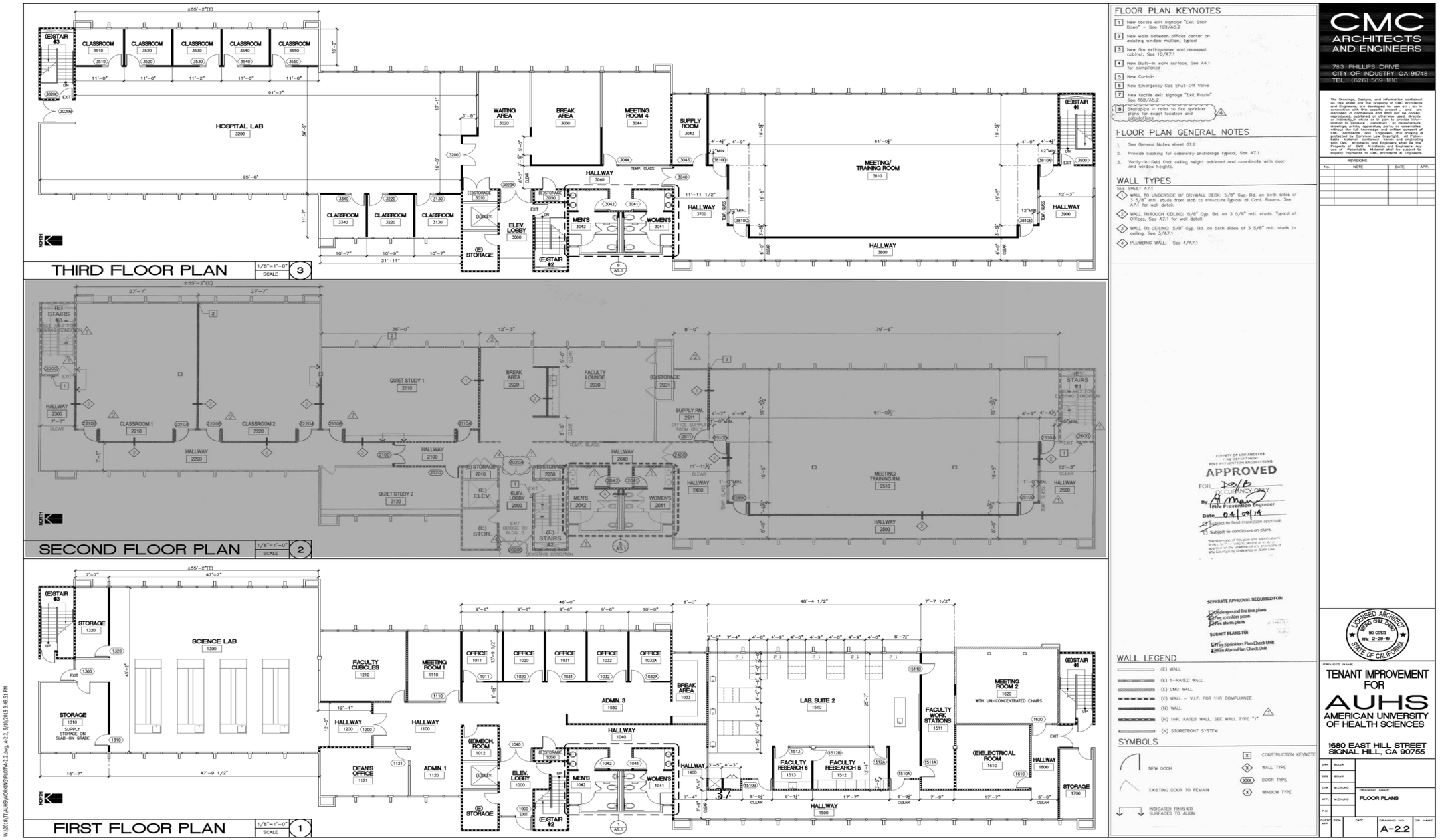




Building 3: Proposed Plan

C. Phase III - Outpatient Pediatric and Pharmacy Clinic: Building 1, Floor 2, North East Corner

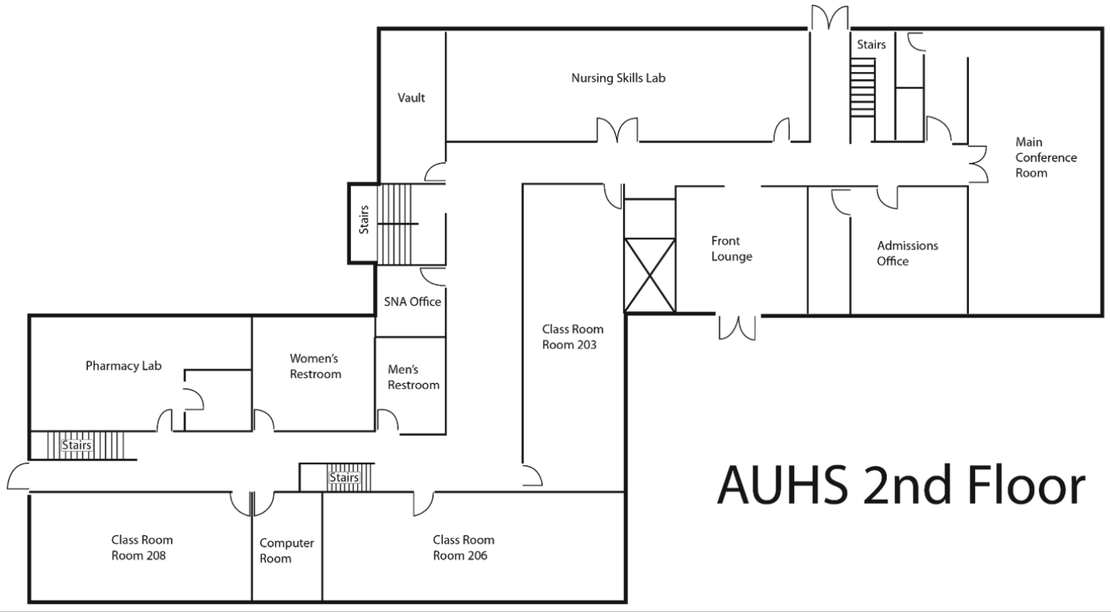
As part of its ongoing efforts to improve patient's access to health care and related services, American University of Health Sciences (AUHS) is subsidizing the start-up and first year of operations of a new

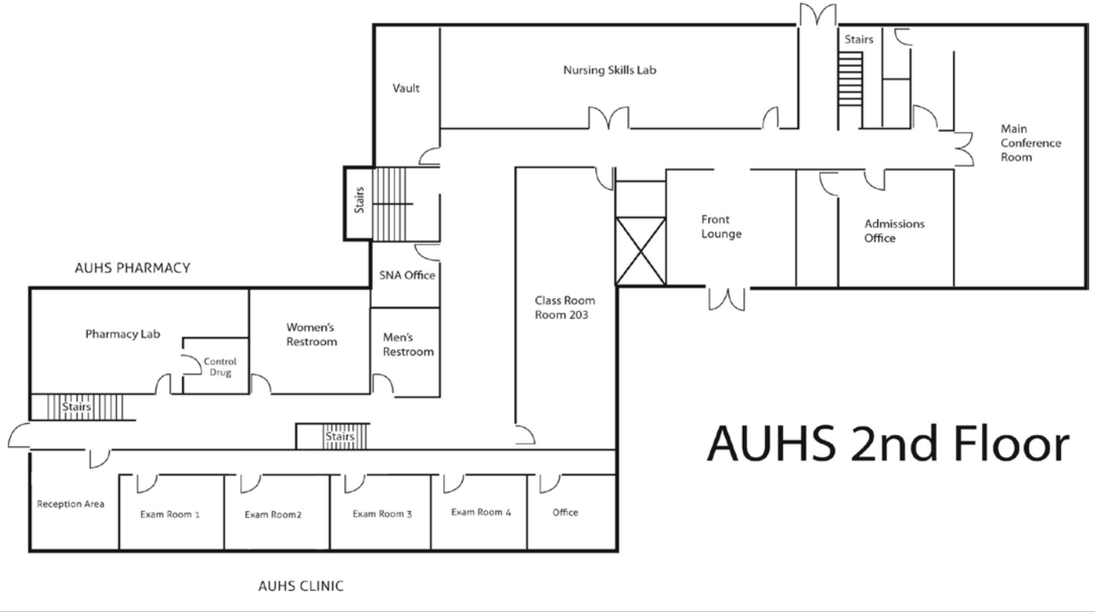


33,027 Square feet.

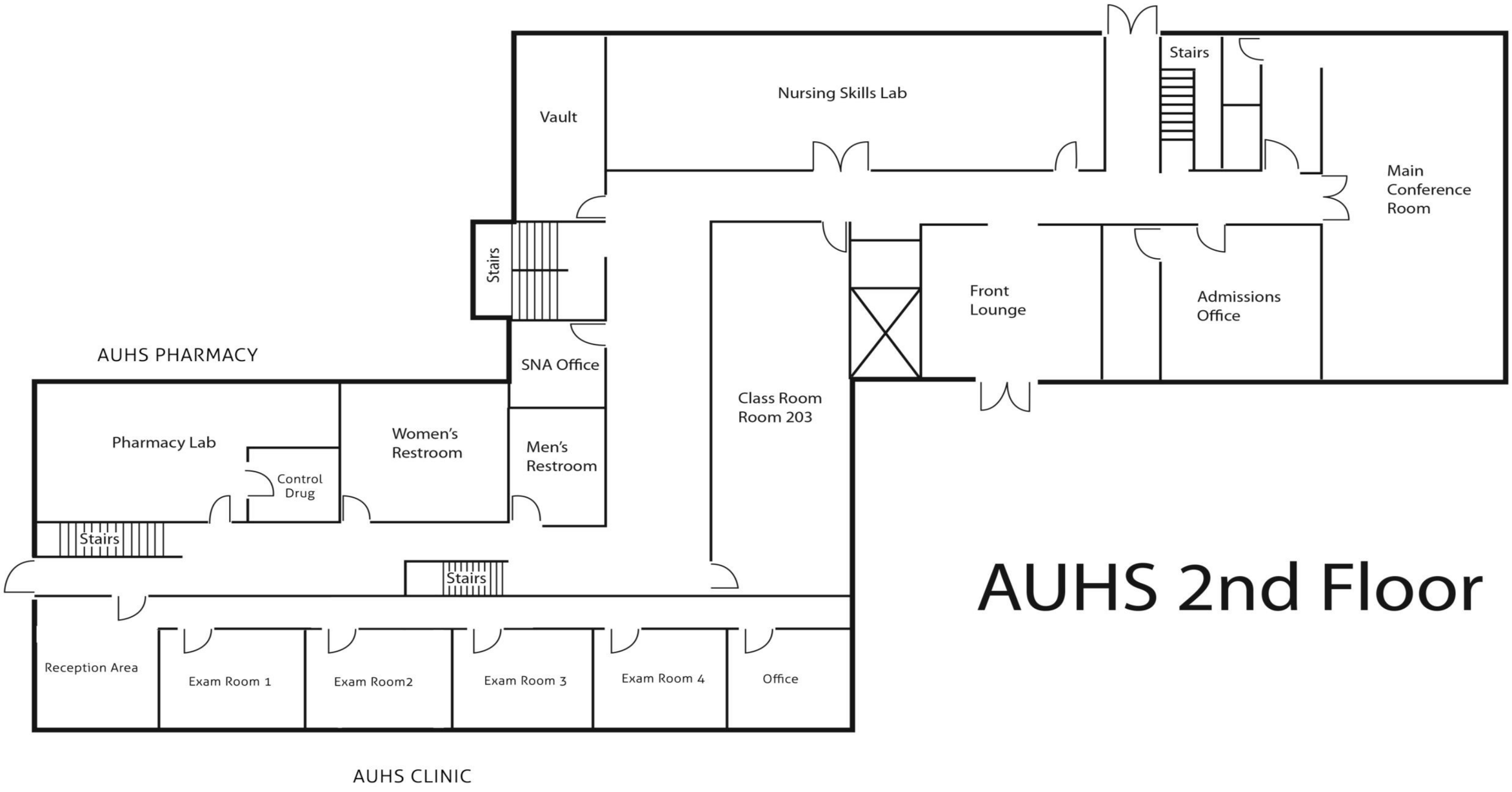
AUHS ***Outpatient Pediatric Clinic & Pharmacy Services*** to be housed at the University Campus in Signal Hill, in Building 1, Second floor. Existing Pharmacy lab and classroom to be converted to a functioning public pharmacy with attached lab and classroom. Classrooms 208 and 206, and computer room to be converted to Pediatric Clinic reception area and examination rooms.

EXISTING	PHASE II
Building 1: Existing Second Floor	**Building 1: Proposed Plans for Second Floor**





Building 1: Proposed Plans for Second Floor: Housing the AUHS Pharmacy Clinic



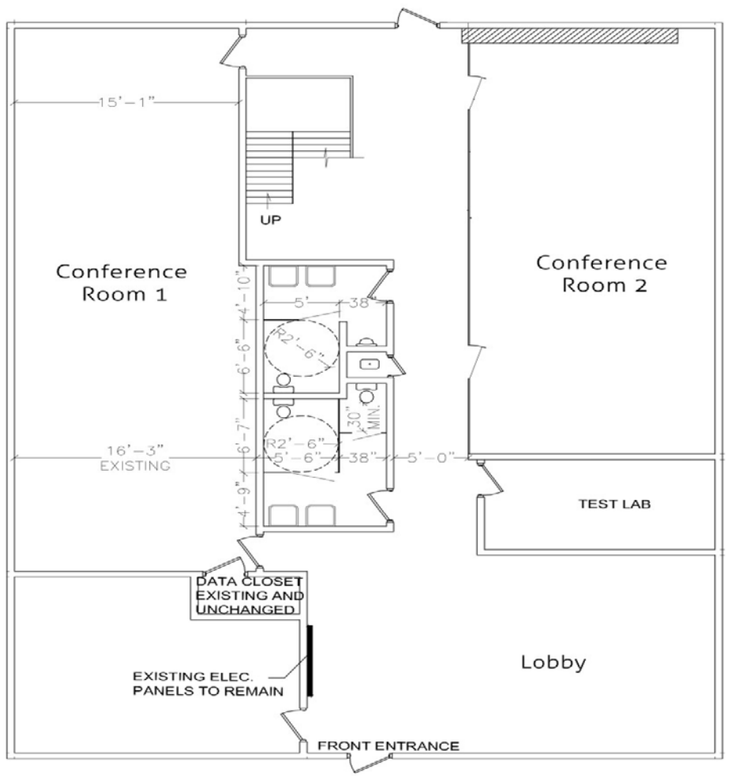
AUHS 2nd Floor

D. Phase IV - American University Research Academy (AURA) STEAM Charter High School

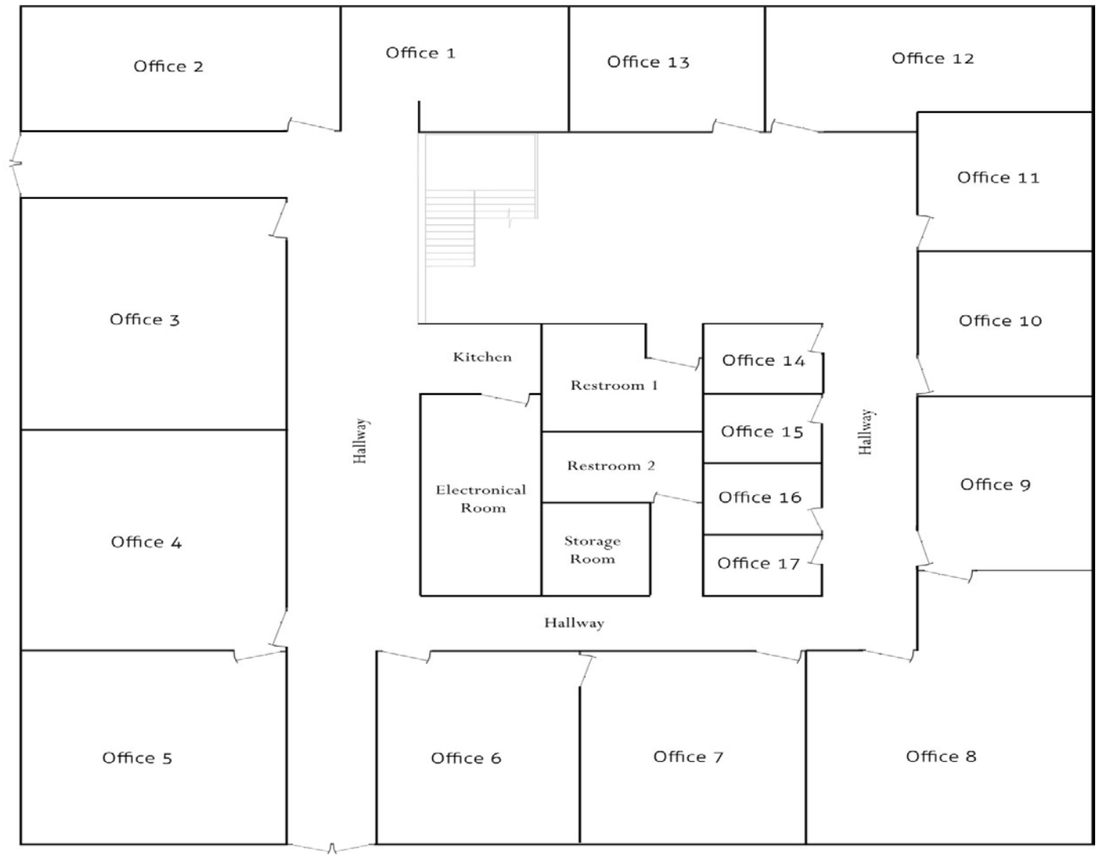
American University Research Academy (AURA) Private High School will be an institution of learning where students of diverse background will be taught by a faculty whose real world and academic training will guide them on the road to rewarding careers in the medical sciences. Curriculum will be developed with the guidance of the California Private Schools Association (CCSA) and STEAM. STEAM Education is an approach to learning that uses Science, Technology, Engineering, the Arts and Mathematics as access points for guiding student inquiry, dialogue, and critical thinking.

The proposed location for the *AURA STEAM Charter High School* is Building 2 at the AUHS campus. The construction of this building has been completed providing the following areas for student, faculty/staff, and administrative use: 1st Floor - 2 classrooms, and 2nd floor – Offices and conference rooms.

BUILDING 2: EXISTING LAY OUT AND NO PLANS FOR BUILDING CHANGES



FIRST FLOOR



SECOND FLOOR

Section IV: Community Events

Community Outreach Programs Impact on the Surrounding Area

American University of Health Sciences Foundation is one of the most significant assets to communities it serves. Committed to the mission of AUHS Foundation, American University of Health Sciences plays a vital role by offering invaluable educational programs to underserved population and second-chance opportunities to students who face barriers to succeeding in their educational goals. As part of the proposed programs and projects, AUHS outpatient pediatric clinic and outpatient pharmacy will provide care resources to benefit patients in the surrounding neighborhood, and the City of Signal Hill. Prime to the needs of this community is access to private high school to which AUHS is responding through establishing a Charter High School within the University Campus. Benefits of the Community Outreach programs and Community Events through the AUHS Foundation, and the Charter High School are as follows:

A. Community Outreach

The AUHS Foundation responds to local, community, and global needs of homelessness, poverty, and diversity in health care through the following solutions:

- ***Homeless Outreach***

  American University of Health Sciences Foundation funds programs that meet the immediate needs of the homeless community and outreach programs to affect long-term gains and to mitigate the causes of homelessness.

- ***Serving Families In Need***

  American University of Health Sciences Foundation developed programs that impact the lives of the underserved community by providing fresh groceries through quarterly **Acts of Love**, bringing joy to disadvantaged children during the holidays with the **Santa Cause Toy Drive**, and improving health care delivery by bringing providers into underserved communities with our **Annual Health Fairs**.

- ***Closing the Gap***

  American University of Health Sciences Foundation has created opportunities and mentorship to empower inner-city and at-risk youths to succeed in school today and for the future. Be an inspiration to underprivileged kids and make a difference with your donation.

- ***Youth Enrichment in Science (Y.E.S.)***

  American University of Health Sciences Foundation's Youth Enrichment for Sciences (Y.E.S.) programs address the issue of diversity in health care and education for underrepresented and underserved populations by exposing children to health care professions on three levels: ***Y.E.S. programs at Elementary, Middle and High School***. These educational programs empower minority and underprivileged youths to dream bigger futures for themselves, their families and communities.

- ***Reading Readiness Mentorship***

  Research has shown that reading is a major predictor of academic success. To prepare students for success in school and their future, AUHS Foundation has partnered with local elementary schools in the cities of Long Beach and Signal Hill to provide reading help to at-risk youths. Through personalized one-on-one attention, inner-city youths are given a chance to improve their literacy skills. Student volunteers from American University of Health Sciences are paired up with at risk students identified by our partner elementary school

counselors. These partnerships require a minimum of 6 months commitment during the school calendar year to allow time for trust and synergies to develop between students and mentors.

- ***Aspire 2 Inspire (A2i) Summer Camp***

  Aspire to Inspire (A2i) Mentorship Summer Medical Camp is a four-day camp for high school students who are interested in careers in patient care, medicine, pharmacy and/or other health-related fields. Students will have the unique opportunity to explore the exciting world of health sciences as these camps are led by A2i mentors who are attending the American University of Health Sciences (AUHS) nursing program with patient care background as LVN, psych techs or surgical tech. Hands-on activities focused on patient care, EMT, first-aid, CPR, and Pharmacy Technology are under the supervision of AUHS professors and A2i mentors.

- ***Backing Our Future-Backpack Campaign***

  This year 2018, American University of Health Sciences Foundation is launching the "Backing our Future" Backpacking Campaign to distribute backpacks filled with grade-specific school supplies to low-income and homeless students enrolled in Title 1 "inner-city" schools in the Long Beach area. Many students enrolled in these local schools receive free or reduced lunches and are at a disadvantage already based area schools and community services organizations on other projects and will work with them to identify students in need. Our goal is to give disadvantaged youths the tools they need to succeed at learning.

- ***Annual Book Fair***

  Approximately 700+ books were distributed at the inaugural AUHS Foundation Book Fair on Saturday, October 28th, 2017. It was held in conjunction with the 5th Annual Health and Wellness Fair as an introduction to what will become an annual community event. The event attracted children from ages 4-12 and their families.

They browsed the stacks of books for potential reading material to take home. The AUHS Librarian and student volunteers spent the duration of the event inquiring about reading preferences and offering book suggestions. A variety of books were available to take home, from classics by Dr. Seuss to the famous Diary of a Wimpy Kid series. All quickly found new homes in the hands of eager children. Also, children were invited to an activities table to complete puzzles and coloring activities as they waited for entry into the health fair.

B. Community Events

American University of Health Sciences faculty, staff and students participate in and supports the AUHS Foundation community events. As one of the requirements for graduation, AUHS students participate in these community events to complete 100 hours of community services. As described previously in this section, the following lists the community events scheduled throughout the year:

A. *Homeless Outreach* Events:

- Lamp Unto My Feet
- Giving Thanks
- Pray It forward
- Wish/Mash

B. *Serving Families in Need* Events:

- Acts of Love
- Santa Cause
- Annual Health Fair

C. *Closing the Gap* Events:

- Youth Enrichment in Science (YES)
- Aspire to Inspire (A2i)
- Reading Readiness Mentorship
- Backing Our Future (Backpack Campaign)
- Annual Book Fair

Section V: Parking Management Plan

1. **Phase I, II & III– Steps taken to minimize overflow parking**

The open parking lot of American University of Health Sciences is accessible from different street areas: Gaviota and Walnut streets. Open surface parking lot from the Walnut entrance is currently used as parking area and service drive to unloading/loading and trash disposal functions area. The existing open parking area accommodates approximately 250 vehicles. As part of this expansion AUHS hired the transportation engineering firm of Linscott, Law & Greenspan to conduct an extensive review of the schools parking capacity and to evaluate the impact on local traffic that these three expansions may cause. Working in association with the City of Signal Hill's Traffic Consultant we will make sure that our parking lot can be managed to accommodate these expansions as well having negligible impact upon the traffic surrounding the university.

Section VI: Implementation

1. Administrative Review: Phase I & II (Nursing & Pharmacy School with Outpatient Pharmacy and Clinic, eligible for staff review process

2. Planning Commission & City Council Review: Phase III (2 outpatient clinic and Pharmacy) and beyond required discretionary review of Zoning Ordinance Amendment and Parking Management Plan. Phase IV – AURA – Charter HS, Phase V – School of Medicine

3. Amendments:

This Implementation Plan identifies Strategic Plan priorities for the next two (2) years and outlines how these will be achieved. With this in mind, this plan will require the review of the City of Signal Hill staff, Planning Commission & City Council review. AUHS focuses its efforts in key areas of the phase's implementation reflecting goals, outcomes and timelines.

ACTION	RESPONSIBILITY		TIMEFRAME		Goals/Outcomes
	Lead	***Contributors***	***2018 - 2019***	***2020 - 2023***	
Re-submission of Master Plan to the City of Signal Hill	Dr. Uvero (AUHS)	Dr. Carol Ryan Ivy Javaluyas (AUHS)	Fall 2018	Winter 2020	• Administrative Review by the staff of the City of Signal Hill. • Seeking Approval of the Master Plan
Nursing School Expansion of Programs Offered	AUHS Academic and Operations Divisions		Fall 2018-2019	Winter 2020 Start	• Seeking approval from accrediting agencies. • Facility renovation is not required. The expansion of the programs offered will utilize current classrooms and office.
Outpatient Pharmacy Clinic and Pediatric Clinic	AUHS Academic and Operations Divisions		Fall 2019	Winter – Fall 2020	• Seeking approval from accrediting agencies. • Converting classrooms to pharmacy and pediatric clinics.

ACTION	RESPONSIBILITY		TIMEFRAME		Goals/Outcomes
	Lead	***Contributors***	***2018***	***2023***	
Doctor of Pharmacy Program	AUHS Academic and Operations Divisions		Fall 2023	Spring 2023	• Approval received from accrediting agencies. • ***Onsite visit complete*** • ***ACPE pre-accreditation approved*** • Building 3 renovation 99% complete. Awaiting final inspections by LA County Fire and the City of Signal Hill • ***Seeking Approval from the City of Signal Hill for the Strategic Master Plan – AUHS growth plan***
AURA and STEAM Charter High School	AUHS Academic and Operations Divisions		Winter-Fall 2022	Spring 2023	• Approval received from accrediting agencies. • ***Seeking Approval from the City of Signal Hill for the Strategic Master Plan – AUHS growth plan*** • Building 2 renovation completed

ACTION	RESPONSIBILITY		TIMEFRAME		Goals/Outcomes
	Lead	***Contributors***	***2018 -***	***2023***	
Parking Management Plan	Morgan Pickard of MPAD, Trissa de Jesus Allen of LLG Engineering	AUHS Operations Division: Dr. Uvero, Dr. Ryan, Ivy Javaluyas	Fall 2018 – Winter 2019		• Seeking approval from City of Signal Hill • *Phase I-II: Finalize steps to minimize overflow parking, Awaiting review and approval by the City of Signal Hill staff.* • *Phase III & Beyond:* Completed Traffic and parking studies awaiting review and approval by the City of Signal Hill Engineer as basis for a Parking Management Plan.
City of Signal Hill Administrative Review	City of Signal Hill Staff	AUHS Academic and Operations	Fall 2022	*Spring 2023*	• Phase I-II: Finalized steps to minimize overflow parking at AUHS campus, *Awaiting review and approval by the City of Signal Hill staff.*

ACTION	RESPONSIBILITY		TIMEFRAME		Goals/Outcomes
	Lead	***Contributors***	***2018 -***	***2023***	
City of Signal Hill Planning Commission & City Council Review	City of Signal Hill Staff	AUHS Academic and Operations	Fall 2022	Spring 2023	• *Phase III and beyond*: Require discretionary review of Zoning Ordinance Amendment and Parking Management Plan for AUHS Campus. • AUHS seeks approval of Phase Phase III to be developed by LLG Engineering Group, Inc. working directly with the City of Signal Hill • AUHS awaiting approval of the Parking Management Plan.
New Initiatives: School of Medicine: Doctor of Medicine	AUHS Academic and Operations Divisions			***2023-2024***	• *Explore and envision the School of Medicine development* • *Funding* • *Accreditation requirements* • *Physical facilities and resources* • *Feasibility Study* • *Develop task force* • *Engage Community* • *Consult with the City of Signal Hill* • *Explore partnerships* • *Marketing and recruitment plans*

Summary and Conclusion

Charting a five-year Implementation Plan is a strategic, comprehensive and ambitious objectives. Implementation plans should consider the alignment of its functions and operations to structures and infrastructures. AUHS considers the alignment of its functions and operations (such as the annual budget process, monitoring of implementation plan progress) as well as the completion and alignment of many other key plans to completion of these actions, activities and plans.

Considering the short-term implementation of the SON expanded programs, outpatient pediatric and pharmacy clinic, and PharmD program over the next two years inspires AUHS to thread into new initiatives and investing time and efforts while monitoring and balancing the five-year implementation timeline. The initiatives and investment projects that have already been approved such as the SON expanded program and PharmD programs, received funding and are currently in progress comprise the first two years of implementation. Exploration of new initiatives and community engagement will drive the phase two-three strategic development plan.

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June 27, 2022

Dr. Marilyn Uvero
COO/VP of Operations and Development
American University of Health Sciences (AUHS)
1600 E. Hill Street
Signal Hill, California 90755

LLG Reference: 2.20.4324.1

Subject: ***Revised*** **Focused Traffic Impact Assessment for the Proposed American University of Health Sciences (AUHS) Master Plan**
Signal Hill, California

Dear Ms. Uvero:

Linscott, Law & Greenspan, Engineers (LLG) is pleased to present the findings of this Revised Focused Traffic Impact Assessment for the American University of Health Sciences (AUHS) Master Plan ("Project") in the City of Signal Hill (revision to the May 23, 2021 Focused Traffic Impact Assessment).

AUHS is located at 1600 East Hill Street and is situated in a mixed industrial-residential area. The university campus sits on a rectangular-shaped, six-acre parcel of land that is located south of East Hill Street, between Walnut Avenue and Gaviota Avenue. AUHS has three separate buildings totaling 72,000 square feet (SF), with 237 surface parking spaces on site. The University has only one main campus and no branch locations. There is one remote learning site, Valley High School, where AUHS leases for science laboratory practice in Chemistry and Microbiology.

Pursuant to the City of Signal Hill's requirements, a focused traffic impact assessment is required to address the potential traffic impacts and circulation needs associated with the Project. As part of their Master Plan, AUHS proposes to offer new programs to supplement the programs of study now offered: Bachelor of Science in Nursing (SON-BSN) and Doctorate of Science in Pharmaceutical Sciences (SOP). The proposed new programs are the Master of Science in Nursing and Doctor of Nursing Practice within the School of Nursing (SON-MSN), American University Research Academy Private High School (AURA), AUHS School of Medicine (SOM), and The Outpatient Pediatrics Clinic and Pharmacy. It is anticipated that the current enrollment of 180 students would be increased to 470 students in the future, of which 231 students would be the maximum on-site attendance (239 students would be off campus enrolled in off-site instruction and online programs).

Philip M. Linscott, PE (1924-2000)
Jack M. Greenspan, PE (Ret.)
William A. Law, PE (Ret.)
Paul W. Wilkinson, PE
John P. Keating, PE
David S. Shender, PE
John A. Boarman, PE
Clare M. Look-Jaeger, PE
Richard E. Barretto, PE
Keil D. Maberry, PE

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The Focused Traffic Impact Assessment for the proposed Project will satisfy the traffic impact requirements of the City of Signal Hill and will focus to the following three (3) key study intersections:

1. Walnut Avenue at Hill Street (City of Signal Hill)
2. Cherry Avenue at Hill Street (City of Signal Hill)
3. Walnut Avenue at E. 20th St/Alamitos Ave (Cities of Signal Hill/Long Beach)

Included in this traffic assessment are:

1) Existing traffic counts,
2) Estimated Project traffic generation/distribution/assignment,
3) AM and PM peak hour analyses for existing traffic conditions,
4) AM and PM peak hour analyses for existing plus project traffic conditions,
5) AM and PM peak hour analyses for Year 2040 buildout without and with project traffic conditions
6) Intersection Vehicle Queueing Analyses, and
7) Vehicle Miles Traveled (VMT) Assessment.

PROJECT DESCRIPTION

Figure 1 presents the vicinity map. ***Figure 2*** presents an aerial image of the existing site. ***Figure 3*** illustrates the site plan. In addition to the programs listed above, the University plans to offer these additional programs and community services:

A. School of Nursing (SON-MSN)
Offering the addition of Master of Science in Nursing and Doctor of Nursing Practice programs (SON-MSN) within the School of Nursing,

B. The School of Medicine (SOM)
The AUHS School of Medicine will offer Doctorate degree education to students of diverse background.

C. American University Research Academy (AURA) Private High School
The Private High School (AURA) will be an institution of learning where students of diverse background will be taught by a diverse faculty equipped with mastery in delivering quality instructions based on required curriculum.

So as not to add to the peak commute morning and afternoon traffic congestion, AURA's starting and ending bells will not coincide with the Signal Hill Elementary School also near the intersection of E. Hill and Walnut Avenue, and the typical PM peak hour from 5:00 PM to 6:00 PM. In addition, students who

attend the High School will only be allowed a total of 20 parking permits. Permit preference will go first to seniors and then by birth date if additional spots are available. Based on this, student vehicle trips generated by AURA, including drop-off and pick-up trips, would therefore not occur during the typical AM and PM peak commute periods analyzed in this traffic study.

D. Outpatient Pediatrics Clinic and Pharmacy

American University of Health Sciences Outpatient Pediatrics Clinic will provide an interdisciplinary delivery of pediatric patient care, support the School of Nursing and School of Pharmacy students in their pediatric clinical rotation at a university-based services. An AUHS Care Model will be launched to provide care to the under-served pediatric patient population from the communities that it serves. The Pharmacy will provide services that utilize the knowledge and skills of pharmaceuticals, and drugs systems (within accepted professional standards and ethics) in support the School of Pharmacy students and as a service to the City of Signal Hill.

AUHS anticipates that the current enrollment of 180 students would be increased to 470 students in the future (inclusive of 5 minor patients for the clinic), corresponding to a net addition of 290 students. In consideration of the Project's anticipated operational characteristics that would include future off-campus clinical/lab studies and internships, independent study programs, and online instruction, it was necessary to estimate the maximum number of students and employees that would be on campus. AUHS provided information with regards to total student enrollment versus on-site student and staff/faculty attendance under existing/current conditions and in the future. AUHS indicated that, of the anticipated enrollment of 470 students (including 5 minor patients for the clinic), only 231 students are expected to be on campus (because 239 students will be enrolled in off campus instruction and online programs). The 231-student on-campus attendance was used as basis for estimating the Project's trip generation potential in this traffic study.

SITE ACCESS

Vehicular access to the project site is currently provided via four (4) full-access driveways (i.e. Project Driveway No. 1, No. 2, No. 3, and No. 4) located along Walnut Avenue.

As illustrated with green arrows on *Figure 3*, access will be adjusted with completion of the Project. Project Driveway No. 1 is proposed to provide right-turn out only access (i.e. no ingress), Project Driveway No. 2 is proposed to provide full ingress access only (i.e. no egress), Project Driveway No. 3 is proposed to provide full egress

access only (i.e. no ingress), and Project Driveway No. 4 is proposed to provide no access (i.e. permanently gated off; opened for emergency access only).

The driveways located along Gaviota Avenue are closed and will not provide access to the Project. Also illustrated on *Figure 3* is the pickup/drop off staging area, served by the two most northern Project driveways. All pickup/drop off activity will be accommodated on site (no pickup/drop off activity will occur off-site on public streets). The driveway configurations at all four (4) Project driveways along Walnut Avenue, as well as the internal circulation design aspects of the site which is illustrated on *Figure 3* in blue arrows, would adequately serve all inbound/outbound and pickup/drop off activity on site which in turn would not impact other existing and future development adjoining the AUHS site.

EXISTING CONDITIONS

Existing Roadway Conditions

Figure 4 presents an inventory of the existing roadway conditions for the three (3) key study intersections. This figure identifies the number of travel lanes and controls for the key study intersection.

Existing (Year 2021) Traffic Volumes

Per City of Signal Hill direction, existing traffic volumes for the three (3) key study intersections are derived from the Opening Year (Year 2020) With Project Peak Hour Turning Movement Volumes (*Figures 33 & 34*) from the *Signal Hill Business Center Traffic Impact Analysis* (prepared by Kunzman Associates in July 2019). These Year 2020 AM and PM peak hour traffic volumes have been grown at the city-approved growth rate of one percent (1%) per year to establish Year 2021 existing traffic volumes (i.e. 1% total growth).

Figures 5A and 5B illustrate the existing AM and PM peak hour traffic volumes, respectively, at the three (3) key study intersections. ***Appendix A*** contains the appropriate backup data from the *Signal Hill Business Center Traffic Impact Analysis* (prepared by Kunzman Associates in July 2019).

Intersection Peak Hour Level of Service Methodology

Pursuant to the City of Signal Hill guidelines, existing AM and PM peak hour operating conditions for the key study intersections were evaluated using the *Intersection Capacity Utilization* (ICU) methodology for signalized intersections and the *Highway Capacity Manual* 6th Edition (HCM 6) methodology for unsignalized intersections.

Pursuant to the City of Long Beach guidelines, existing AM and PM peak hour operating conditions for the key signalized study intersections were evaluated using the *Highway Capacity Manual 6th Edition* (HCM 6) methodology.

Intersection Capacity Utilization (ICU) Method of Analysis

In conformance with City of Signal Hill and LA County CMP requirements, existing weekday peak hour operating conditions for the key signalized study intersections were evaluated using the Intersection Capacity Utilization (ICU) method. The ICU technique is intended for signalized intersection analysis and estimates the volume to capacity (V/C) relationship for an intersection based on the individual V/C ratios for key conflicting traffic movements. The ICU numerical value represents the percent signal (green) time, and thus capacity, required by existing and/or future traffic. It should be noted that the ICU methodology assumes uniform traffic distribution per intersection approach lane and optimal signal timing.

Per LA County CMP requirements, the ICU calculations use a lane capacity of 1,600 vehicles per hour (vph) for left-turn, through, and right-turn lanes, and dual left turn capacity of 2,880 vph. A clearance interval of 0.10 is also added to each Level of Service calculation.

The ICU value translates to a Level of Service (LOS) estimate, which is a relative measure of the intersection performance. The six qualitative categories of Level of Service have been defined along with the corresponding ICU value range and are shown in ***Table 1***. The ICU value is the sum of the critical volume to capacity ratios at an intersection; it is not intended to be indicative of the LOS of each of the individual turning movements.

HCM 6 Method of Analysis (Signalized Intersections)

Based on the HCM operations method of analysis, level of service for signalized intersections and approaches is defined in terms of control delay, which is a measure of the increase in travel time due to traffic signal control, driver discomfort and fuel consumption. Control delay includes the delay associated with vehicles slowing in advance of an intersection, the time spent stopped on an intersection approach, the time spent as vehicles move up in the queue and the time needed for vehicles to accelerate to their desired speed. LOS criteria for traffic signals are stated in terms of the control delay in seconds per vehicle. The LOS thresholds established for the automobile mode at a signalized intersection are shown in ***Table 2***.

HCM 6 Method of Analysis (Unsignalized Intersections)

The HCM unsignalized methodology for stop-controlled intersections was utilized for the analysis of the unsignalized intersections. LOS criteria for unsignalized

intersections differ from LOS criteria for signalized intersections as signalized intersections are designed for heavier traffic and therefore a greater delay.

Two-way stop-controlled intersections are comprised of a major street, which is uncontrolled, and a minor street, which is controlled by stop signs. Level of service for a two-way stop-controlled intersection is determined by the computed or measured control delay. The control delay by movement, by approach, and for the intersection as a whole is estimated by the computed capacity for each movement. LOS is determined for each minor-street movement (or shared movement) as well as major-street left turns. The worst side street approach delay is reported. LOS is not defined for the intersection as a whole or for major-street approaches, as it is assumed that major-street through vehicles experience zero delay. The HCM control delay value range for two-way stop-controlled intersections is shown in ***Table 3.***

City of Signal Hill Level of Service Criteria

According to the City of Signal Hill significant impact criteria, impacts to local and regional transportation systems are considered significant if:

Signalized Intersections:

- Intersection with more than 40 project trips, and
- An unacceptable peak hour LOS (i.e. LOS E or F) at any of the key study intersections is projected. The City of Signal Hill considers LOS D (ICU = 0.801 - 0.900) to be the minimum acceptable LOS for all intersections, and
- The project increases traffic demand at the study intersection by 2% of capacity (ICU increase ≥ 0.020), causing or worsening LOS E or F (ICU > 0.901).
- Intersection left-turn queue lengths exceed the existing storage lengths.

Unsignalized Intersections:

- The project causes an intersection operating at LOS D or better to degrade to LOS E or F, and the traffic signal warrant analysis determines that a traffic signal is justified.

City of Long Beach Level of Service Criteria

According to the City of Long Beach significant impact criteria, impacts to local and regional transportation systems are considered significant if:

Signalized Intersections:

- The project causes a study intersection to deteriorate from Level of Service (LOS) D to LOS E or F. The City of Long Beach considers LOS D to be the minimum acceptable LOS for all intersections; or

- The project increases average control delay at the study intersection by 2.5 seconds or more when an intersection is operating at LOS E or F in the baseline condition.
- The 95th percentile queue length exceeds the available storage length at any turn bay under project conditions.

Unsignalized Intersections:
- The intersection operates at LOS E or F, and the intersection meets the peak-hour traffic signal warrant after the addition of project traffic.

TRAFFIC FORECASTING METHOD OF ANALYSIS

In order to estimate the traffic impact characteristics of the proposed Project, a multi-step process has been utilized. The first step is traffic generation, which estimates the total arriving and departing traffic on a peak hour and daily basis. The traffic generation potential is forecast by applying the appropriate vehicle trip generation equations or rates to the Project development tabulation.

The second step of the forecasting process is traffic distribution, which identifies the origins and destinations of inbound and outbound project traffic. These origins and destinations are typically based on demographics and existing/expected future travel patterns in the study area.

The third step is traffic assignment, which involves the allocation of Project traffic to study area streets and intersections. Traffic assignment is typically based on minimization of travel time, which may or may not involve the shortest route, depending on prevailing operating conditions and travel speeds. Traffic distribution patterns are indicated by general percentage orientation, while traffic assignment allocates specific volume forecasts to individual roadway links and intersection turning movements throughout the study area.

With the forecasting process complete and Project traffic assignments developed, the impact of the Project is isolated by comparing operational (LOS) conditions at selected key intersections and road segment using expected future traffic volumes with and without forecast Project traffic. The need for site-specific and/or cumulative local area traffic improvements can then be evaluated.

PROJECT TRAFFIC CHARACTERISTICS

Project Trip Generation

Table 4 presents the trip generation assessment for the Project. Based on the application of ITE trip generation rates for "Junior Community College", and

empirical trip rates from a prior LLG study for Orange Coast College in Costa Mesa, trip generation estimates were calculated for the existing and future student enrollment to estimate potential increases in trips due to the Project. As *Table 4* indicates, the application of ITE and empirical trip rates for Junior/Community Colleges would result in a nominal increase in trips generated by the Project.

A review of the middle portion of *Table 4* indicates that the proposed Project, utilizing ITE trip rates, is forecast to generate a net increase of approximately 59 daily trips, with 5 trips (4 inbound, 1 outbound) produced in the AM peak hour and 5 trips (3 inbound, 2 outbound) produced in the PM peak hour on a "typical" weekday. Similarly, the proposed Project, utilizing empirical trip rates, is forecast to generate a net increase of approximately 65 daily trips, with 7 trips (6 inbound, 1 outbound) produced in the AM peak hour and 7 trips (4 inbound, 3 outbound) produced in the PM peak hour on a "typical" weekday. As a conservative step, the potential impact of the Project has been analyzed using the greater net increase in trips (i.e. utilizing the empirical trip rates; 7 trips during the AM peak hour and 7 trips during the PM peak hour).

So as not to add to the peak commute morning and afternoon traffic congestion, AURA's starting and ending bells will not coincide with the Signal Hill Elementary School also near the intersection of E. Hill and Walnut Avenue, and the typical PM peak hour from 5:00 PM to 6:00 PM. In addition, students who attend the High School will only be allowed a total of 20 parking permits. Permit preference will go first to seniors and then by birth date if additional spots are available. Based on this, student vehicle trips generated by AURA, including drop-off and pick-up trips, would therefore not occur during the typical AM and PM peak commute periods analyzed in this traffic study.

Project Trip Distribution and Assignment

The directional traffic distribution pattern for the proposed Project is presented in ***Figure 6***. It should be noted that the distribution traffic distribution pattern presented in *Figure 6* has been derived from the passenger car distribution patterns (i.e. *Figures 14 & 15*) from the *Signal Hill Business Center Traffic Impact Analysis* (prepared by Kunzman Associates in July 2019). Project traffic volumes both entering and exiting the site have been distributed and assigned to the adjacent street system based on the following considerations:

- the site's proximity to major traffic carriers and regional access routes,
- expected localized traffic flow patterns based on adjacent street channelization, and presence of traffic signals,
- existing traffic volumes, and
- ingress/egress availability at the Project site.

The anticipated AM and PM peak hour traffic volumes associated with the proposed Project at the three (3) key study intersection are presented in ***Figures 7A*** and ***7B***, respectively. The traffic volume assignments presented in *Figures 7A* and *7B* reflect the traffic distribution characteristics shown in *Figure 6* and the traffic generation forecast presented in *Table 4* (i.e. 7 AM peak hour trips and 7 PM peak hour trips).

Additionally, ***Table 5*** presents a summary of the project-related added peak hour traffic volumes at the three (3) study intersections, based on the traffic distribution characteristics shown in *Figure 6* and the traffic generation forecast presented in *Table 4,* and indicates whether the project trips exceed either the City of Signal Hill's peak hour trip threshold of 40 trips or the City of Long Beach's peak hour trip threshold of 50 trips. Review of *Table 5* shows that the three (3) intersections do not meet the peak hour trip threshold for analysis. However, they have been included in this analysis per the City's requirements to fully assess the potential impact in the immediate area of the Project.

FUTURE TRAFFIC CONDITIONS

Existing (Year 2021) Plus Project Traffic Volumes

The Existing (Year 2021) Plus Project traffic conditions have been generated based upon existing conditions and the estimated Project traffic. These forecast traffic conditions have been prepared pursuant to the City's requirement, which requires that the potential impacts of a Project be evaluated upon the circulation system, as it currently exists. This traffic volume scenario and the related analysis will identify the roadway improvements necessary to mitigate the direct traffic impacts of the Project, if any.

Figures 8A and ***8B*** present the projected AM and PM peak hour traffic volumes, respectively, at the three (3) key study intersections with the addition of the trips generated by the proposed Project to existing peak hour traffic volumes.

General Plan Buildout (Year 2040) Plus Project Traffic Volumes

Per City of Signal Hill direction, General Plan Buildout (Year 2040) traffic volumes for the three (3) key study intersections are taken from the General Plan Buildout (Year 2040) With Project Peak Hour Turning Movement Volumes (*Figures 37 & 38*) from the *Signal Hill Business Center Traffic Impact Analysis* (prepared by Kunzman Associates in July 2019).

Figures 9A and ***9B*** illustrate the General Plan Buildout (Year 2040) AM and PM peak hour traffic volumes, respectively, at the three (3) key study intersections.

Figures 10A and ***10B*** illustrate the General Plan Buildout (Year 2040) AM and PM peak hour traffic volumes, respectively, with the inclusion of the trips generated by the proposed Project.

EXISTING (YEAR 2021) PLUS PROJECT CAPACITY ANALYSIS

Table 6 summarizes the peak hour level of service results at the three (3) key study intersections for Existing (Year 2021) Plus Project traffic conditions. Review of column (1) of *Table 6* indicates that all of the key study intersections currently operate at LOS C or better during the weekday AM and PM peak hours. Review of columns (2) and (3) of *Table 6* indicates that all of the key study intersections are forecast to operate at acceptable LOS C or better during the weekday AM and PM peak hours under Existing Plus Project traffic conditions.

G.P.B. (YEAR 2040) PLUS PROJECT CAPACITY ANALYSIS

Table 7 summarizes the peak hour level of service results at the three (3) key study intersections for General Plan Buildout (Year 2040) Plus Project traffic conditions. Review of column (2) of *Table 7* indicates that all of the key study intersections are forecast to continue to operate at acceptable LOS C or better during the weekday AM and PM peak hours under General Plan Buildout (Year 2040) traffic conditions.

Review of columns (3) and (4) of *Table 7* indicates that all of the key study intersections are forecast to operate at acceptable LOS C or better during the weekday AM and PM peak hours under General Plan Buildout (Year 2040) Plus Project traffic conditions.

Appendix B contains the detailed peak hour level of service worksheets for the study intersections evaluated in this report utilizing the ICU methodology. ***Appendix C*** contains the detailed peak hour level of service worksheets for the study intersections evaluated in this report utilizing the HCM methodology.

INTERSECTION VEHICLE QUEUEING ANALYSES

Excessive left-turn vehicle queuing which extends into and/or blocks adjacent through travel lanes may have detrimental effects on intersection operations and the roadway network as a whole in ways not otherwise accounted for by the ICU methodology. Therefore, left-turn vehicle queuing at the two (2) signalized study intersections were evaluated in order to identify the effects of project traffic on left-turn queuing at the intersections. Additionally, to address the City's concerns, vehicle queueing at the one (1) unsignalized study intersection (Walnut Avenue at Hill Street)

was also evaluated to ensure the queues do not impact the intersection of Gaviota Avenue at Hill Street (i.e. westbound approach queue).

The left-turn vehicle queuing analysis was prepared utilizing the HCM methodology for signalized intersections using Vistro 2020 software. The HCM methodology considers traffic volume data, lane configurations, and traffic signal phasing in order to calculate the 95th percentile queues for the respective traffic movements. The 95th percentile queue represents the maximum back of vehicle queue with 95th percentile traffic volumes (i.e., actual traffic volumes will exceed the 95th percentile volumes 5 percent of the time) and is commonly used for design purposes.

The left-turn vehicle queuing analysis was based on the forecast weekday AM and PM intersection turning movement volumes utilized in the level of service analyses. The existing left-turn lane configurations and storage lengths were determined based on a review of aerial maps of the subject intersections obtained from Google Earth and on field reviews conducted by LLG Engineers. A minimum vehicle length of 25 feet is assumed for purposes of this analysis.

Table 8 presents the left-turn queueing analyses results for the three (3) study intersections. Column 1 presents the queuing results for existing traffic conditions. Column 2 presents the results for existing plus project traffic conditions. ***Table 9*** presents the left-turn queueing analyses results for the three (3) study intersections. Column 1 presents the queuing results for General Plan Buildout (Year 2040) traffic conditions. Column 2 presents the results for General Plan Buildout (Year 2040) Plus Project traffic conditions.

Existing (Year 2021) Traffic Conditions
Review of Column 1 of *Table 8* indicates that the three (3) study intersections have queues that are adequately accommodated by the existing storage space.

Existing (Year 2021) Plus Project Traffic Conditions
Review of Column 2 of *Table 8* indicates that the three (3) study intersections have queues that are adequately accommodated by the existing storage space.

General Plan Buildout (Year 2040) Traffic Conditions
Review of Column 1 of *Table 9* indicates that the three (3) study intersections have queues that are adequately accommodated by the existing storage space.

General Plan Buildout (Year 2040) Plus Project Traffic Conditions
Review of Column 2 of *Table 9* indicates that the three (3) study intersections have queues that are adequately accommodated by the existing storage space.

SIGHT DISTANCE ANALYSIS

In support of evaluating the Project's site access, a sight line assessment was prepared to validate the adequacy of sight lines at the Project's four (4) driveways located along Walnut Avenue.

The line of sight evaluation was prepared according to the general engineering practices for stopping sight distance analysis as documented in the State of California Department of Transportation (Caltrans) *Highway Design Manual (HDM).*

This assessment is based on the intersection sight distance requirements as published in the Caltrans *HDM* and focuses on the sight distance requirements for the Project's driveways located along Walnut Avenue. The Sight Distance Evaluation prepared for the proposed driveways was based on the criteria and procedures set forth by the California Department of Transportation (Caltrans) in the State's *Highway Design Manual* for "Private Road Intersections".

The *Highway Design Manual (HDM),* in Section 405.1(2)(c), page 400-22, indicates that for Private Road Intersections, "The minimum corner sight distance shall be equal to the stopping sight distance as given in Table 201.1...", where stopping sight distance is defined as the distance required by the driver of a vehicle, traveling at a given speed, to bring his vehicle to a stop after an object on the road becomes visible. Stopping sight distance is measured from the driver's eyes, which are assumed to be 3.5 feet above the pavement surface, to an object 0.5-foot high on the roadway. The speed used in determining stopping sight distance is defined as the "critical speed" or 85th percentile speed which is the speed at which 85% of the vehicles are traveling at or less. The critical speed is the single most important factor in determining stopping sight distance. Table 201.1 in the HDM is used in determining stopping sight distance based on the critical speed of vehicles on the affected roadway. For this analysis, a design speed of 30 miles per hour (mph) for Walnut Avenue, which is the existing posted speed limit for these roadways, was utilized. Using Table 201.1, titled *Sight Distance Standards,* in the State's *HDM* for stopping, a minimum stopping sight distance of 200 feet is required.

To provide a conservative assessment, the "corner sight distance" criteria in Section 405.1(2)(b) of the *HDM* was also utilized. Based on the criteria set forth in Table 405.1A of the *HDM* and a posted speed limit of 30 mph on Walnut Avenue, a corner sight distance of 331 feet is required for exiting vehicles looking right (i.e. left-turning vehicles) and 287 feet is required for exiting vehicles looking left (i.e. left-turning and right-turning vehicles).

Figures 11 and ***12*** illustrate a schematic of the sight distance evaluation for the four (4) Project driveways along Walnut Avenue. These figures illustrate the limited use areas. Review of *Figures 11* and *12* indicate that sight distances at the four (4) Project Driveways along Walnut Avenue are expected to be adequate if obstructions within the sight triangles are minimized.

VEHICLE MILES TRAVELED (VMT) ASSESSMENT

The purpose of this Vehicle Miles Traveled (VMT) analysis is to evaluate the Project based on Senate Bill 743 (SB 743) requirements consistent with the *Technical Advisory on Evaluating Transportation Impacts In California Environmental Quality Act* (CEQA), December 2018, prepared by the State of California Governor's Office of Planning and Research (OPR). The OPR Technical Advisory provides project screening criteria and guidance for analysis of VMT assessments under SB 743. With the adopted guidelines, transportation impacts are to be evaluated based on a project's effect on vehicle miles traveled. Lead agencies are allowed to continue using their current impact criteria, or to opt into the revised transportation guidelines. However, the new guidelines must be used starting July 1, 2020, as required in CEQA section 15064.3.

The City of Signal Hill has yet to adopt criteria for evaluating VMT impacts under CEQA. However, it is our understanding that the City of Signal Hill may likely utilize criteria consistent with the OPR Technical Advisory, and may be open to considering the criteria which has been adopted by neighboring jurisdiction of the City of Long Beach.

For the VMT screening analysis, the presumption of less than significant impact near Transit Stations was applied to the proposed Project. Proposed CEQA Guideline Section 5064.3, subdivision (b), states that "generally, [land use] projects within one-half mile of either an existing major transit stop or an existing high-quality transit corridor should be presumed to cause a less than significant transportation impact". A high-quality transit corridor is defined as a corridor with fixed route bus service with service intervals no longer than 15 minutes during peak commute hours. Review of the Long Beach Transit Priority Areas Map from the *City of Long Beach Traffic Impact Analysis Guidelines dated June 2020* shows the Project falls within half a mile from high quality transit corridor or major transit stop. Since the proposed Project is considered to be located within half a mile of an existing high-quality transit corridor, this project can be screened from further VMT analysis and can be presumed to have a less than significant impact on VMT.

In addition, screening for small projects was also applied to the proposed Project. Consistent with the OPR Technical Advisory Section E.1 *Threshold for Small Projects*, projects that generate or attract fewer than 110 trips per day generally may be assumed to cause a less than significant transportation impact. Review of the trip generation estimates presented in *Table 4*, the proposed Project is forecast to generate 65 daily trips which is less than 110 daily trip threshold for small projects. As such the Project can be screened from further VMT analysis and can be presumed to have a less than significant impact on VMT.

CONCLUSIONS

- The proposed Project site is located at 1600 East Hill Street and is situated in a mixed industrial-residential area. The university campus sits on a rectangular-shaped, six-acre parcel of land that is located south of East Hill Street, between Walnut Avenue and Gaviota Avenue. AUHS has three separate buildings totaling 72,000 square feet (SF), with 237 surface parking spaces on site. The University has only one main campus and no branch locations. There is one remote learning site, Valley High School, where AUHS leases for science laboratory practice in Chemistry and Microbiology. As part of their Master Plan, AUHS proposes to offer new programs to supplement the programs of study now offered: Bachelor of Science in Nursing (SON-BSN) and Doctorate of Science in Pharmaceutical Sciences (SOP). The proposed new programs are the Master of Science in Nursing and Doctor of Nursing Practice within the School of Nursing (SON-MSN), American University Research Academy Private High School (AURA), AUHS School of Medicine (SOM), and The Outpatient Pediatrics Clinic and Pharmacy. It is anticipated that the current enrollment of 180 students would be increased to 470 students in the future, of which 231 students would be the maximum on-site attendance (239 students would be off-campus enrolled in off-site instruction and online programs).

- The proposed Project, utilizing empirical rates, is forecast to generate a net increase of approximately 59 daily trips, with 5 trips (4 inbound, 1 outbound) produced in the AM peak hour and 5 trips (3 inbound, 2 outbound) produced in the PM peak hour on a "typical" weekday. As a conservative step, the potential impact of the Project has been analyzed using the greater net increase in trips (i.e. utilizing the empirical trip rates instead of ITE trip rates).

- All of the key study intersections are forecast to operate at acceptable LOS C or better during the weekday AM and PM peak hours under Existing (Year 2021) Plus Project and General Plan Buildout (Year 2040) Plus Project traffic conditions.

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- The three (3) study intersections have queues that are adequately accommodated by the existing storage space.

- The sight distances at the four (4) Project Driveways along Walnut Avenue are expected to be adequate if obstructions within the sight triangles are minimized.

- Since the proposed Project is considered to be located within half a mile of an existing high-quality transit corridor, this project can be screened from further VMT analysis and can be presumed to have a less than significant impact on VMT. In addition, screening for small projects was also applied to the proposed Project. Consistent with the OPR Technical Advisory Section E.1 *Threshold for Small Projects*, projects that generate or attract fewer than 110 trips per day generally may be assumed to cause a less than significant transportation impact. The proposed Project is forecast to generate 65 daily trips which is less than 110 daily trip threshold for small projects. As such the Project can be screened from further VMT analysis and can be presumed to have a less than significant impact on VMT.

• • • • •

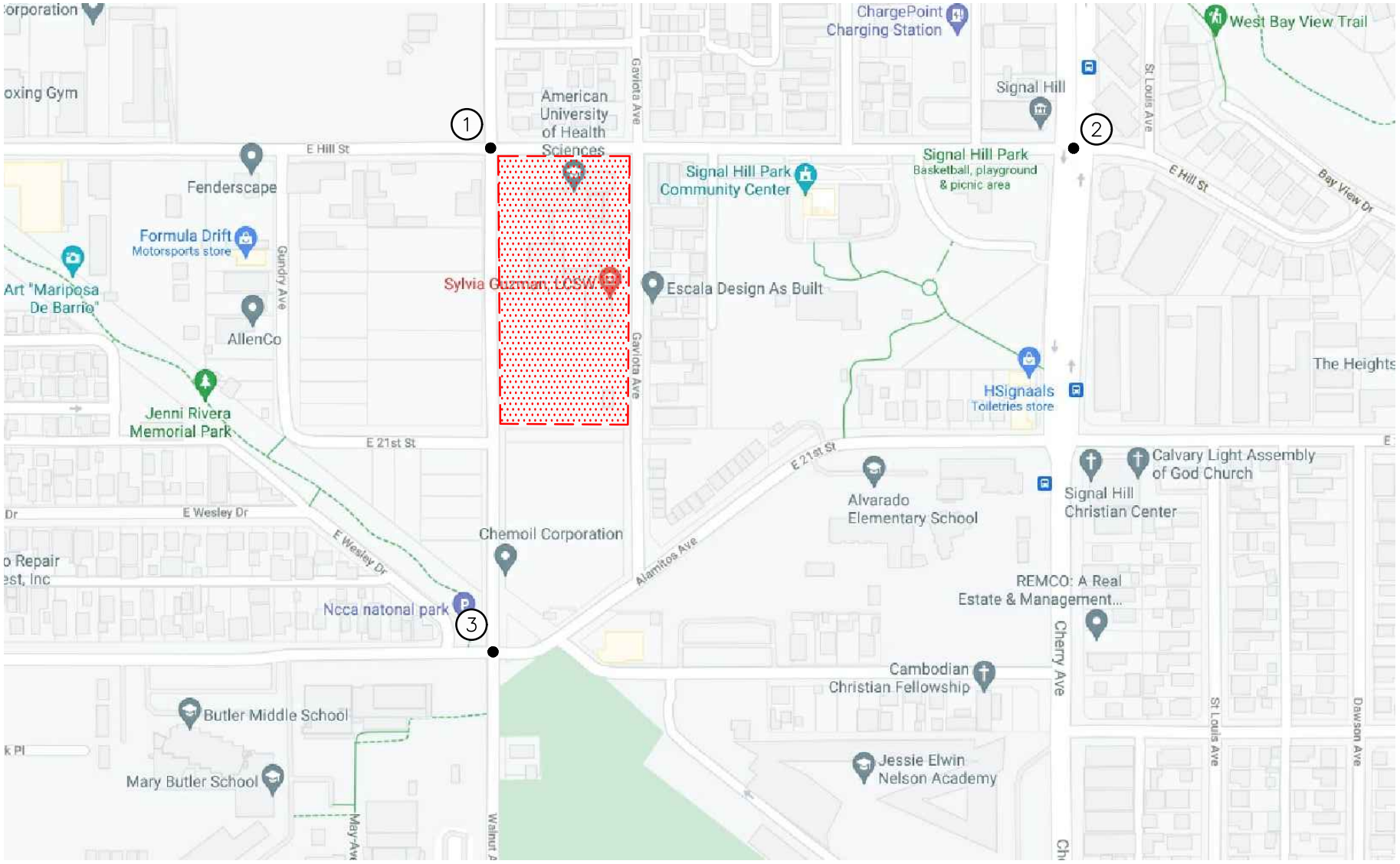
We appreciate the opportunity to provide this Focused Traffic Impact Assessment report for the proposed AUHS Master Plan. If you have any questions regarding this letter, please do not hesitate to call us at (949) 825-6175.

Very truly yours,
Linscott, Law & Greenspan, Engineers

Trissa (de Jesus) Allen, P.E.
Senior Transportation Engineer

Justin Tucker, P.E.
Transportation Engineer II

Attachments



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LINSCOTT LAW & GREENSPAN engineers

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SOURCE: GOOGLE

KEY

(#) = STUDY INTERSECTION

= PROJECT SITE

FIGURE 1

VICINITY MAP

AMERICAN UNIVERSITY OF HEALTH SCIENCES, SIGNAL HILL

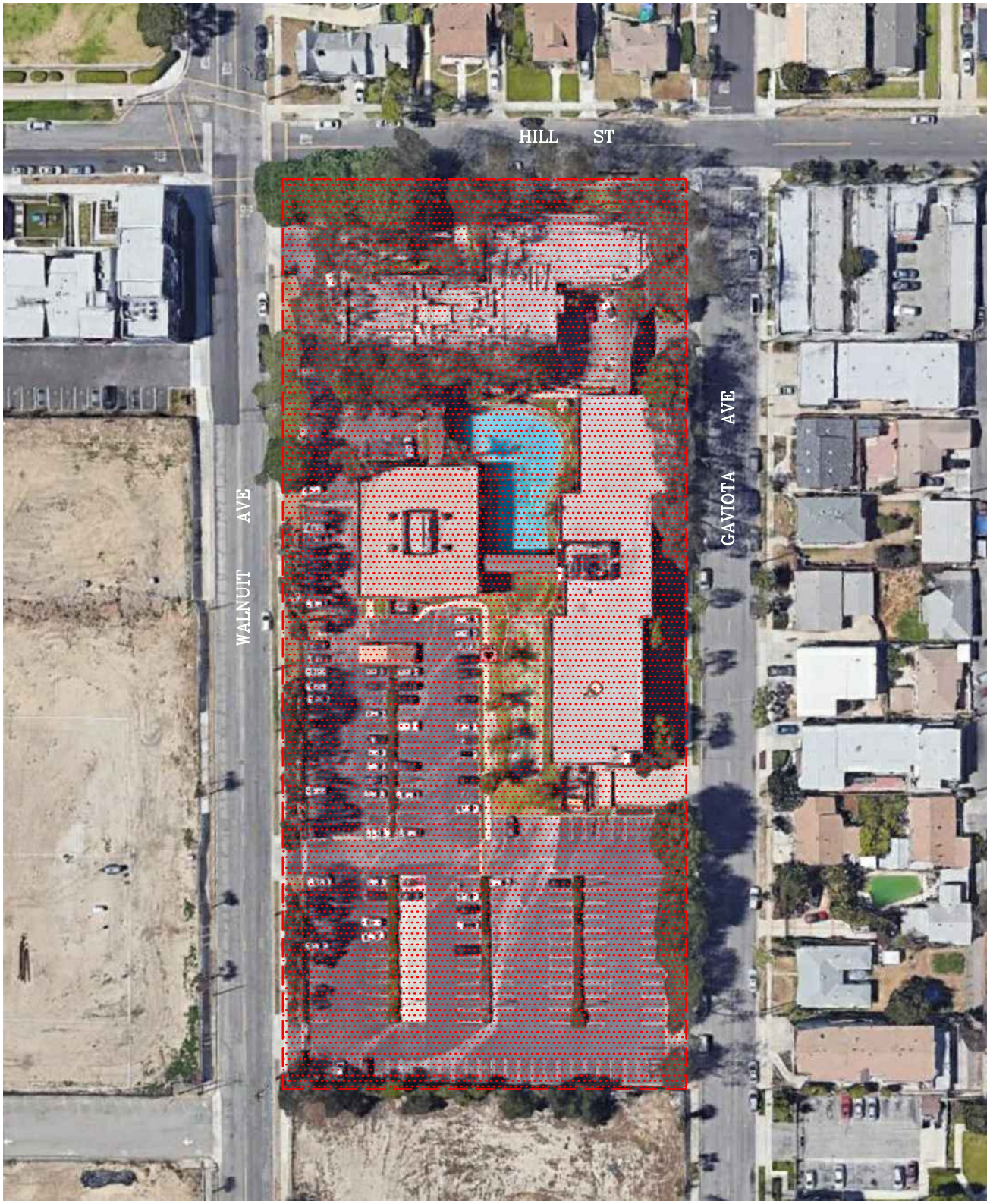

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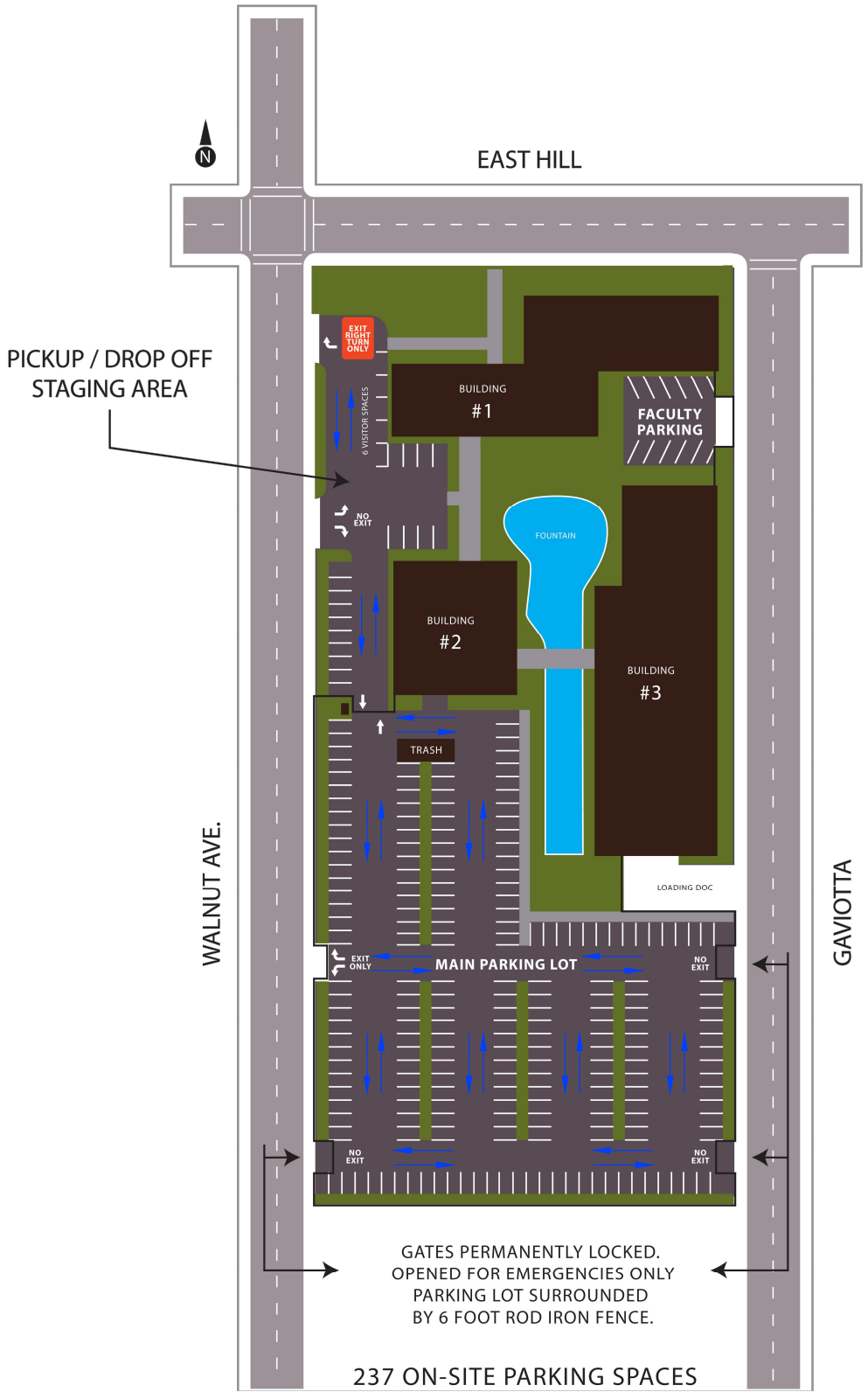
FIGURE 2

EXISTING SITE AERIAL

AMERICAN UNIVERSITY OF HEALTH SCIENCES, SIGNAL HILL



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LINSCOTT LAW & GREENSPAN engineers

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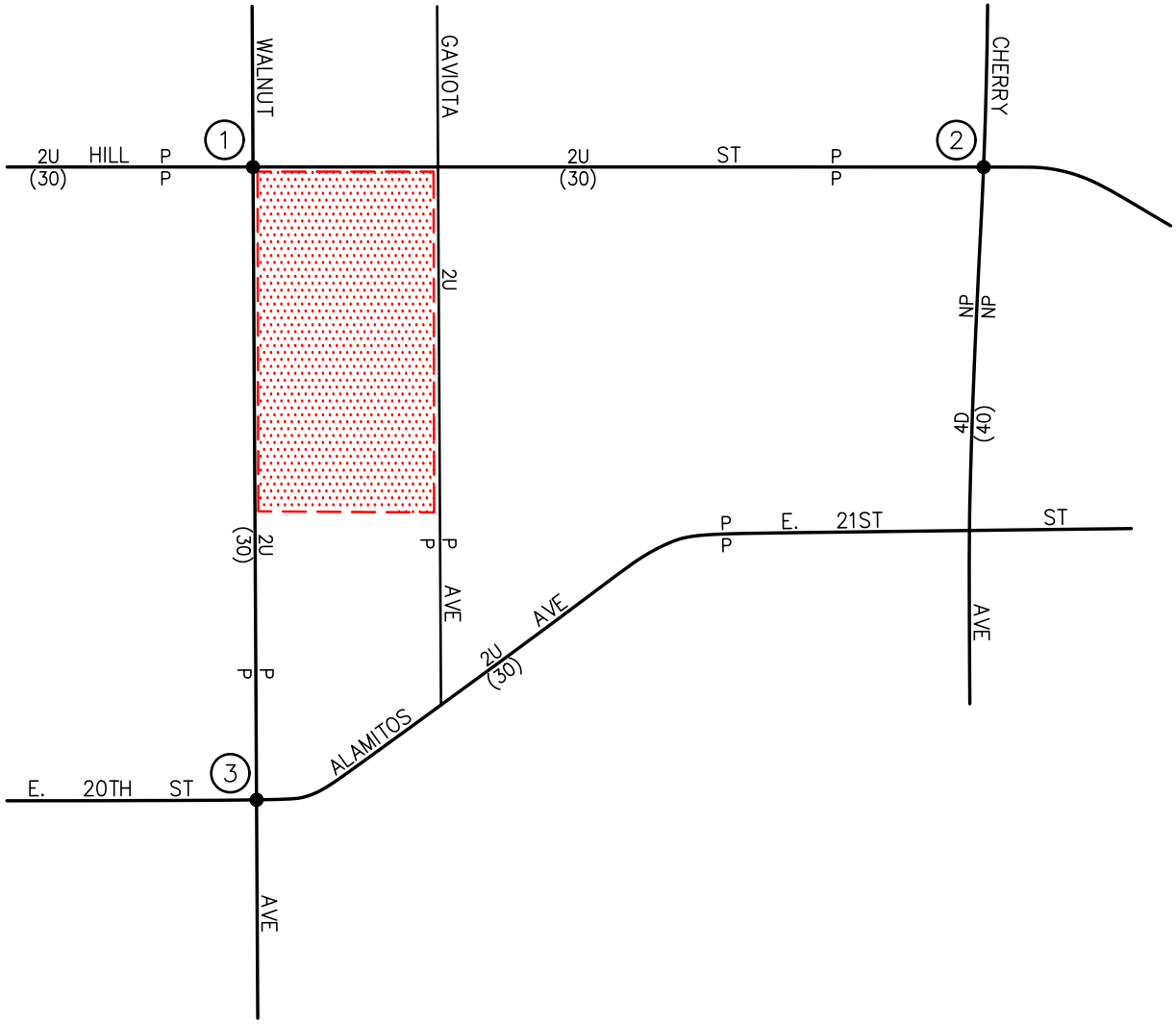
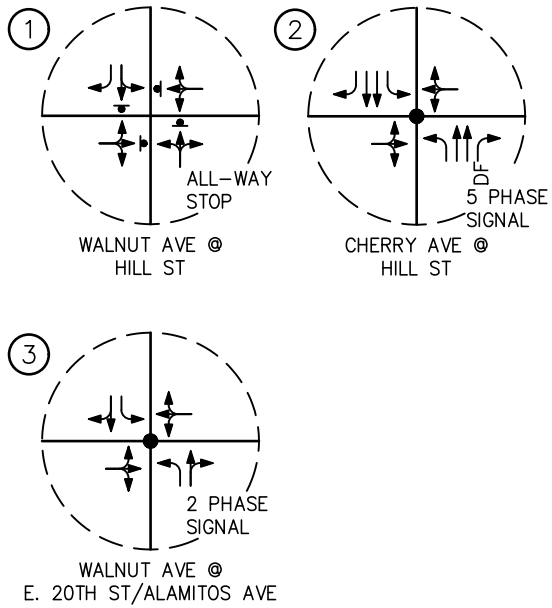
FIGURE 3

PROJECT SITE PLAN

AMERICAN UNIVERSITY OF HEALTH SCIENCES, SIGNAL HILL





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LINSCOTT LAW & GREENSPAN engineers

N NO SCALE

KEY

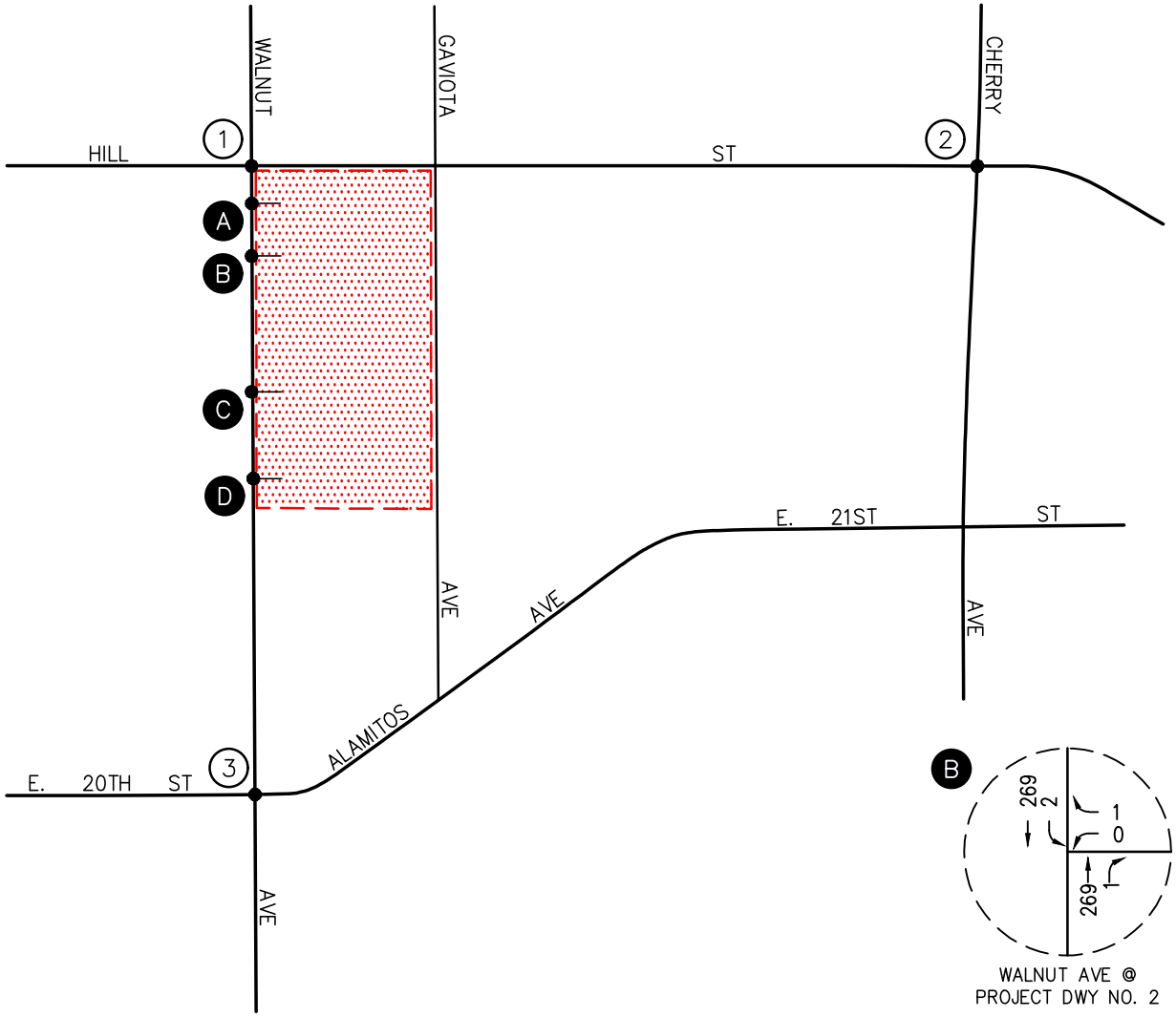
(#) = STUDY INTERSECTION
= APPROACH LANE ASSIGNMENT
● = TRAFFIC SIGNAL, ☛ = STOP SIGN
P = PARKING, NP = NO PARKING
DF = DE FACTO RIGHT-TURN

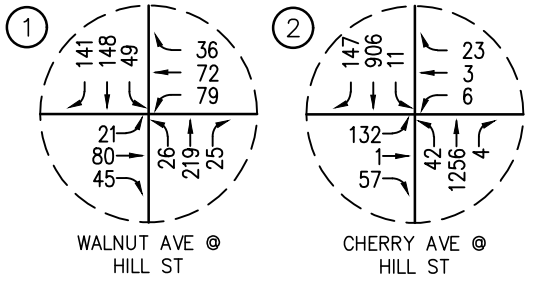
U = UNDIVIDED, D = DIVIDED
2 = NUMBER OF TRAVEL LANES
(XX)= POSTED SPEED LIMIT (MPH)
= PROJECT SITE

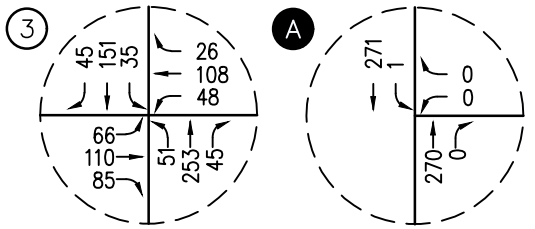
FIGURE 4

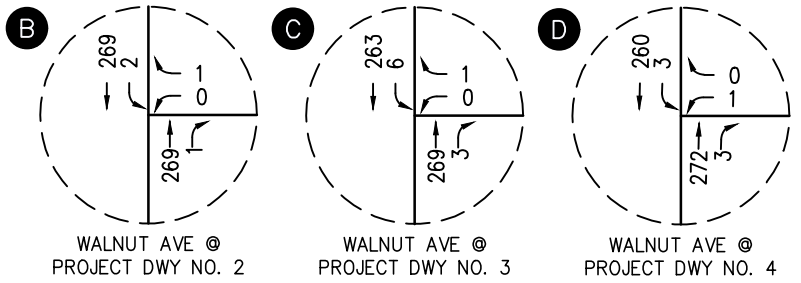
EXISTING ROADWAY CONDITIONS AND INTERSECTION CONTROLS

AMERICAN UNIVERSITY OF HEALTH SCIENCES, SIGNAL HILL









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LINSCOTT LAW & GREENSPAN engineers

N NO SCALE

KEY

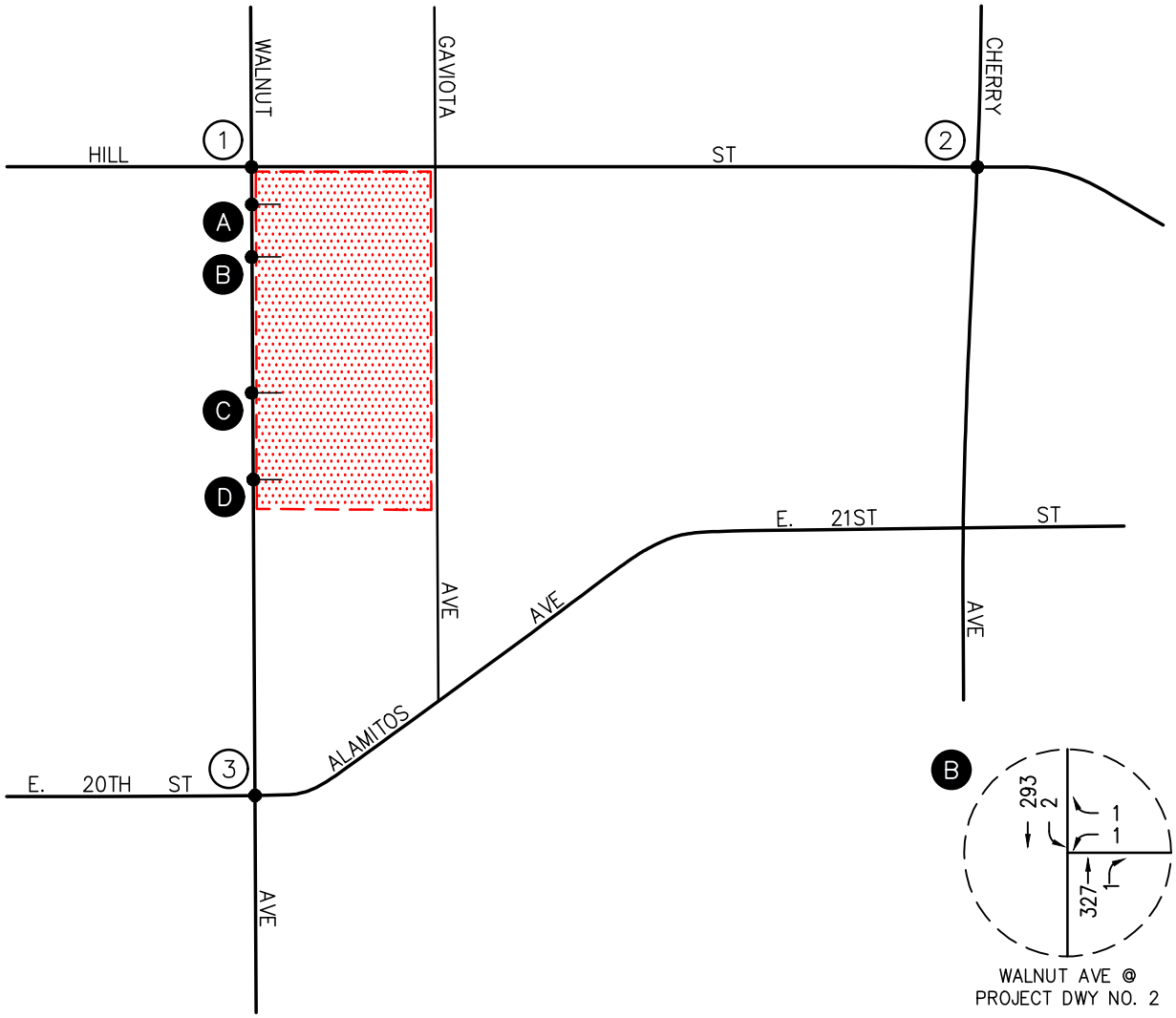
(#) = STUDY INTERSECTION

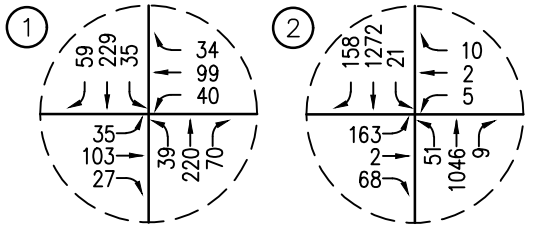
= PROJECT SITE

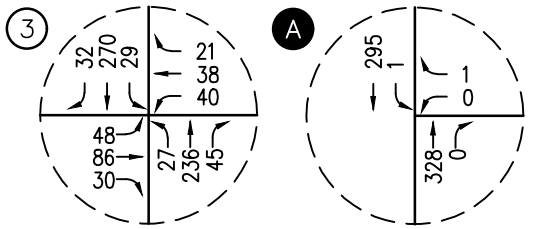
FIGURE 5A

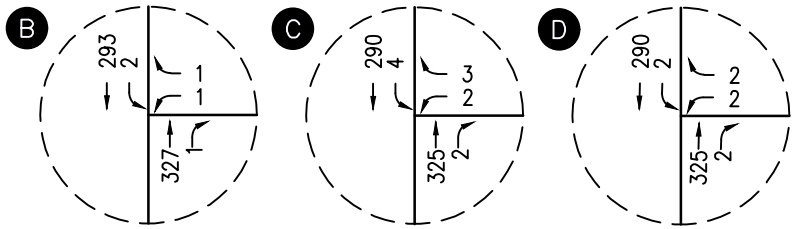
EXISTING (2021) AM PEAK HOUR TRAFFIC VOLUMES

AMERICAN UNIVERSITY OF HEALTH SCIENCES, SIGNAL HILL









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N NO SCALE

KEY

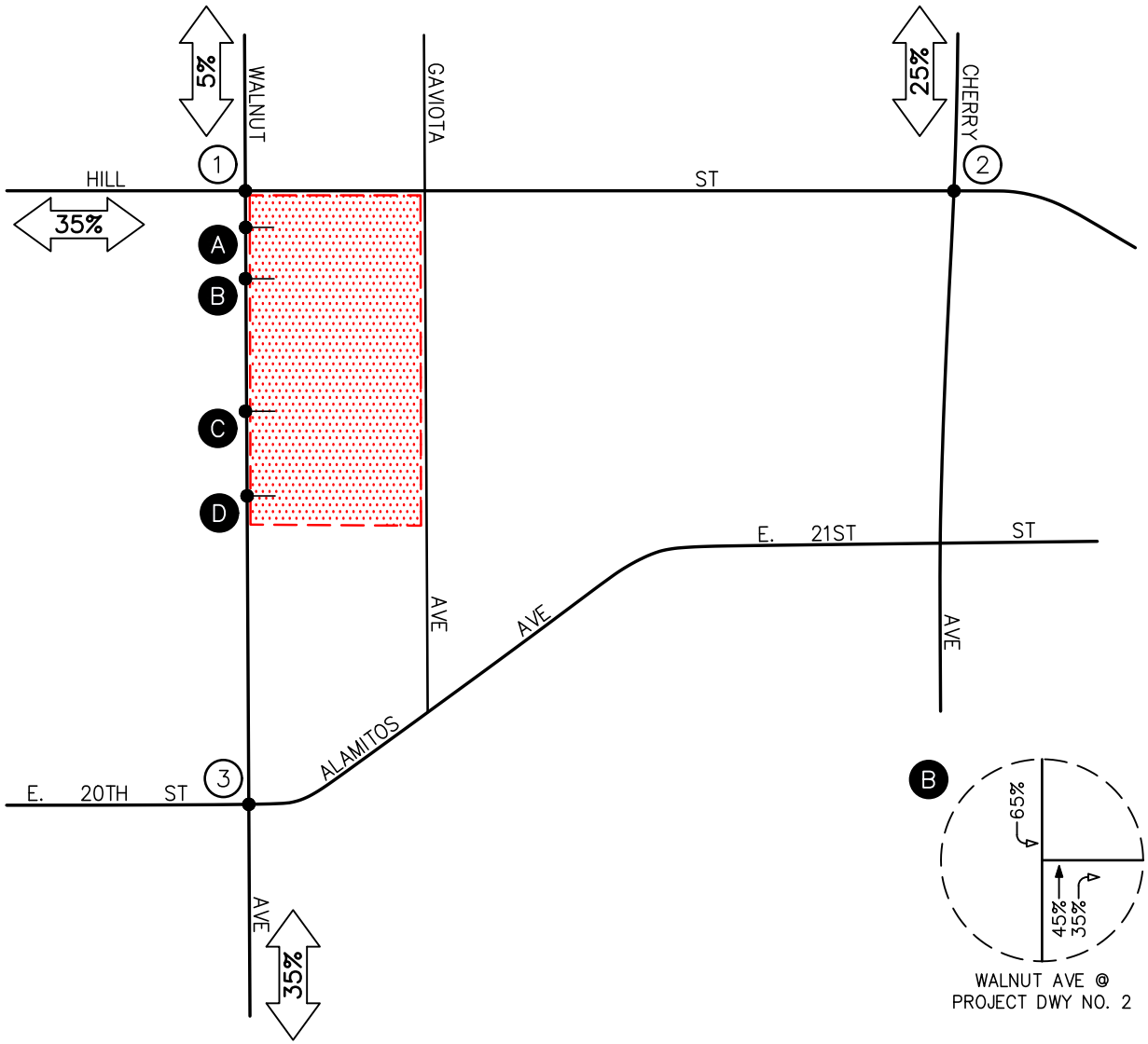
(#) = STUDY INTERSECTION

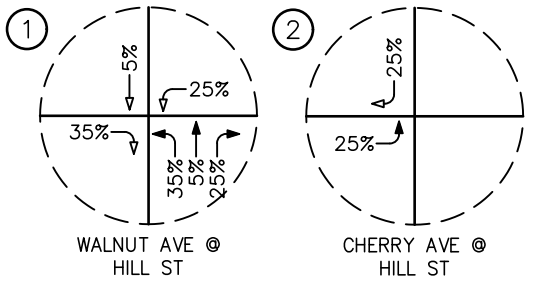
= PROJECT SITE

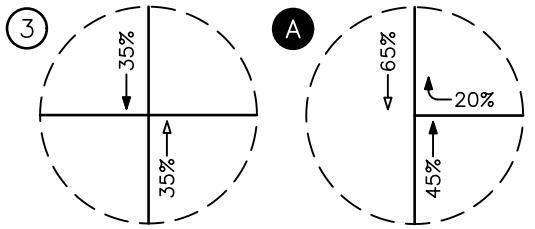
FIGURE 5B

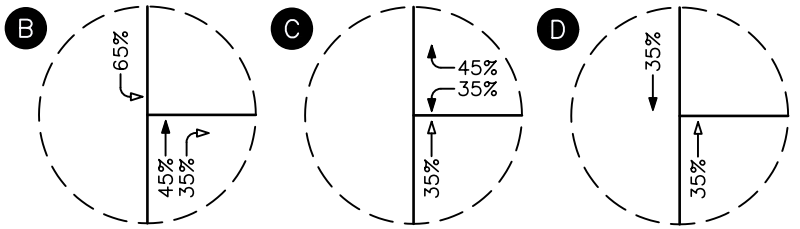
EXISTING (2021) PM PEAK HOUR TRAFFIC VOLUMES

AMERICAN UNIVERSITY OF HEALTH SCIENCES, SIGNAL HILL









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N NO SCALE

KEY

(#) = STUDY INTERSECTION

= INBOUND PERCENTAGE

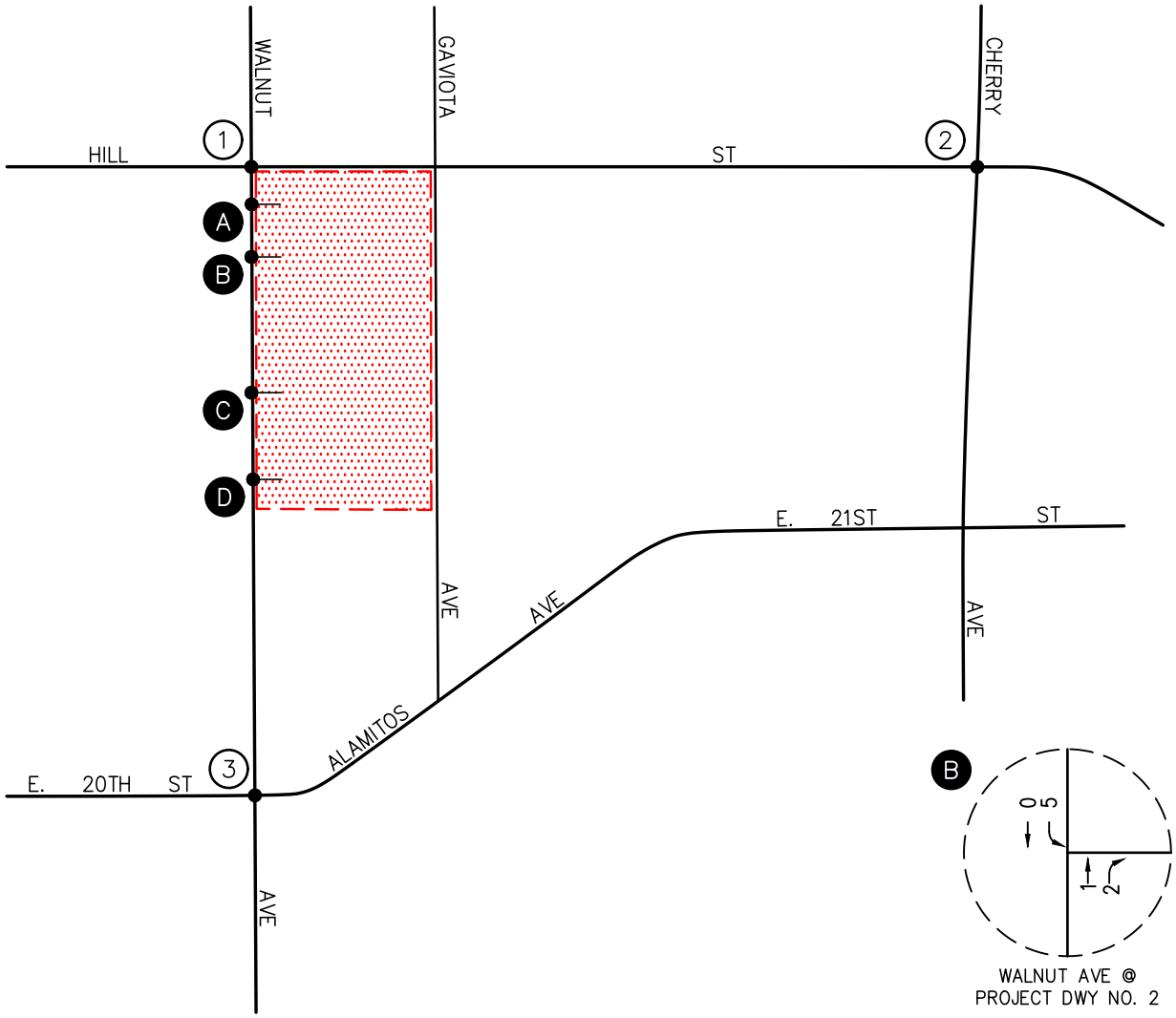
= OUTBOUND PERCENTAGE

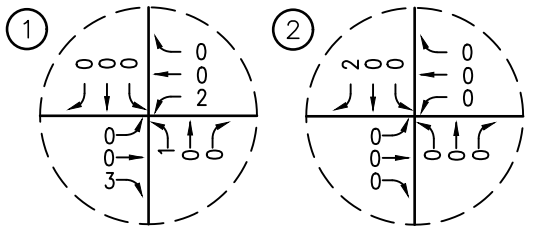
= PROJECT SITE

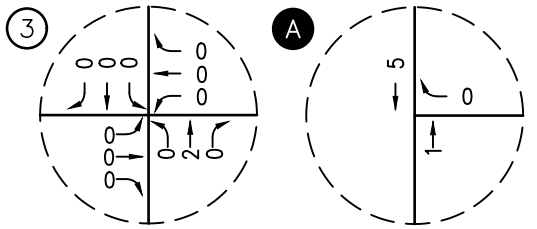
FIGURE 6

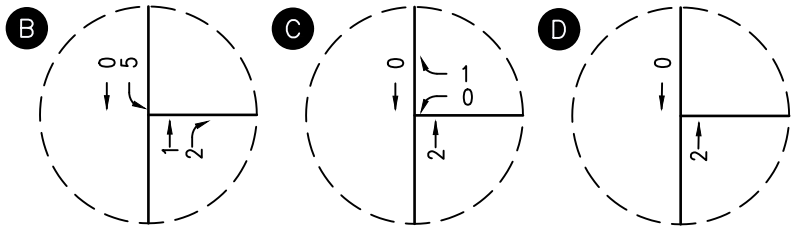
PROJECT TRAFFIC DISTRIBUTION PATTERN

AMERICAN UNIVERSITY OF HEALTH SCIENCES, SIGNAL HILL









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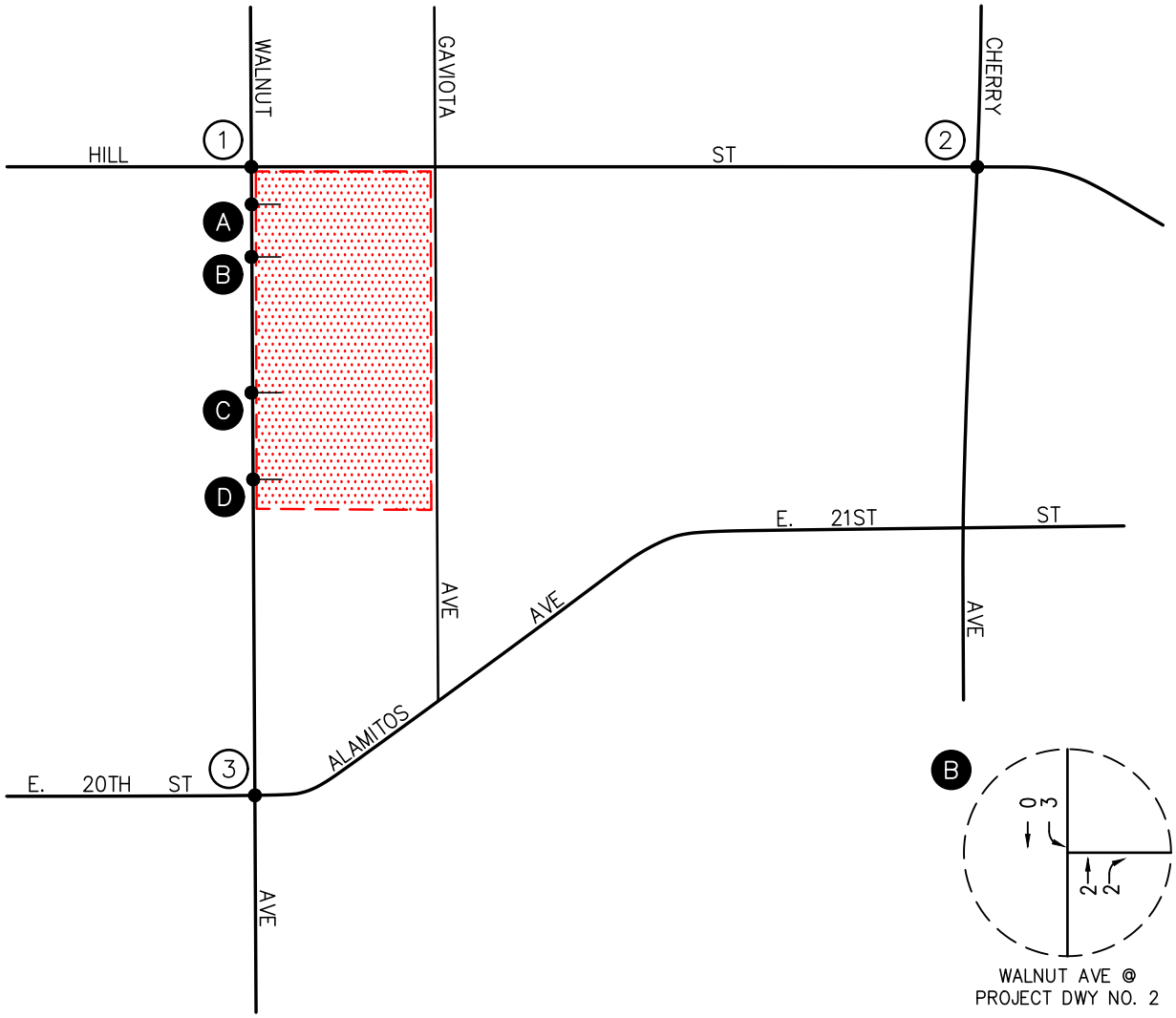
NO SCALE

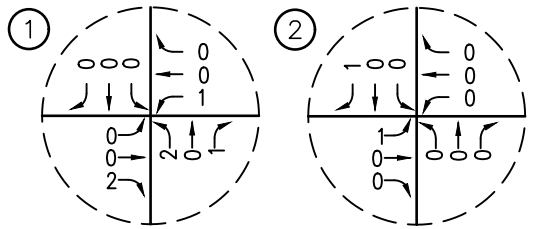
KEY
(#) = STUDY INTERSECTION
= PROJECT SITE

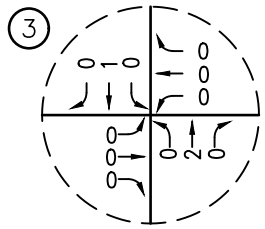
FIGURE 7A

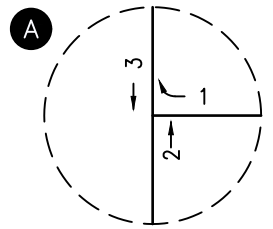
PROJECT TRAFFIC VOLUMES AM PEAK HOUR

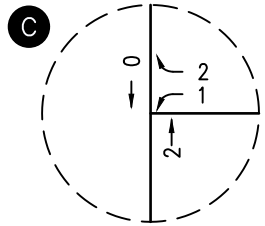
AMERICAN UNIVERSITY OF HEALTH SCIENCES, SIGNAL HILL

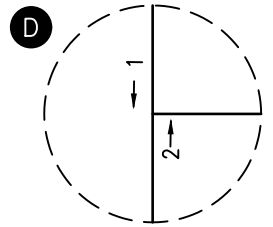












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engineers

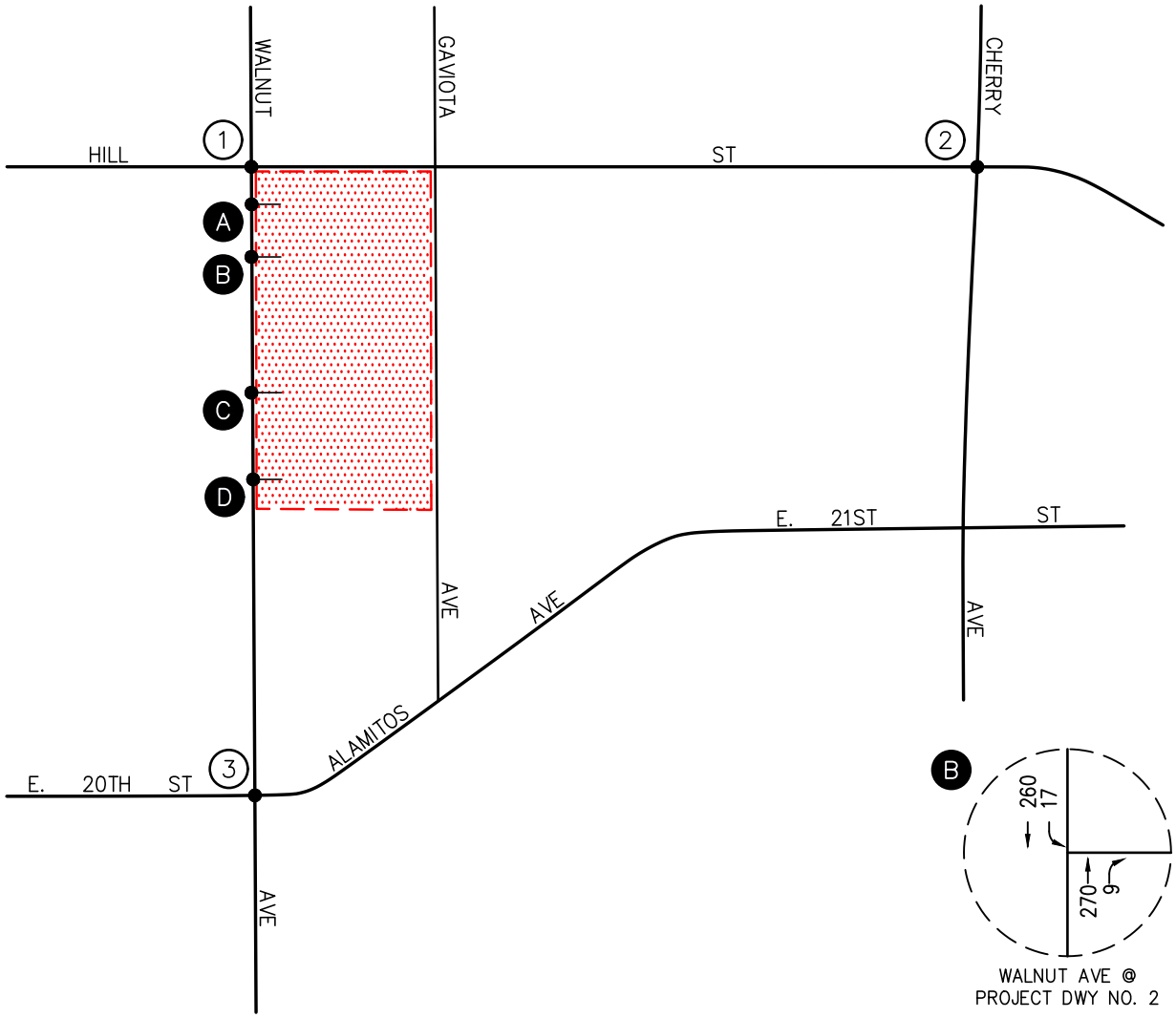
N NO SCALE

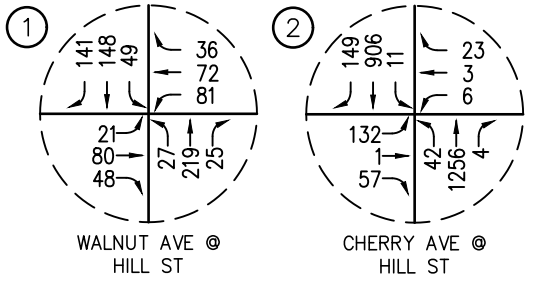
KEY
(#) = STUDY INTERSECTION
= PROJECT SITE

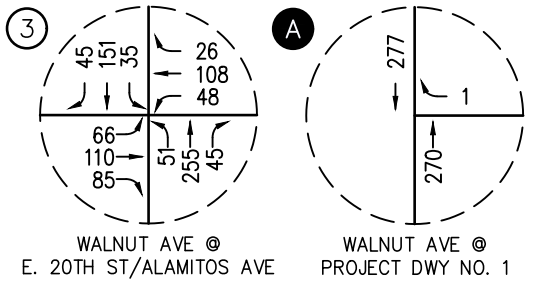
FIGURE 7B

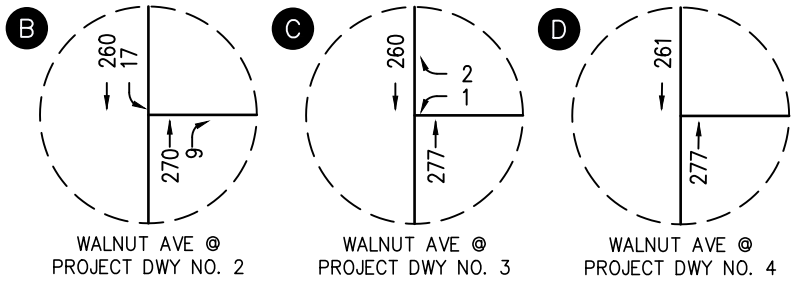
PROJECT TRAFFIC VOLUMES PM PEAK HOUR

AMERICAN UNIVERSITY OF HEALTH SCIENCES, SIGNAL HILL









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KEY

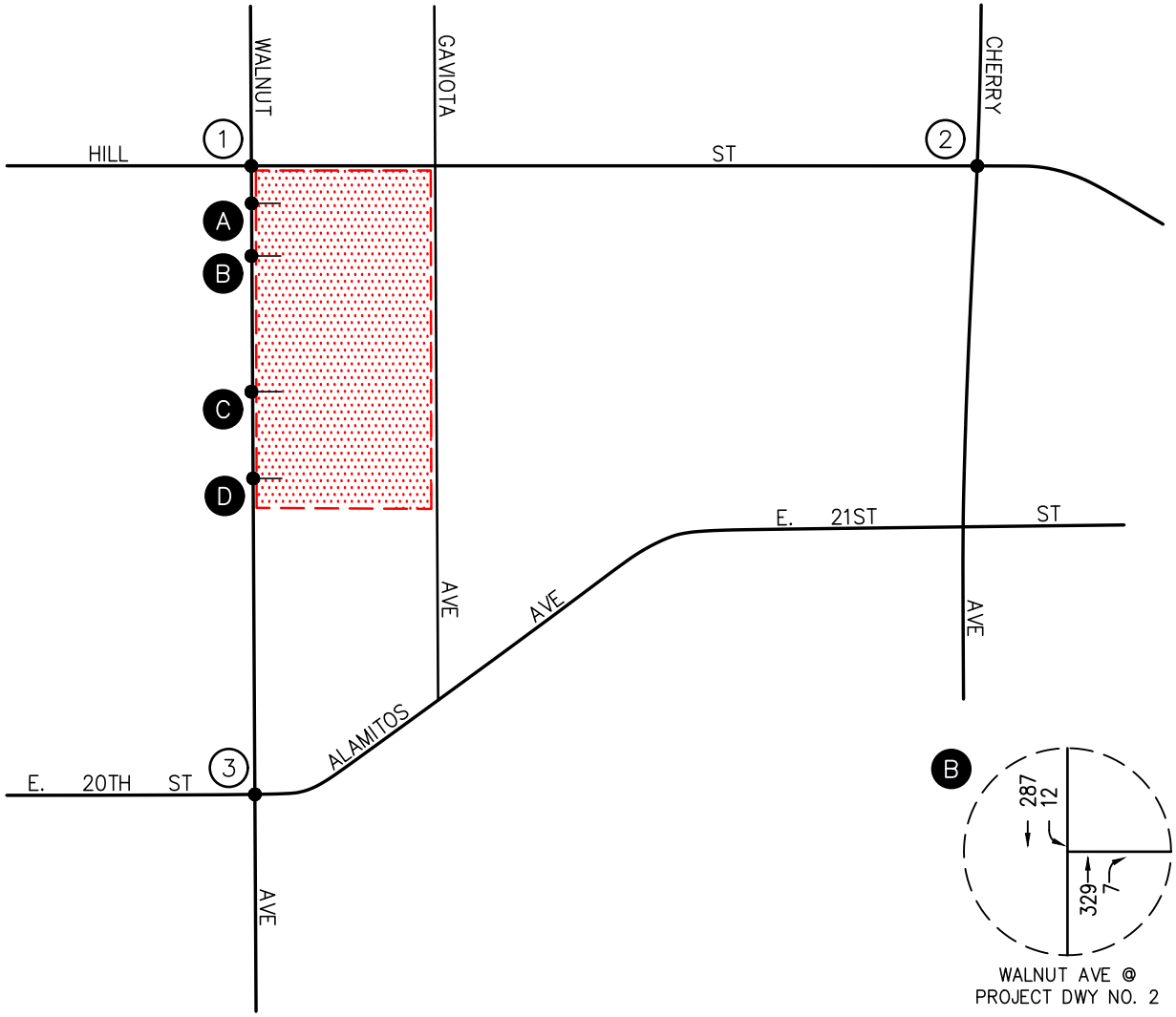
(#) = STUDY INTERSECTION

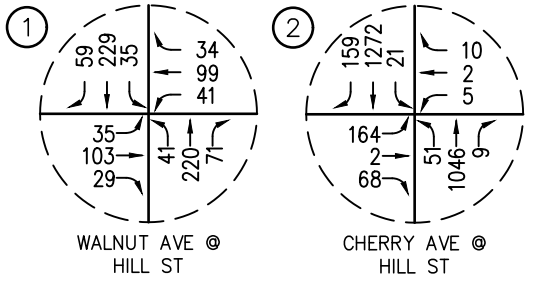
= PROJECT SITE

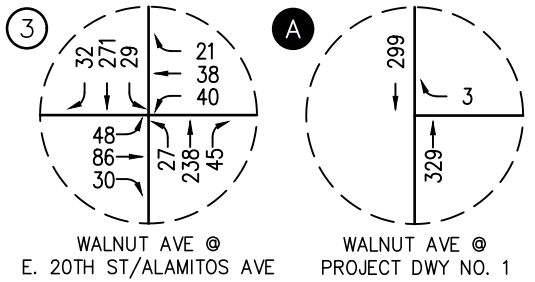
FIGURE 8A

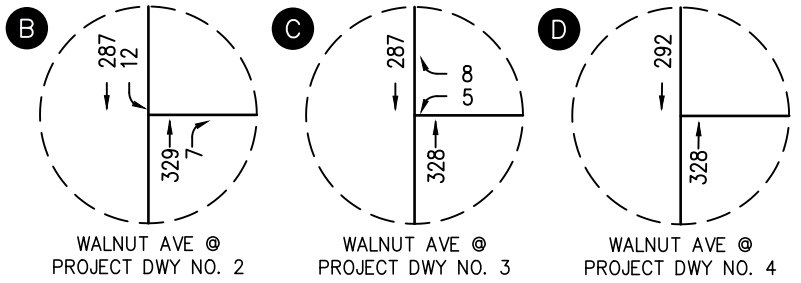
EXISTING (2021) PLUS PROJECT AM PEAK HOUR TRAFFIC VOLUMES

AMERICAN UNIVERSITY OF HEALTH SCIENCES, SIGNAL HILL









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N NO SCALE

KEY

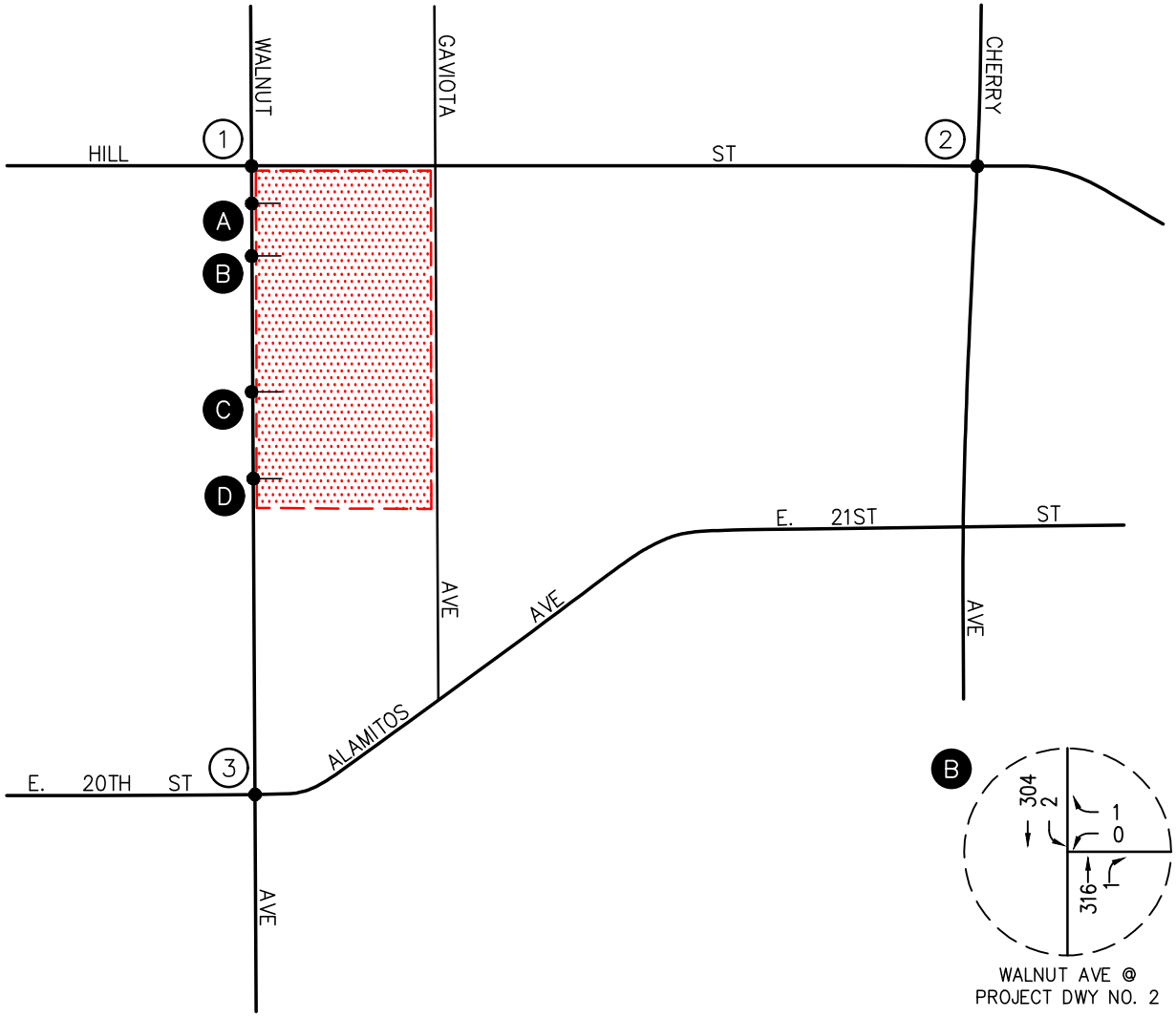
(#) = STUDY INTERSECTION

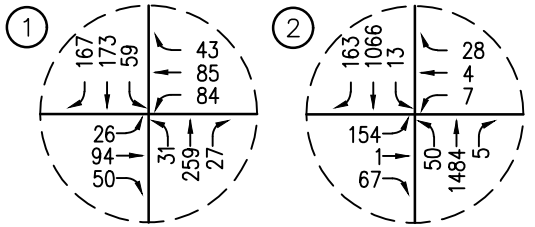
= PROJECT SITE

FIGURE 8B

EXISTING (2021) PLUS PROJECT PM PEAK HOUR TRAFFIC VOLUMES

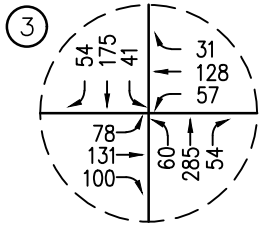
AMERICAN UNIVERSITY OF HEALTH SCIENCES, SIGNAL HILL



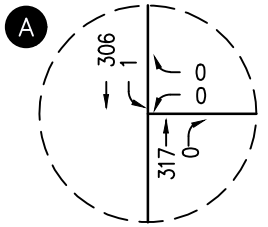


WALNUT AVE @
HILL ST

CHERRY AVE @
HILL ST

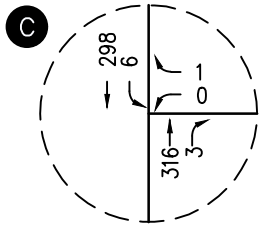


WALNUT AVE @
E. 20TH ST/ALAMITOS AVE



WALNUT AVE @
PROJECT DWY NO. 1

WALNUT AVE @
PROJECT DWY NO. 2



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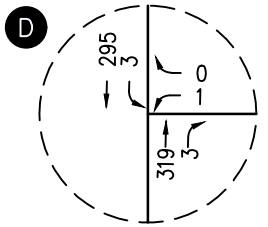

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PROJECT DWY NO. 4

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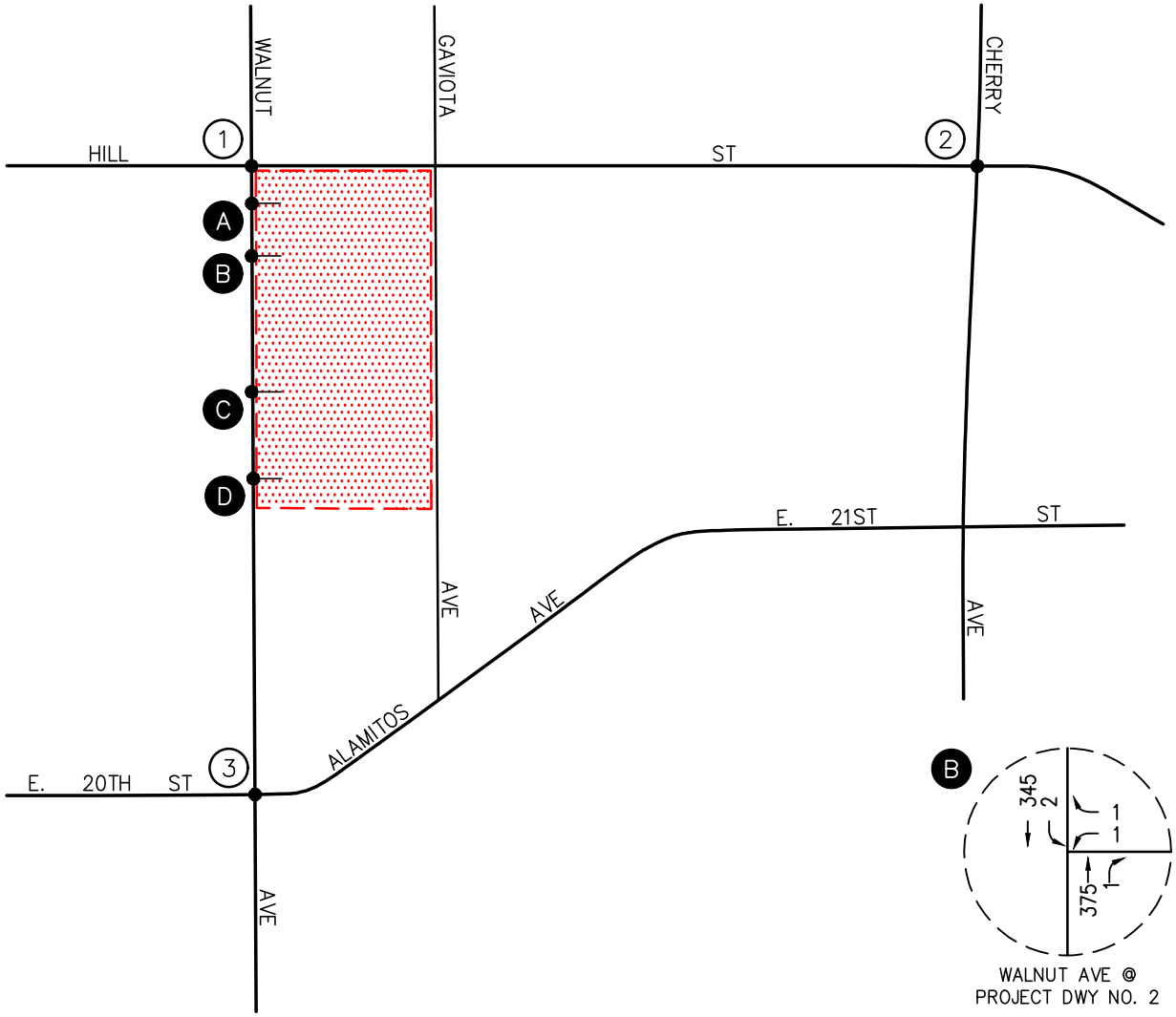
N NO SCALE

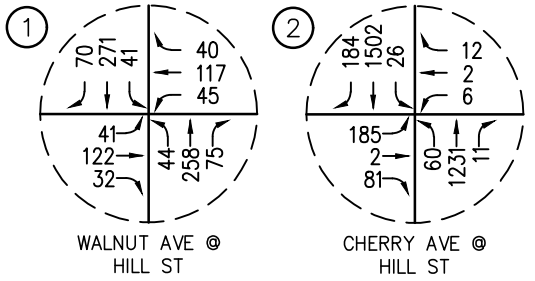
KEY
(#) = STUDY INTERSECTION
= PROJECT SITE

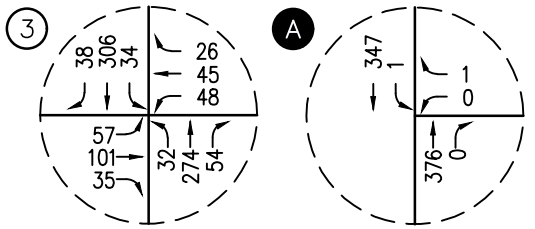
FIGURE 9A

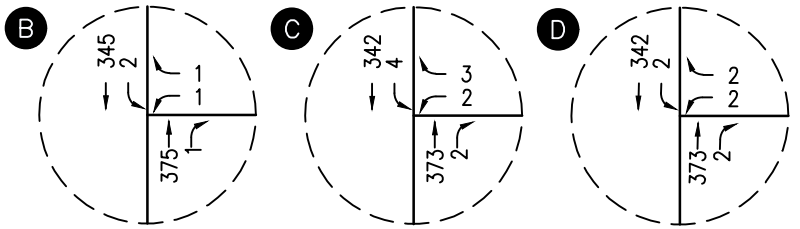
GENERAL PLAN BUILDOUT (YEAR 2040) AM PEAK HOUR TRAFFIC VOLUMES

AMERICAN UNIVERSITY OF HEALTH SCIENCES, SIGNAL HILL









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KEY

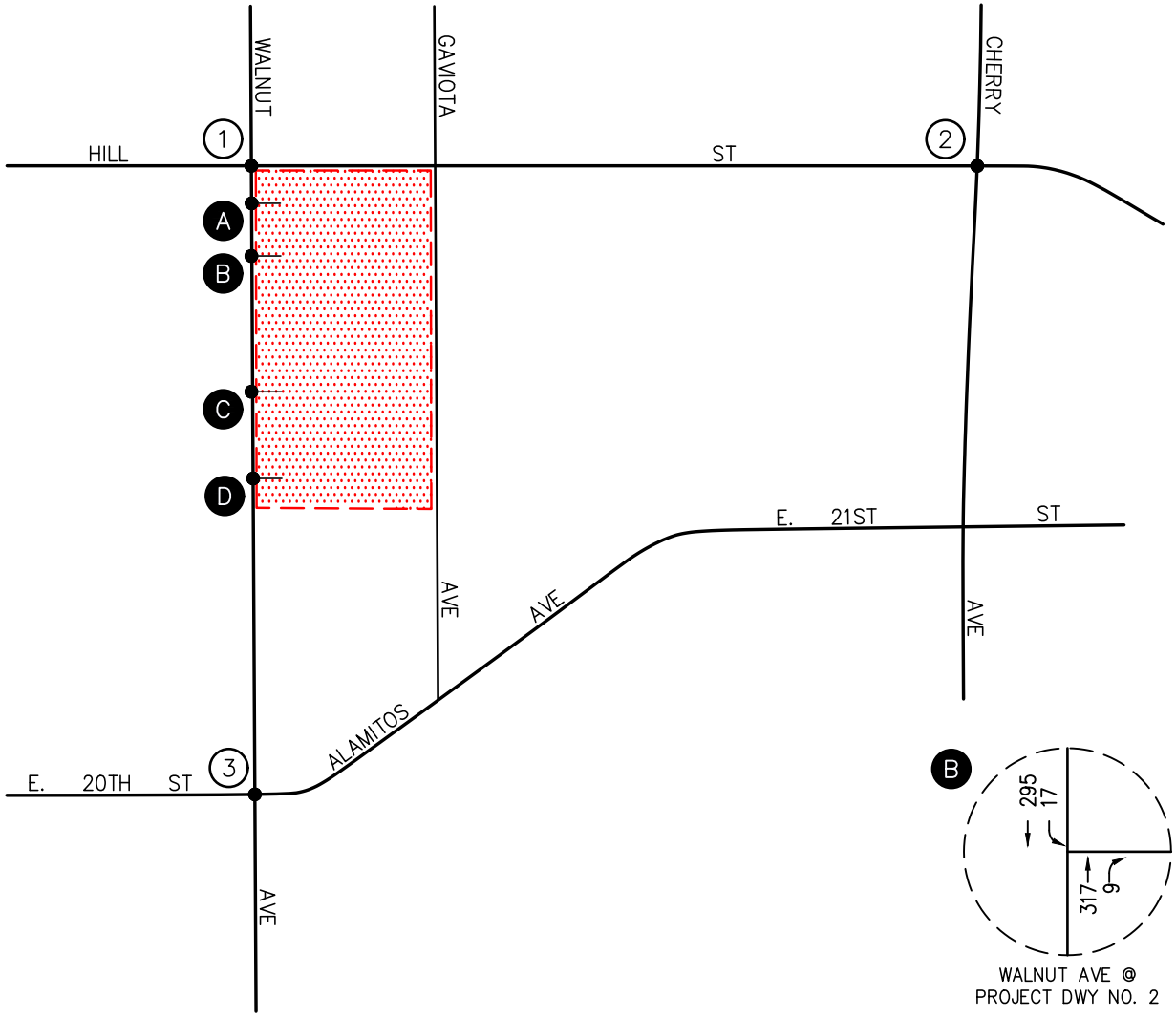
(#) = STUDY INTERSECTION

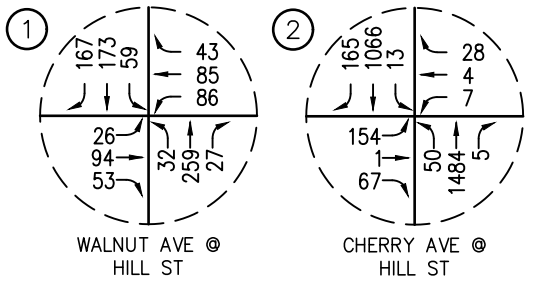
= PROJECT SITE

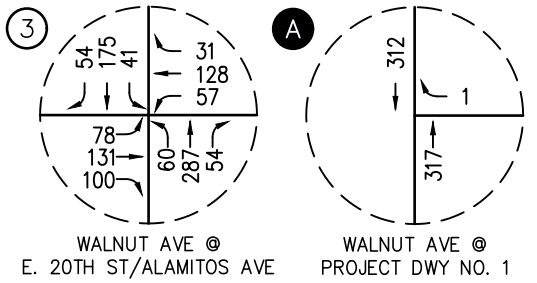
FIGURE 9B

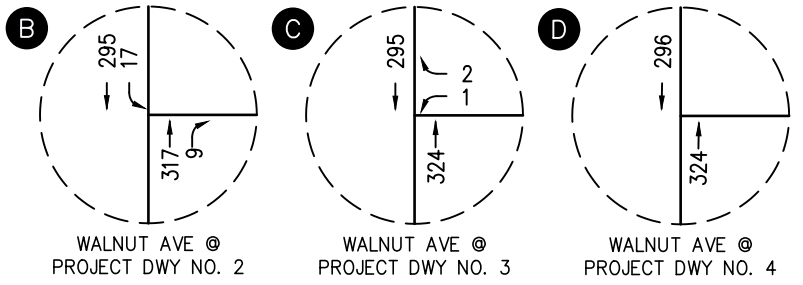
GENERAL PLAN BUILDOUT (YEAR 2040) PM PEAK HOUR TRAFFIC VOLUMES

AMERICAN UNIVERSITY OF HEALTH SCIENCES, SIGNAL HILL









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KEY

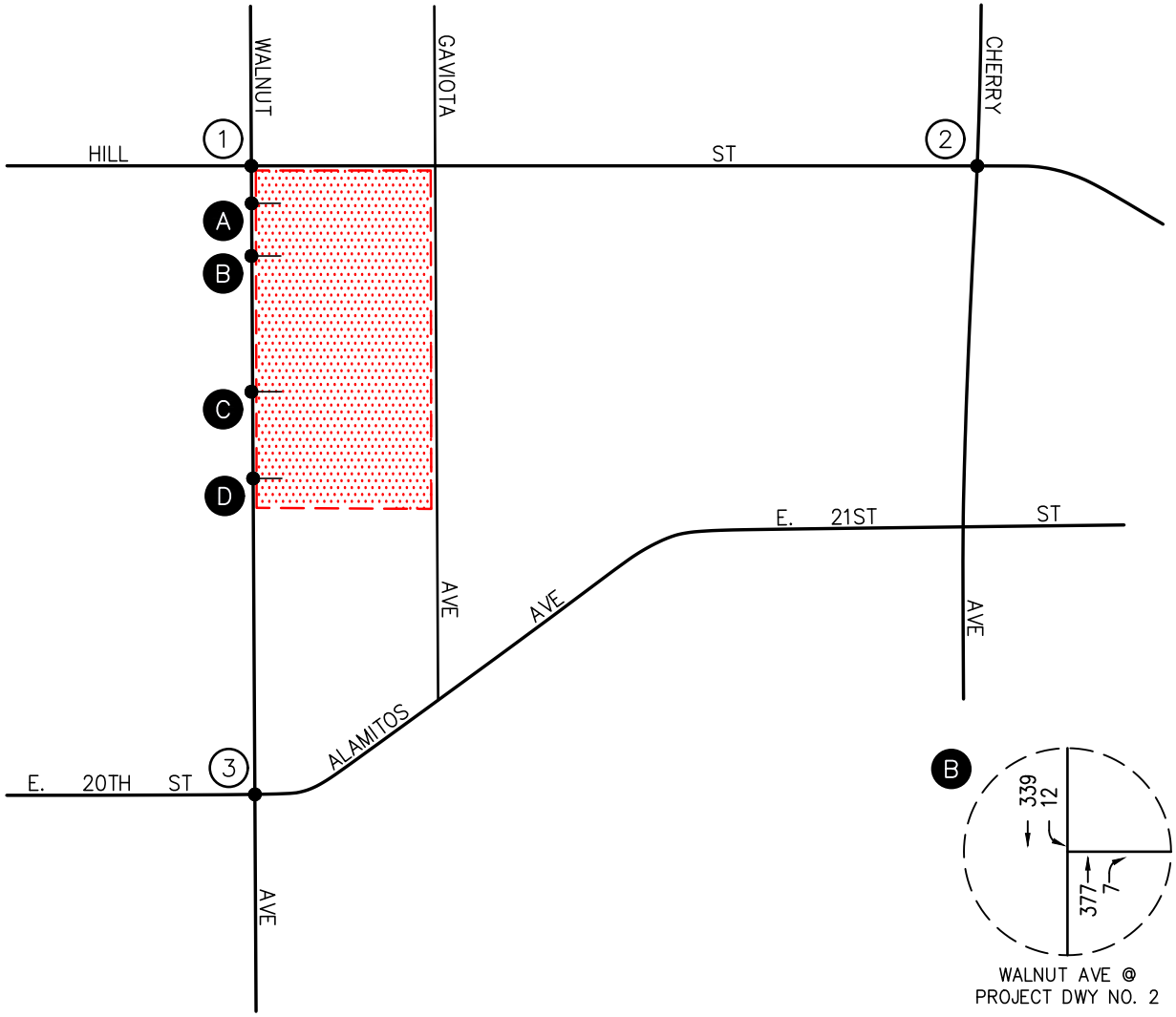
(#) = STUDY INTERSECTION

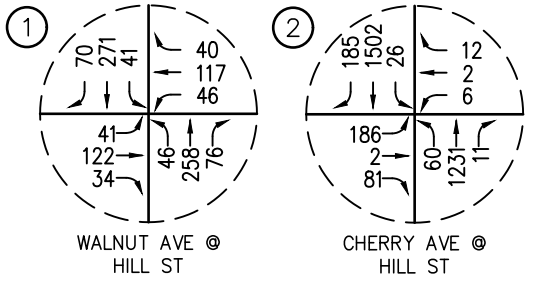
= PROJECT SITE

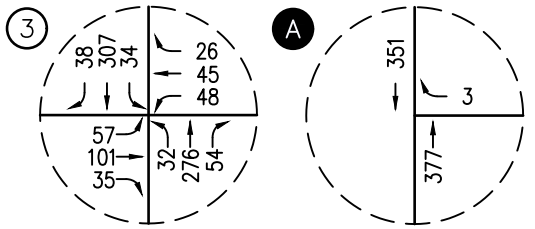
FIGURE 10A

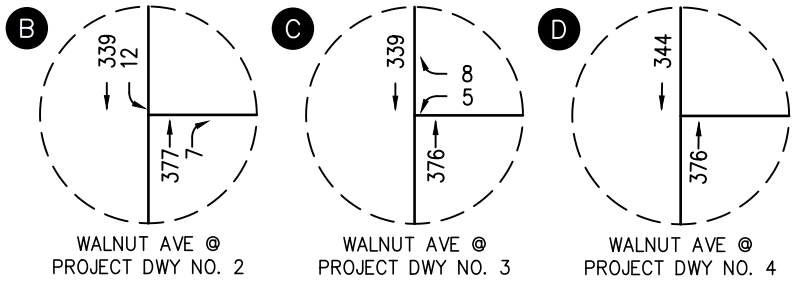
GENERAL PLAN BUILDOUT (YEAR 2040) PLUS PROJECT AM PEAK HOUR TRAFFIC VOLUMES

AMERICAN UNIVERSITY OF HEALTH SCIENCES, SIGNAL HILL









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KEY

(#) = STUDY INTERSECTION

= PROJECT SITE

FIGURE 10B

GENERAL PLAN BUILDOUT (YEAR 2040) PLUS PROJECT PM PEAK HOUR TRAFFIC VOLUMES

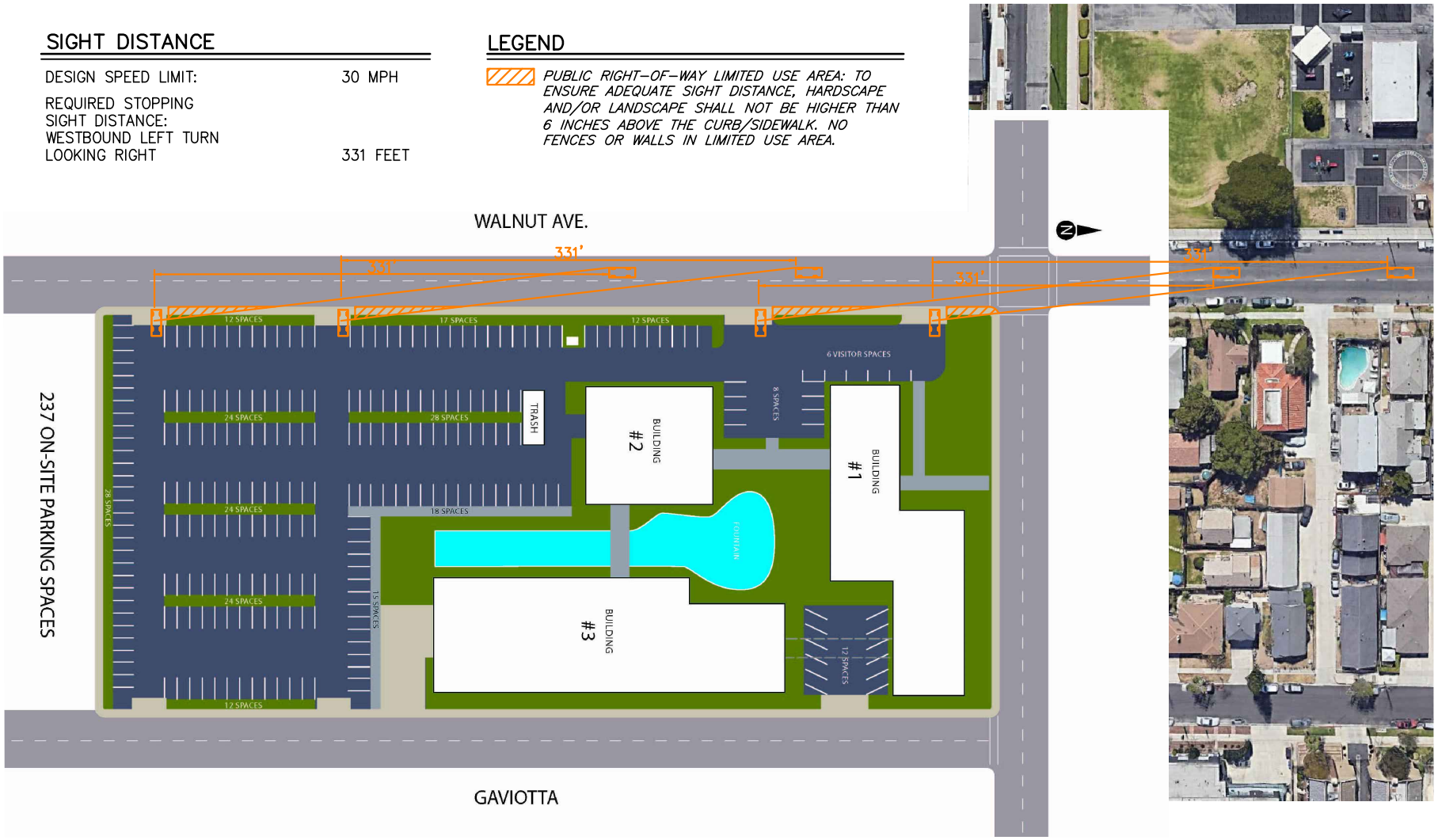
AMERICAN UNIVERSITY OF HEALTH SCIENCES, SIGNAL HILL

SIGHT DISTANCE

DESIGN SPEED LIMIT:	30 MPH
REQUIRED STOPPING SIGHT DISTANCE: WESTBOUND LEFT TURN LOOKING RIGHT	331 FEET

LEGEND

PUBLIC RIGHT-OF-WAY LIMITED USE AREA: TO ENSURE ADEQUATE SIGHT DISTANCE, HARDSCAPE AND/OR LANDSCAPE SHALL NOT BE HIGHER THAN 6 INCHES ABOVE THE CURB/SIDEWALK. NO FENCES OR WALLS IN LIMITED USE AREA.



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NO SCALE

FIGURE 11

CORNER SIGHT DISTANCE – EXITING VEHICLES LOOKING RIGHT

AMERICAN UNIVERSITY OF HEALTH SCIENCES, SIGNAL HILL

SIGHT DISTANCE

DESIGN SPEED LIMIT:	30 MPH
REQUIRED STOPPING SIGHT DISTANCE: WESTBOUND LEFT TURN LOOKING LEFT	287 FEET

LEGEND

PUBLIC RIGHT-OF-WAY LIMITED USE AREA: TO ENSURE ADEQUATE SIGHT DISTANCE, HARDSCAPE AND/OR LANDSCAPE SHALL NOT BE HIGHER THAN 6 INCHES ABOVE THE CURB/SIDEWALK. NO FENCES OR WALLS IN LIMITED USE AREA.



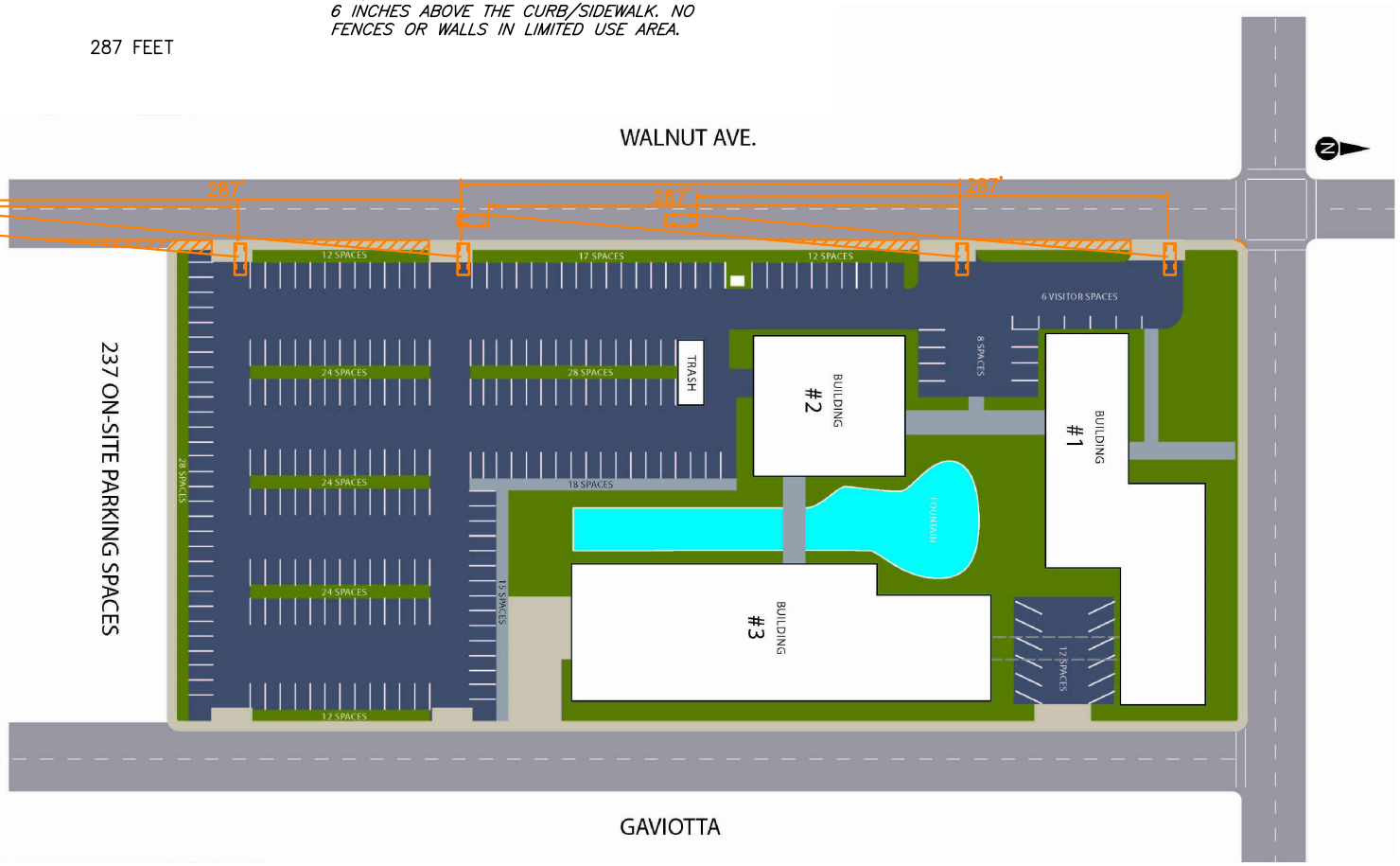

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FIGURE 12

CORNER SIGHT DISTANCE – EXITING VEHICLES LOOKING LEFT

AMERICAN UNIVERSITY OF HEALTH SCIENCES, SIGNAL HILL

TABLE 1
LEVEL OF SERVICE CRITERIA FOR SIGNALIZED INTERSECTIONS[1] (ICU METHODOLOGY)
AUHS, SIGNAL HILL

Level of Service (LOS)	Intersection Capacity Utilization Value (V/C)	Level of Service Description
A	≤ 0.600	EXCELLENT. No vehicle waits longer than one red light, and no approach phase is fully used.
B	0.601 – 0.700	VERY GOOD. An occasional approach phase is fully utilized; many drivers begin to feel somewhat restricted within groups of vehicles.
C	0.701 – 0.800	GOOD. Occasionally drivers may have to wait through more than one red light; backups may develop behind turning vehicles.
D	0.801 – 0.900	FAIR. Delays may be substantial during portions of the rush hours, but enough lower volume periods occur to permit clearing of developing lines, preventing excessive backups.
E	0.901 – 1.000	POOR. Represents the most vehicles intersection approaches can accommodate; may be long lines of waiting vehicles through several signal cycles.
F	> 1.000	FAILURE. Backups from nearby locations or on cross streets may restrict or prevent movement of vehicles out of the intersection approaches. Potentially very long delays with continuously increasing queue lengths.

[1] Source: *Transportation Research Board Circular 212 – Interim Materials on Highway Capacity*.

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TABLE 2

LEVEL OF SERVICE CRITERIA FOR SIGNALIZED INTERSECTIONS (HCM 6 METHODOLOGY)[2]

AUHS, SIGNAL HILL

Level of Service (LOS)	Control Delay Per Vehicle (seconds/vehicle)	Level of Service Description
A	≤ 10.0	This level of service occurs when progression is extremely favorable and most vehicles arrive during the green phase. Most vehicles do not stop at all. Short cycle lengths may also contribute to low delay.
B	> 10.0 and ≤ 20.0	This level generally occurs with good progression, short cycle lengths, or both. More vehicles stop than with LOS A, causing higher levels of average delay.
C	> 20.0 and ≤ 35.0	Average traffic delays. These higher delays may result from fair progression, longer cycle lengths, or both. Individual cycle failures may begin to appear at this level. The number of vehicles stopping is significant at this level, though many still pass through the intersection without stopping.
D	> 35.0 and ≤ 55.0	Long traffic delays At level D, the influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high *v/c* ratios. Many vehicles stop and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.
E	> 55.0 and ≤ 80.0	Very long traffic delays This level is considered by many agencies to be the limit of acceptable delay. These high delay values generally indicate poor progression, long cycle lengths and high *v/c* ratios. Individual cycle failures are frequent occurrences.
F	≥ 80.0	Severe congestion This level, considered to be unacceptable to most drivers, often occurs with over saturation, that is, when arrival flow rates exceed the capacity of the intersection. It may also occur at high *v/c* ratios below 1.0 with many individual cycle failures. Poor progression and long cycle lengths may also be major contributing factors to such delay levels.

[2] Source: *Highway Capacity Manual 6*, Chapter 19: Signalized Intersections.

TABLE 3
LEVEL OF SERVICE CRITERIA FOR UNSIGNALIZED INTERSECTIONS (HCM 6 METHODOLOGY)[3,4]
AUHS, SIGNAL HILL

Level of Service (LOS)	Highway Capacity Manual Delay Value (sec/veh)	Level of Service Description
A	≤ 10.0	Little or no delay
B	> 10.0 and ≤ 15.0	Short traffic delays
C	> 15.0 and ≤ 25.0	Average traffic delays
D	> 25.0 and ≤ 35.0	Long traffic delays
E	> 35.0 and ≤ 50.0	Very long traffic delays
F	> 50.0	Severe congestion

[3] Source: *Highway Capacity Manual 6*, Chapter 20: Two-Way Stop-Controlled Intersections. The LOS criteria apply to each lane on a given approach and to each approach on the minor street. LOS is not calculated for major-street approaches or for the intersection as a whole.

[4] Source: *Highway Capacity Manual 6*, Chapter 21: All-Way Stop-Controlled Intersections. For approaches and intersection-wide assessment, LOS is defined solely by control delay.

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TABLE 4
PROJECT TRIP GENERATION
AUHS, SIGNAL HILL

Description	Daily	AM Peak Hour			PM Peak Hour		
		Enter	Exit	Total	Enter	Exit	Total
Trip Generation Factors:							
▪ ITE 540: Junior Community College (TE/Student)[5]	1.15	81%	19%	0.11	56%	4%	0.11
▪ Empirical Rate for OCC, Costa Mesa (TE/Student) [a]	1.271	0.107	0.018	0.125	0.076	0.065	0.141
ITE Project Trip Generation Forecast:							
▪ Future Enrollment (231 Students)	266	20	5	25	14	11	25
▪ Existing Enrollment (180 Students)	207	16	4	20	11	9	20
Net Increase in Trips:	**59**	**4**	**1**	**5**	**3**	**2**	**5**
Empirical Project Trip Generation Forecast:							
▪ Future Enrollment (231 Students)	294	25	4	29	18	15	33
▪ Existing Enrollment (180 Students)	229	19	3	22	14	12	26
Net Increase in Trips:	**65**	**6**	**1**	**7**	**4**	**3**	**7**

Notes:
- TE/Student = Trip end per student

[a] *Orange Coast College Vision 2020 Facilities Master Plan Traffic Impact Study*, prepared by LLG Engineers in June 2015

[5] Source*: Trip Generation, 10th Edition*, Institute of Transportation Engineers, (ITE) [Washington, D.C. (2017)].

TABLE 5
PROJECT-RELATED ADDED PEAK HOUR TRAFFIC VOLUMES
AUHS, SIGNAL HILL

Key Intersection	Jurisdiction	Time Period	Added Peak Hour Project Trips	Exceed City of Signal Hill "40 Peak Hour Trip" Threshold (Yes/No)	Exceed City of Long Beach "50 Peak Hour Trip" Threshold (Yes/No)
1. Walnut Avenue at Hill Street	Signal Hill	AM	6	No	--
		PM	6	No	--
2. Cherry Avenue at Hill Street	Signal Hill	AM	2	No	--
		PM	2	No	--
3. Walnut Avenue at E. 20th Street/Alamitos Avenue	Signal Hill/ Long Beach	AM	2	No	No
		PM	3	No	No

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TABLE 6
EXISTING PLUS PROJECT PEAK HOUR INTERSECTION CAPACITY ANALYSIS
AUHS, SIGNAL HILL

Key Intersection	Jurisdiction	Time Period	(1) Existing Traffic Conditions				(2) Existing Plus Project Traffic Conditions				(3) Significant Impact				(4) Existing Plus Project Traffic Conditions with Improvements			
			ICU	LOS	Delay (s/v)	LOS	ICU	LOS	Delay (s/v)	LOS	ICU Increase	Yes/No	Delay Increase (s/v)	Yes/No	ICU	LOS	Delay (s/v)	LOS
1. Walnut Avenue at Hill Street	Signal Hill	AM	--	--	15.8 s/v	C	--	--	16.0 s/v	C	--	--	0.2 s/v	No	--	--	--	--
		PM	--	--	14.5 s/v	B	--	--	14.6 s/v	B	--	--	0.1 s/v	No	--	--	--	--
2. Cherry Avenue at Hill Street	Signal Hill	AM	0.622	B	--	--	0.622	B	--	--	0.000	No	--	--	--	--	--	--
		PM	0.678	B	--	--	0.679	B	--	--	0.001	No	--	--	--	--	--	--
3. Walnut Avenue at E. 20th Street/Alamitos Avenue	Signal Hill/ Long Beach	AM	0.601	B	27.8 s/v	C	0.603	B	27.8 s/v	C	0.002	No	0.0 s/v	No	--	--	--	--
		PM	0.533	A	20.4 s/v	C	0.534	A	20.4 s/v	C	0.001	No	0.0 s/v	No	--	--	--	--

Notes:

- s/v = seconds per vehicle (delay)

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TABLE 7
YEAR 2040 BUILDOUT PLUS PROJECT PEAK HOUR INTERSECTION CAPACITY ANALYSIS
AUHS, SIGNAL HILL

Key Intersection	Jurisdiction	Time Period	(1) Existing Traffic Conditions				(2) Year 2040 Buildout Traffic Conditions				(3) Year 2040 Buildout Plus Project Traffic Conditions				(4) Significant Impact				(5) Year 2040 Buildout Plus Project Traffic Conditions with Improvements			
			ICU	LOS	Delay (s/v)	LOS	ICU	LOS	Delay (s/v)	LOS	ICU	LOS	Delay (s/v)	LOS	ICU Increase	Yes/No	Delay Increase (s/v)	Yes/No	ICU	LOS	Delay (s/v)	LOS
1. Walnut Avenue at Hill Street	Signal Hill	AM	--	--	15.8 s/v	C	--	--	24.4 s/v	C	--	--	25.0 s/v	C	--	--	0.6 s/v	No	--	--	--	--
		PM	--	--	14.5 s/v	B	--	--	20.1 s/v	C	--	--	20.4 s/v	C	--	--	0.3 s/v	No	--	--	--	--
2. Cherry Avenue at Hill Street	Signal Hill	AM	0.622	B	--	--	0.715	C	--	--	0.715	C	--	--	0.000	No	--	--	--	--	--	--
		PM	0.678	B	--	--	0.778	C	--	--	0.779	C	--	--	0.001	No	--	--	--	--	--	--
3. Walnut Avenue at E. 20th Street/Alamitos Avenue	Signal Hill/ Long Beach	AM	0.601	B	27.8 s/v	C	0.666	B	31.7 s/v	C	0.668	B	31.8 s/v	C	0.002	No	0.1 s/v	No	--	--	--	--
		PM	0.533	A	20.4 s/v	C	0.586	A	21.5 s/v	C	0.586	A	21.5 s/v	C	0.000	No	0.0 s/v	No	--	--	--	--

Notes:

- s/v = seconds per vehicle (delay)

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TABLE 8
EXISTING PLUS PROJECT PEAK HOUR INTERSECTION QUEUING ANALYSIS[6]
AUHS, SIGNAL HILL

Key Intersection	Storage Provided (feet)	(1) Existing (Year 2021) Traffic Conditions				(2) Existing (Year 2021) Plus Project Traffic Conditions			
		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
		Max. Queue/ Min. Storage Required	Adequate Storage (Yes/No)	Max. Queue/ Min. Storage Required	Adequate Storage (Yes/No)	Max. Queue/ Min. Storage Required	Adequate Storage (Yes/No)	Max. Queue/ Min. Storage Required	Adequate Storage (Yes/No)
1. Walnut Avenue at Hill Street									
Westbound Left/Through/Right	280’	60’	Yes	37’	Yes	62’	Yes	37’	Yes
2. Cherry Avenue at Hill Street									
Northbound Left-Turn	200’	48’	Yes	57’	Yes	48’	Yes	57’	Yes
Southbound Left-Turn	190’	25’	Yes	25’	Yes	25’	Yes	25’	Yes
Eastbound Left/Through/Right	270’	198’	Yes	231’	Yes	198’	Yes	231’	Yes
Westbound Left/Through/Right	90’	29’	Yes	25’	Yes	29’	Yes	25’	Yes
3. Walnut Avenue at E. 20th Street/Alamitos Avenue									
Northbound Left-Turn	60’	52’	Yes	25’	Yes	52’	Yes	25’	Yes
Southbound Left-Turn	60’	40’	Yes	25’	Yes	40’	Yes	25’	Yes
Eastbound Left/Through/Right	400’	311’	Yes	171’	Yes	311’	Yes	171’	Yes
Westbound Left/Through/Right	330’	206’	Yes	98’	Yes	206’	Yes	98’	Yes

6 Queues are based on HCM 6 95th Percentile methodology.

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TABLE 9
YEAR 2040 BUILDOUT PLUS PROJECT PEAK HOUR INTERSECTION QUEUING ANALYSIS[7]
AUHS, SIGNAL HILL

Key Intersection	Storage Provided (feet)	(1) Year 2040 Buildout Traffic Conditions				(2) Year 2040 Buildout Plus Project Traffic Conditions			
		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
		Max. Queue/ Min. Storage Required	Adequate Storage (Yes/No)	Max. Queue/ Min. Storage Required	Adequate Storage (Yes/No)	Max. Queue/ Min. Storage Required	Adequate Storage (Yes/No)	Max. Queue/ Min. Storage Required	Adequate Storage (Yes/No)
1. Walnut Avenue at Hill Street									
Westbound Left/Through/Right	280’	94’	Yes	55’	Yes	97’	Yes	56’	Yes
2. Cherry Avenue at Hill Street									
Northbound Left-Turn	200’	56’	Yes	68’	Yes	56’	Yes	68’	Yes
Southbound Left-Turn	190’	25’	Yes	31’	Yes	25’	Yes	31’	Yes
Eastbound Left/Through/Right	270’	222’	Yes	256’	Yes	222’	Yes	257’	Yes
Westbound Left/Through/Right	90’	35’	Yes	25’	Yes	35’	Yes	25’	Yes
3. Walnut Avenue at E. 20th Street/Alamitos Avenue									
Northbound Left-Turn	60’	73’	Yes [a]	25’	Yes	73’	Yes [a]	25’	Yes
Southbound Left-Turn	60’	57’	Yes	25’	Yes	57’	Yes	25’	Yes
Eastbound Left/Through/Right	400’	370’	Yes	198’	Yes	370’	Yes	198’	Yes
Westbound Left/Through/Right	330’	232’	Yes	116’	Yes	232’	Yes	116’	Yes

Notes:

[a] = The excess storage can be contained within the existing 55-foot transition (i.e. 115 feet of total storage).

7 Queues are based on HCM 6 95th Percentile methodology.

APPENDIX A

BACK UP DATA FROM SIGNAL HILL BUSINESS CENTER TRAFFIC IMPACT ANALYSIS (PREPARED BY KUNZMAN ASSOCIATES IN JULY 2019)

KUNZMAN ASSOCIATES, INC.

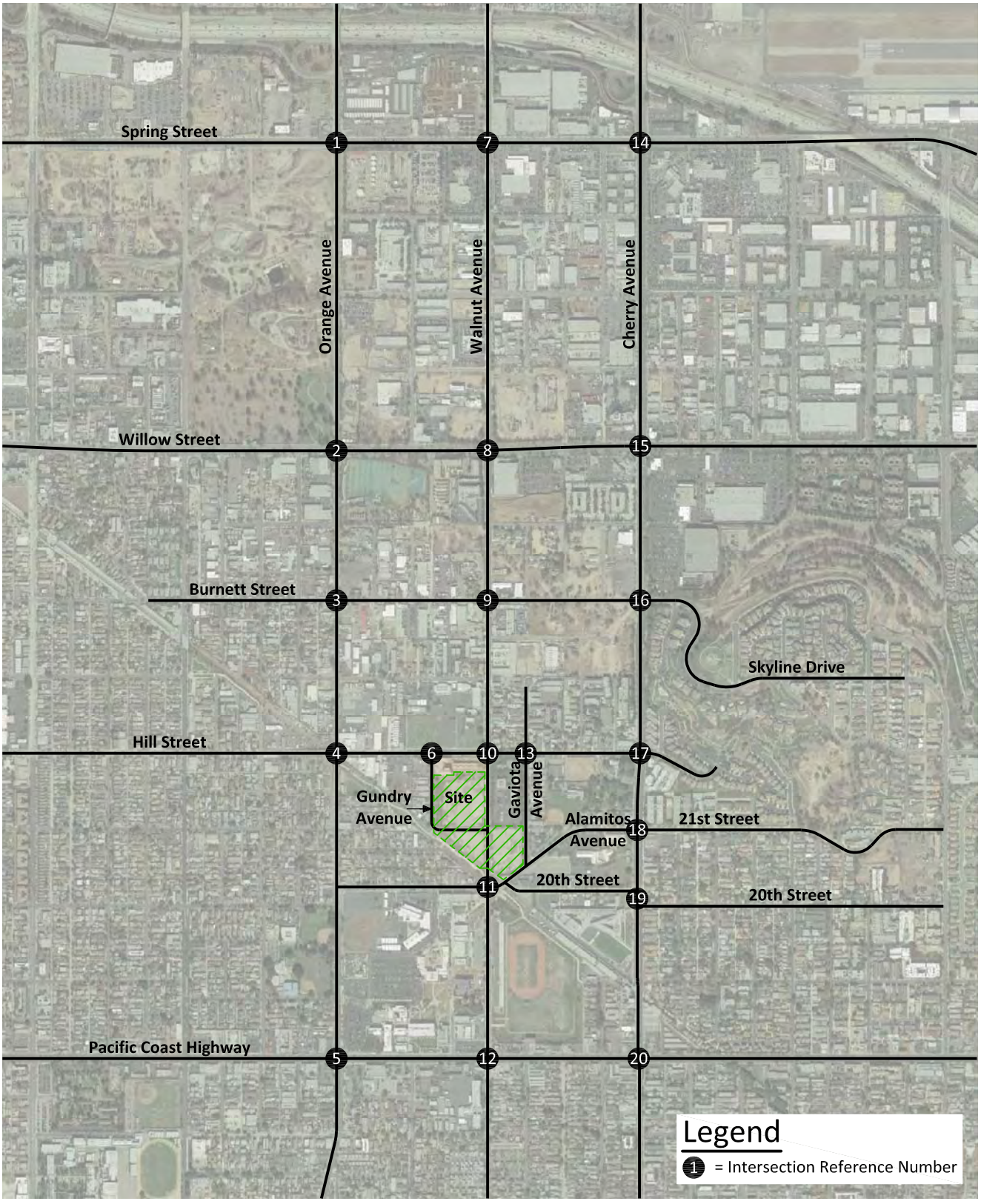
SIGNAL HILL BUSINESS CENTER

TRAFFIC IMPACT ANALYSIS

Final (July 2019)

Traffic Engineering | Transportation Planning | Parking | Noise/Vibration | Expert Witness
Air Quality | Global Climate Change | Health Risk Assessment

Figure 1
Project Location Map

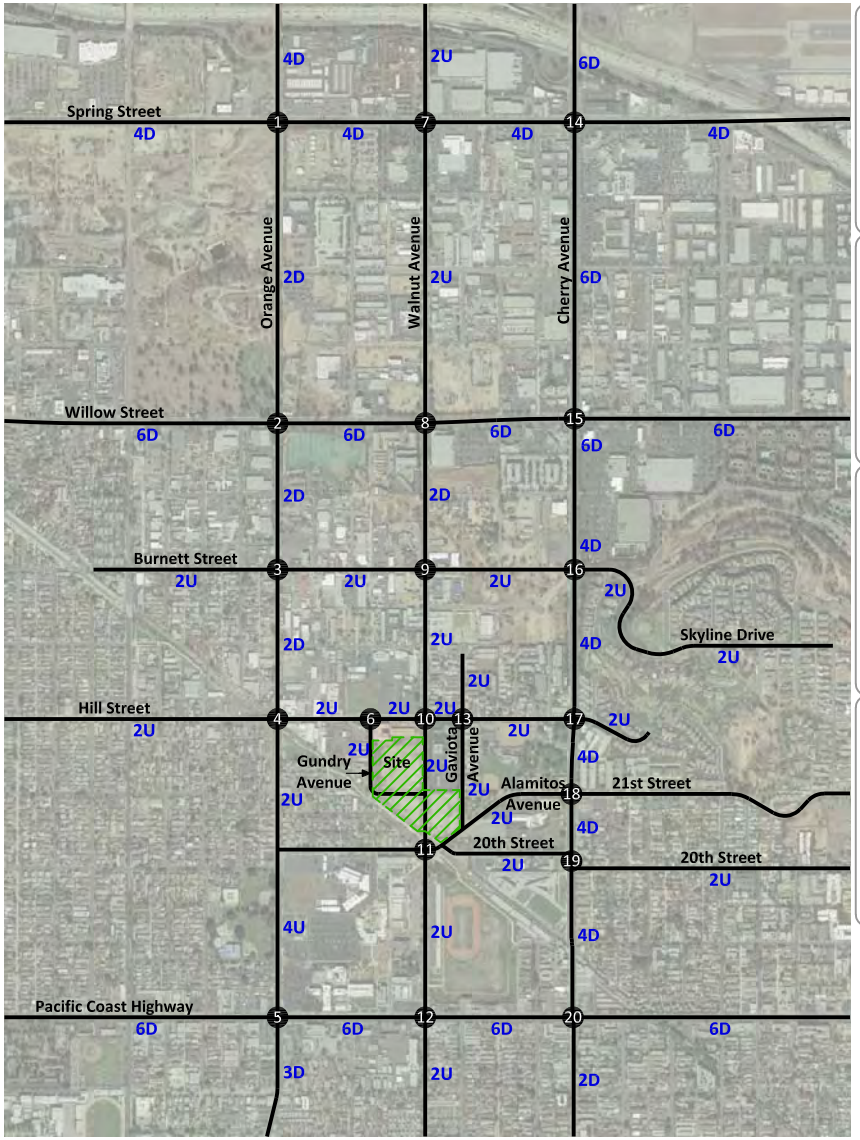


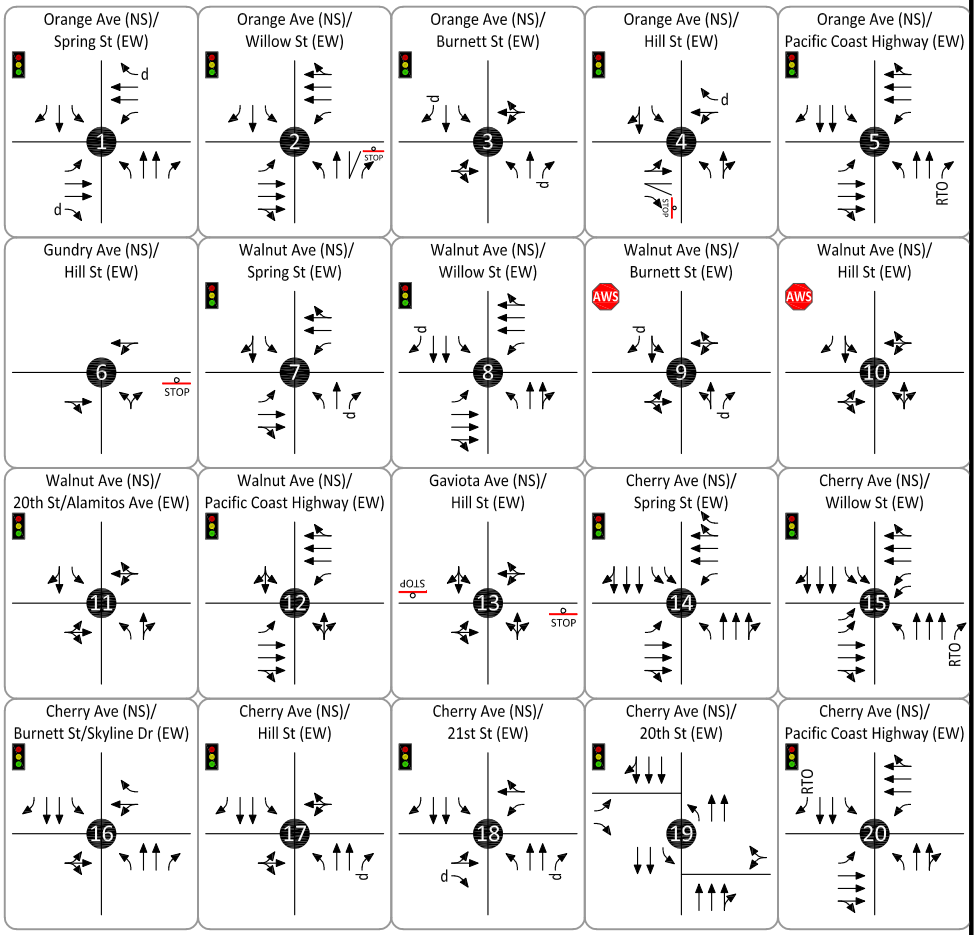
KUNZMAN ASSOCIATES, INC.

OVER 40 YEARS OF EXCELLENT SERVICE

JN 7311

Figure 3
Existing Lane Geometry and Intersection Traffic Controls





Legend

= Traffic Signal
= All Way Stop
= Stop Sign
#D = #-Lane Divided Roadway
#U = #-Lane Undivided Roadway
= Existing Lane
RTO = Right Turn Overlap
d = De Facto Right Turn Lane

KUNZMAN ASSOCIATES, INC.

OVER 40 YEARS OF EXCELLENT SERVICE

JN 7311

Figure 14
Project Trip Distribution - Passenger Cars (Outbound)

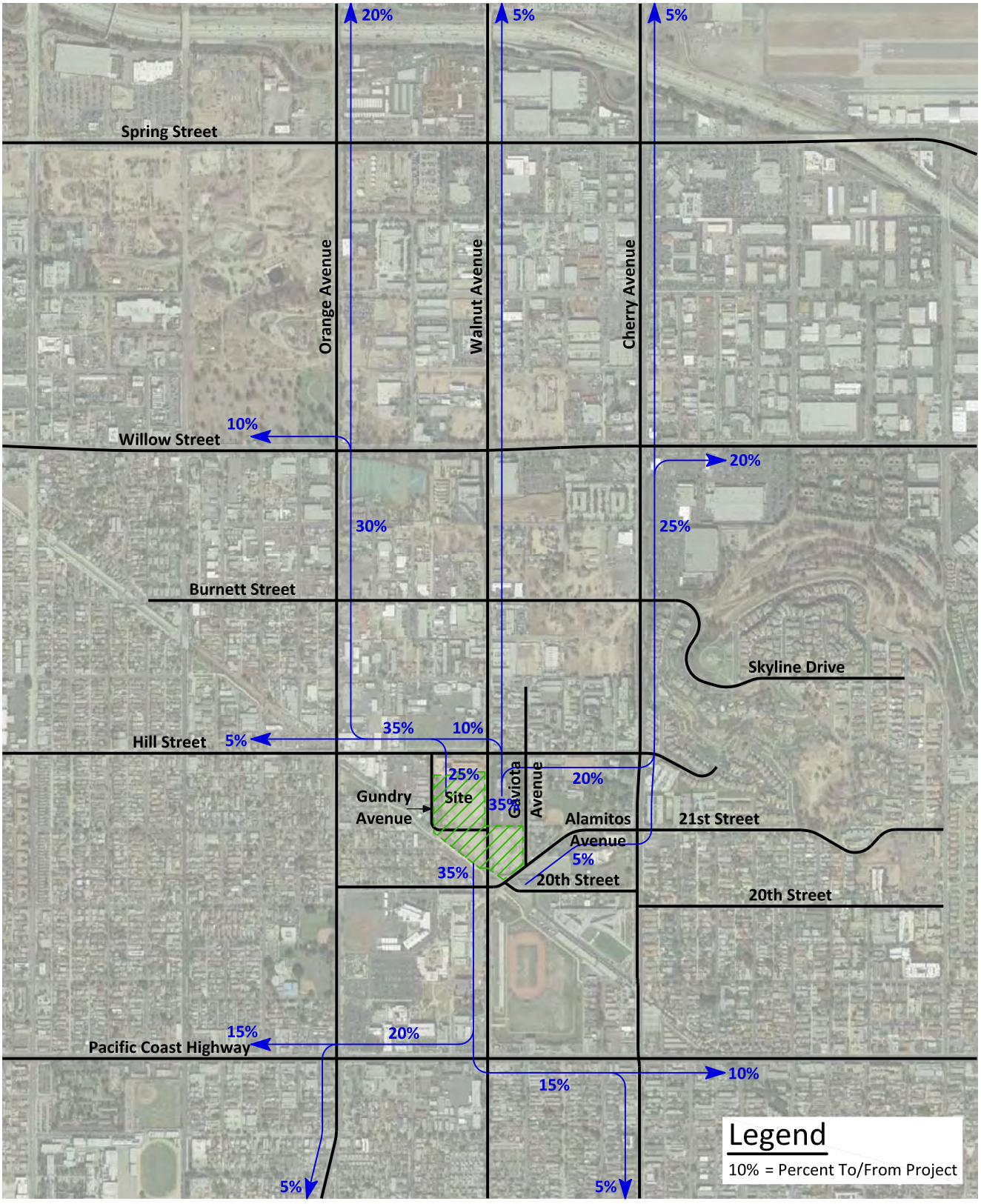


Figure 15
Project Trip Distribution - Passenger Cars (Inbound)

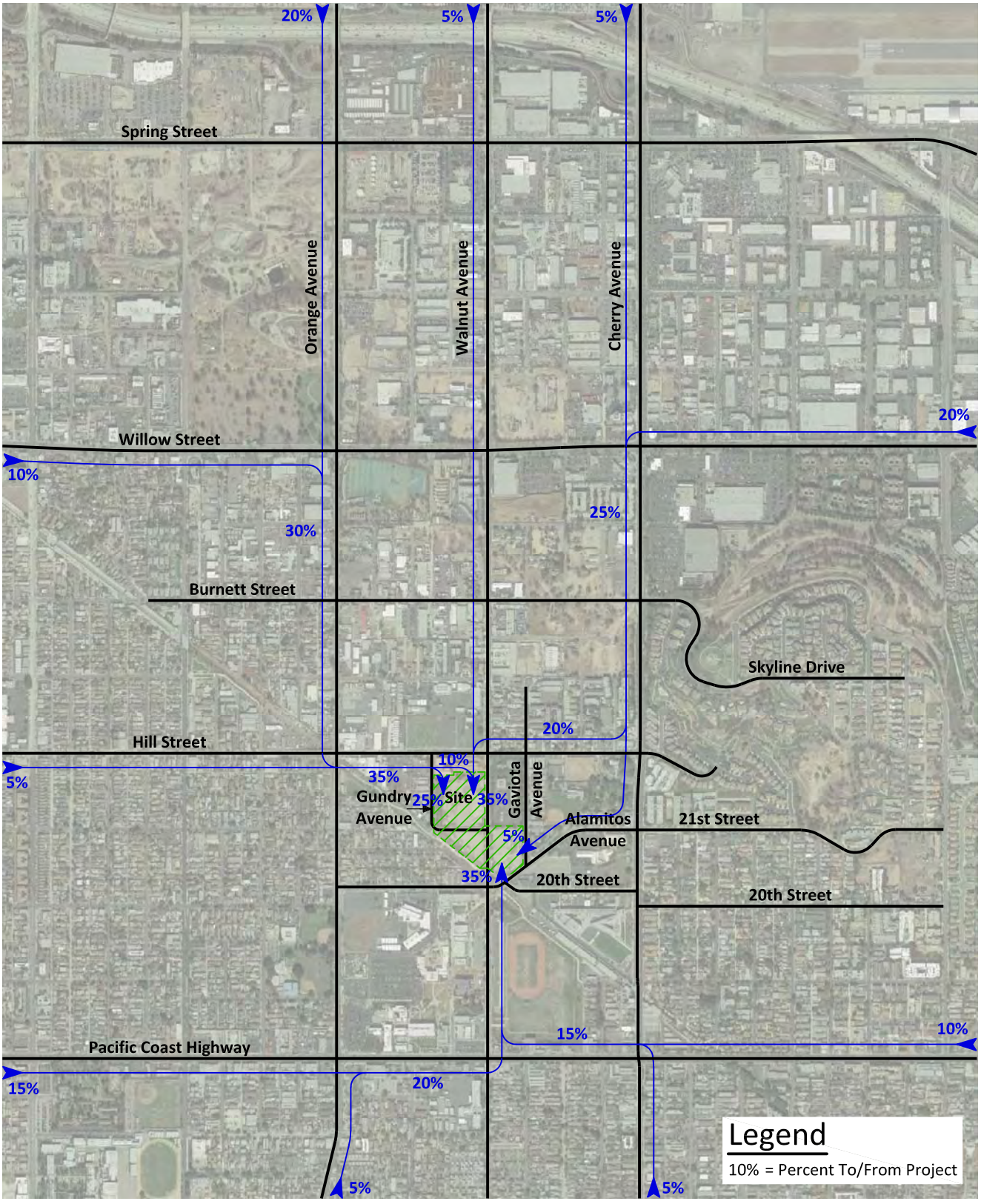
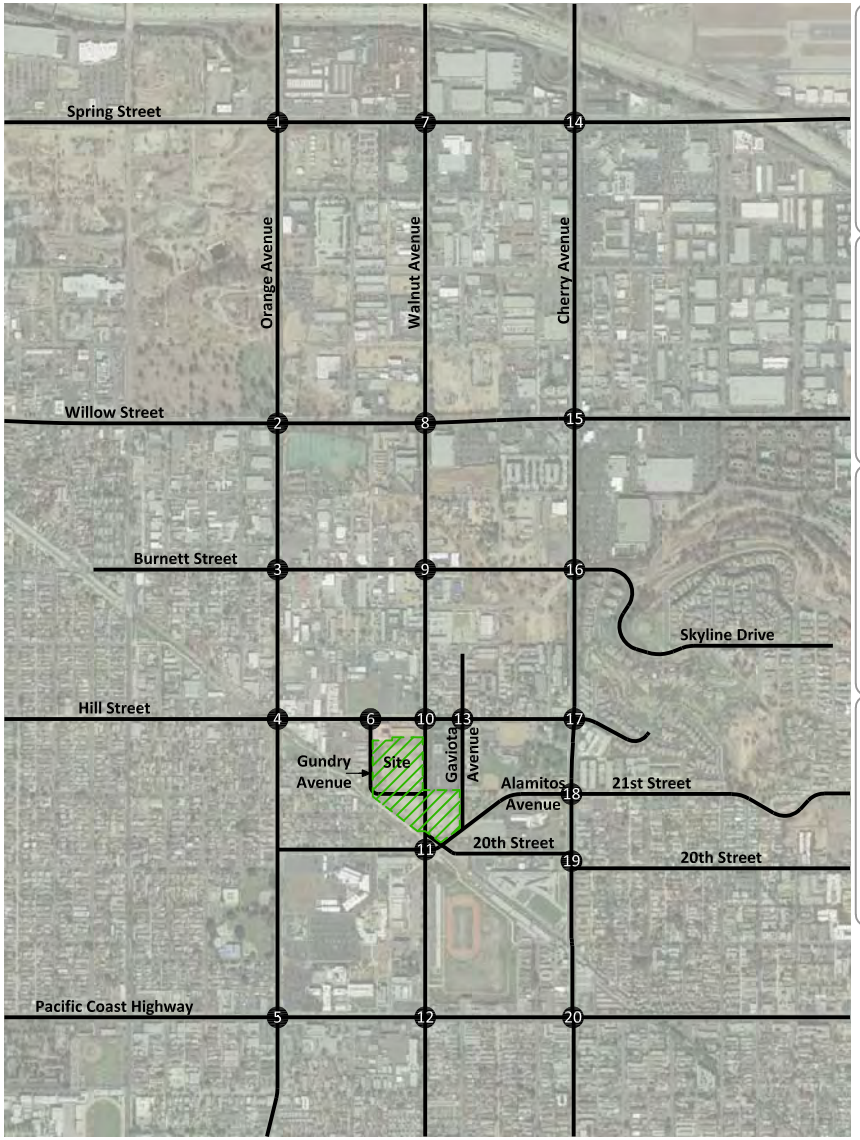
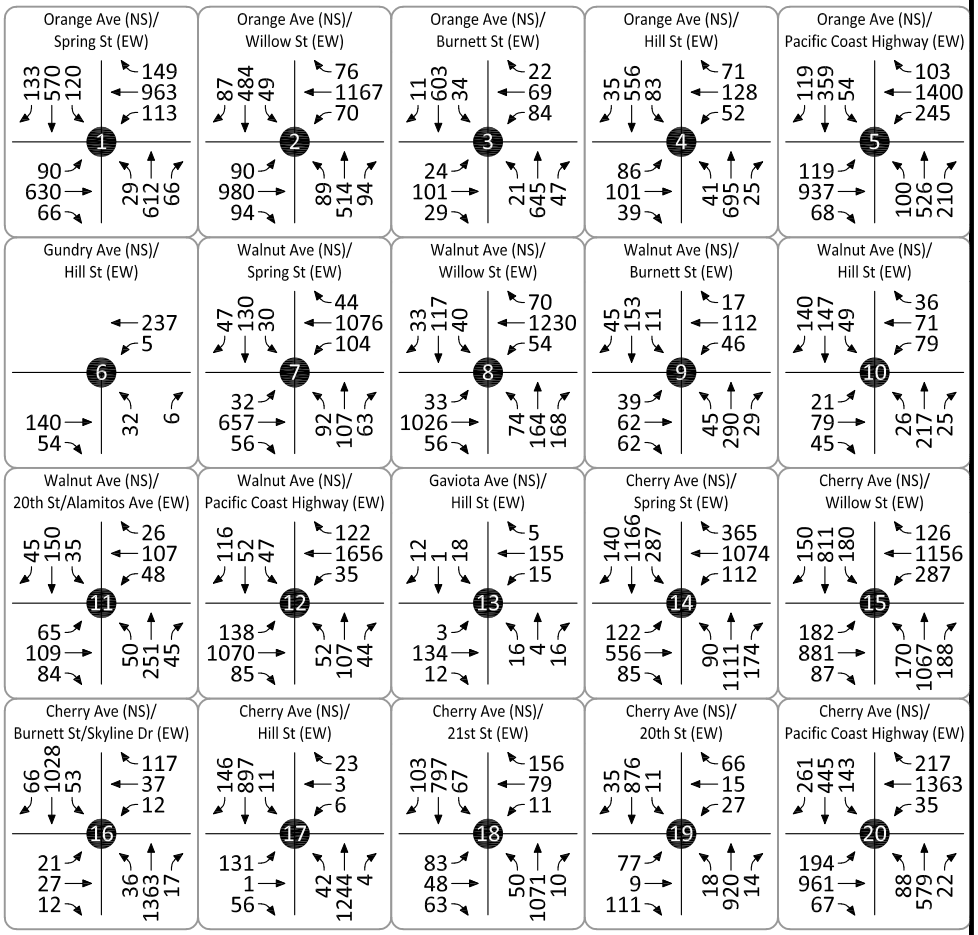


Figure 33
Opening Year (2020) With Project Morning Peak Hour Intersection Turning Movement Volumes





Legend

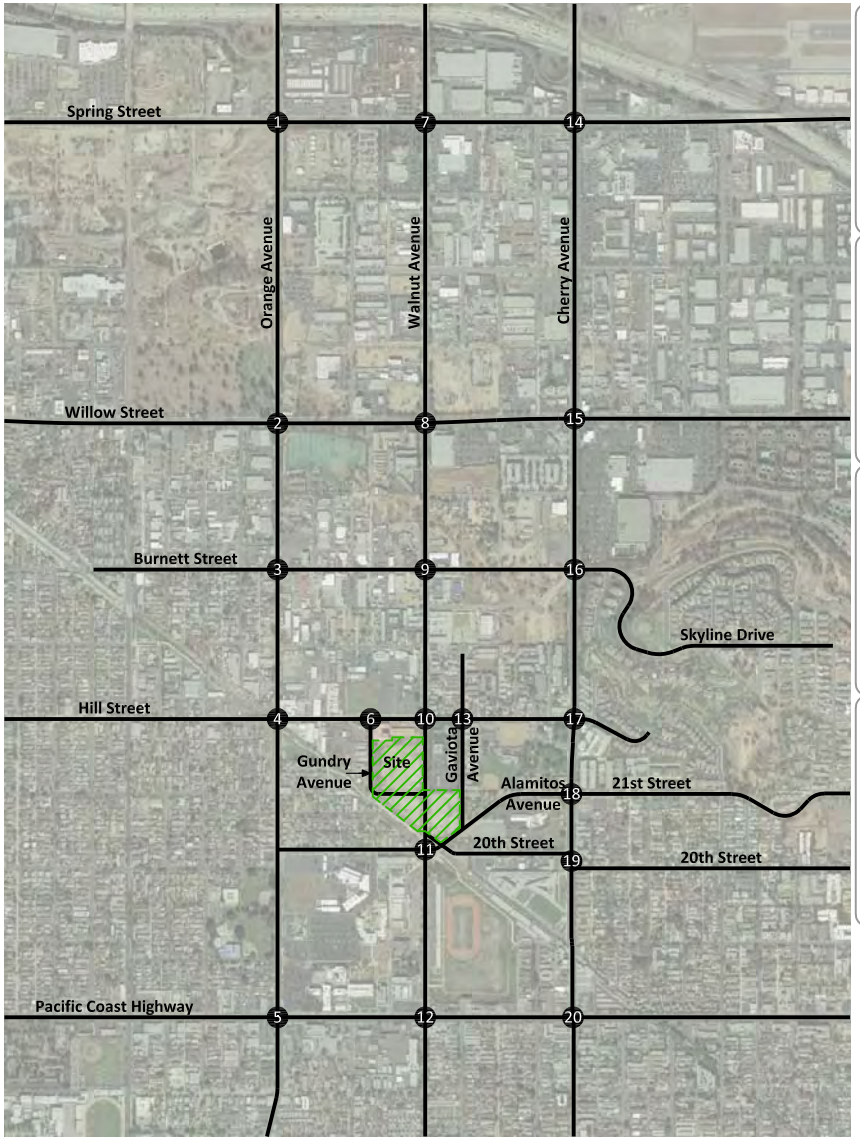
1 = Intersection Reference Number

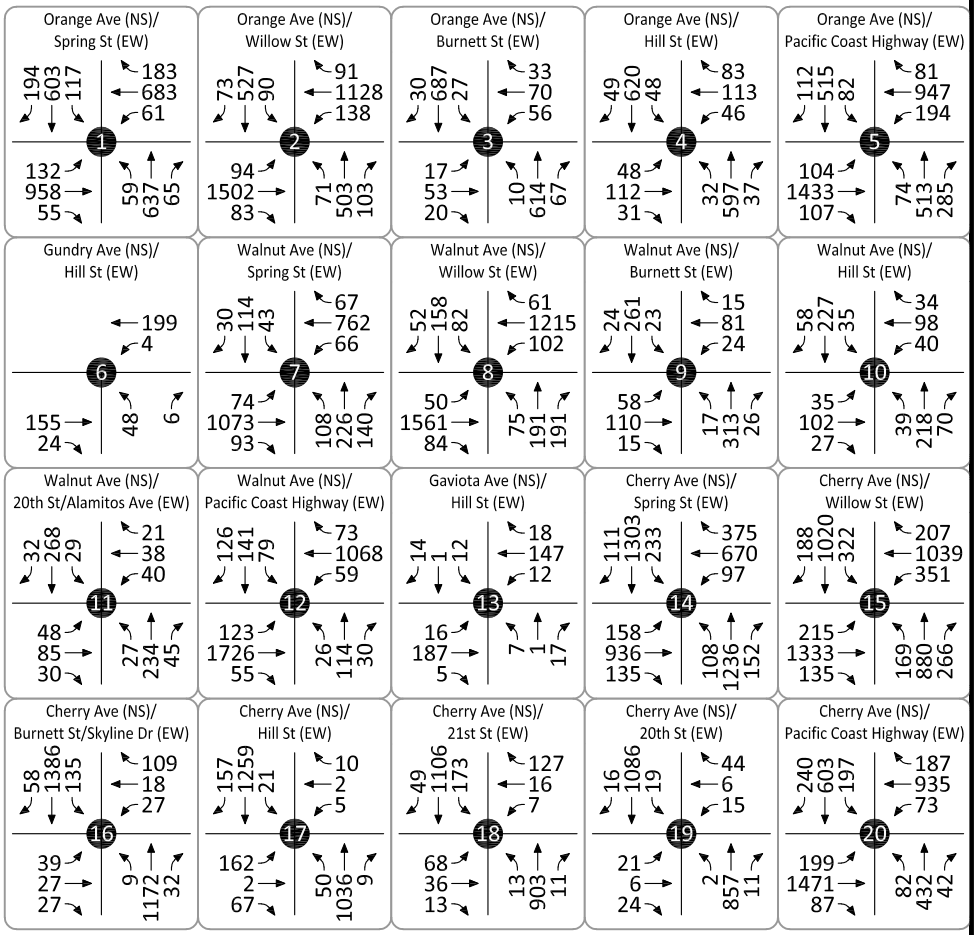
KUNZMAN ASSOCIATES, INC.

OVER 40 YEARS OF EXCELLENT SERVICE

JN 7311

Figure 34
Opening Year (2020) With Project Evening Peak Hour Intersection Turning Movement Volumes





Legend

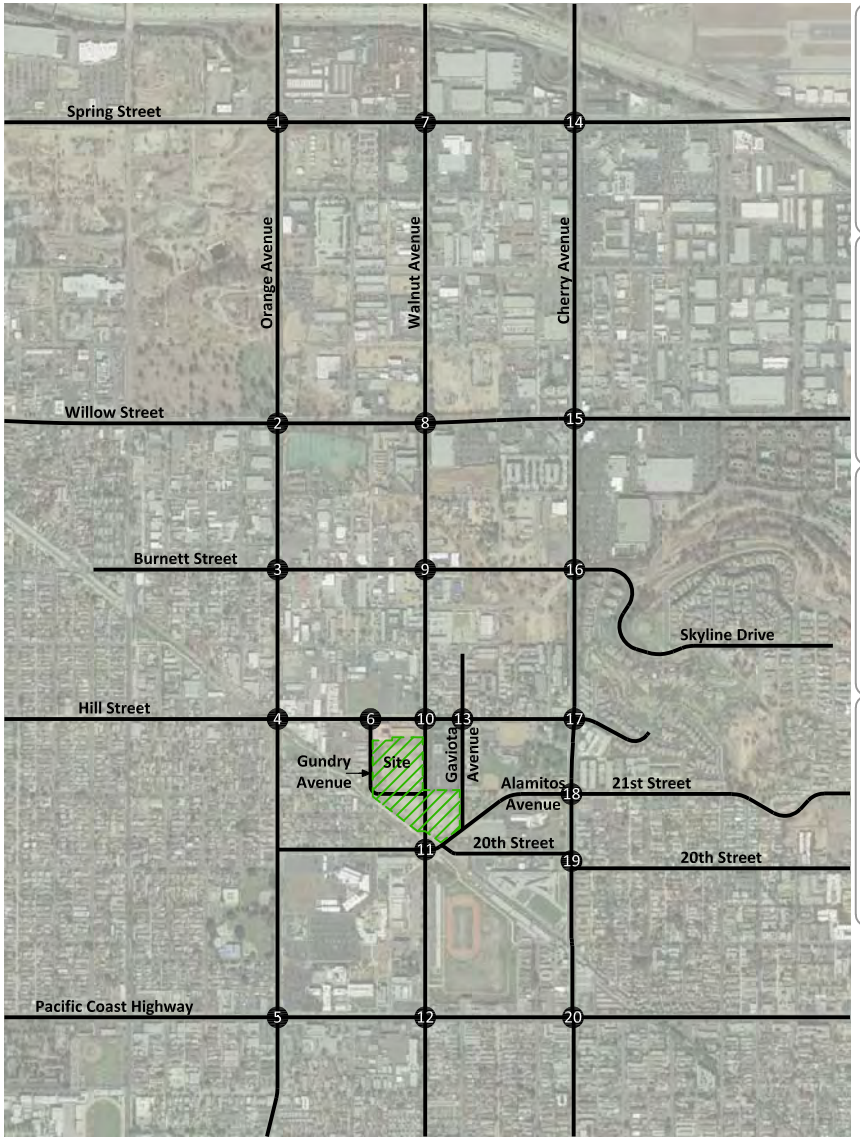
1 = Intersection Reference Number

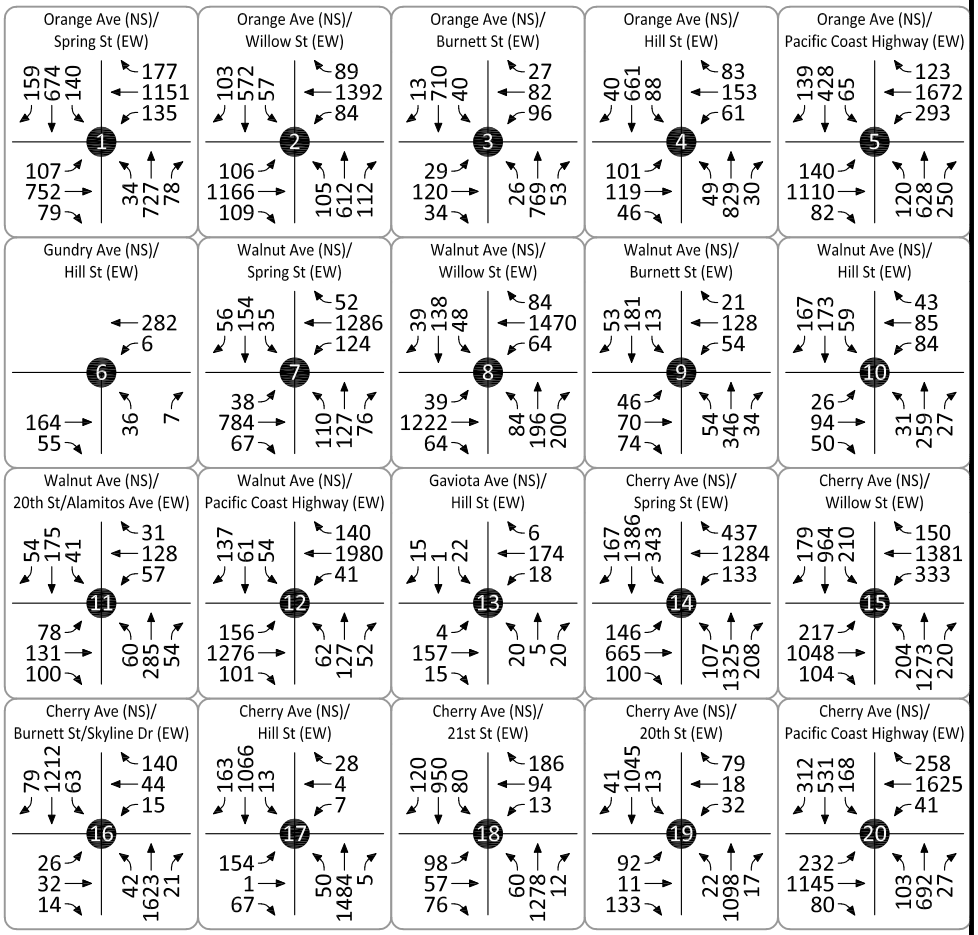
KUNZMAN ASSOCIATES, INC.

OVER 40 YEARS OF EXCELLENT SERVICE

JN 7311

Figure 37
General Plan Buildout (Year 2040) With Project
Morning Peak Hour Intersection Turning Movement Volumes





Legend

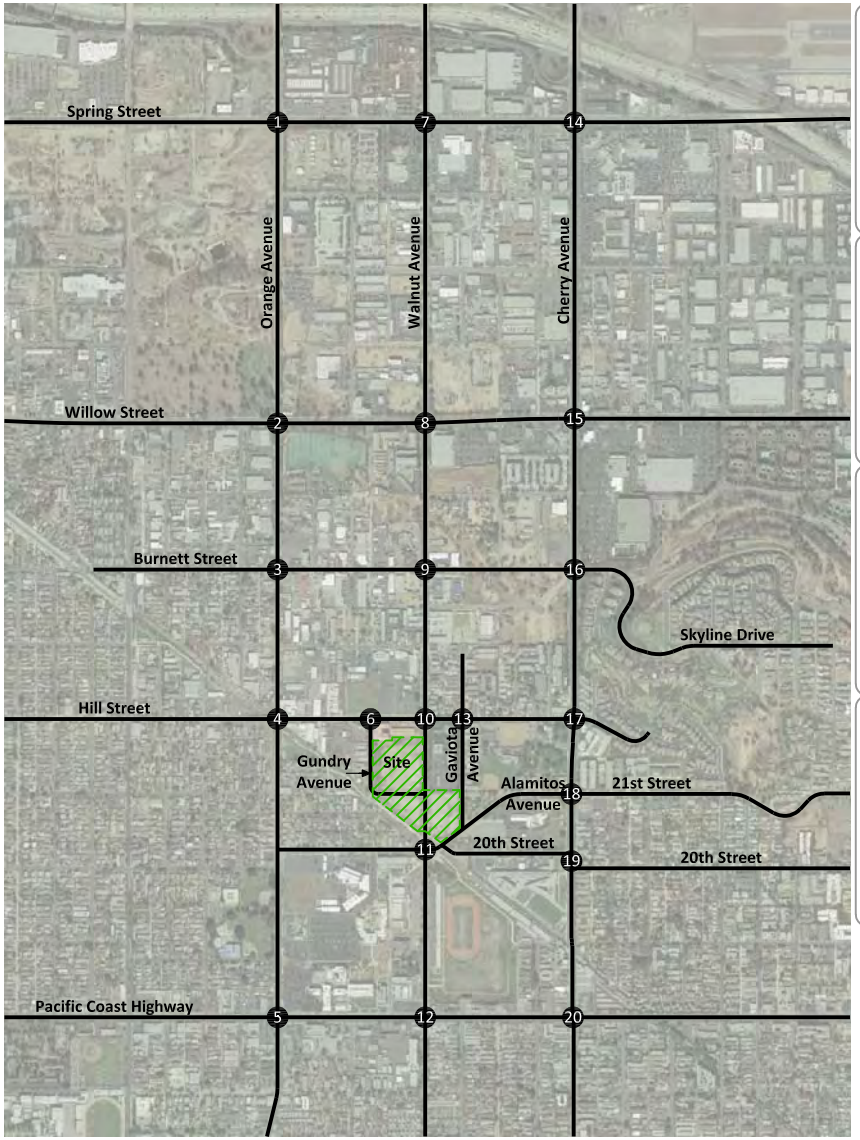
1 = Intersection Reference Number

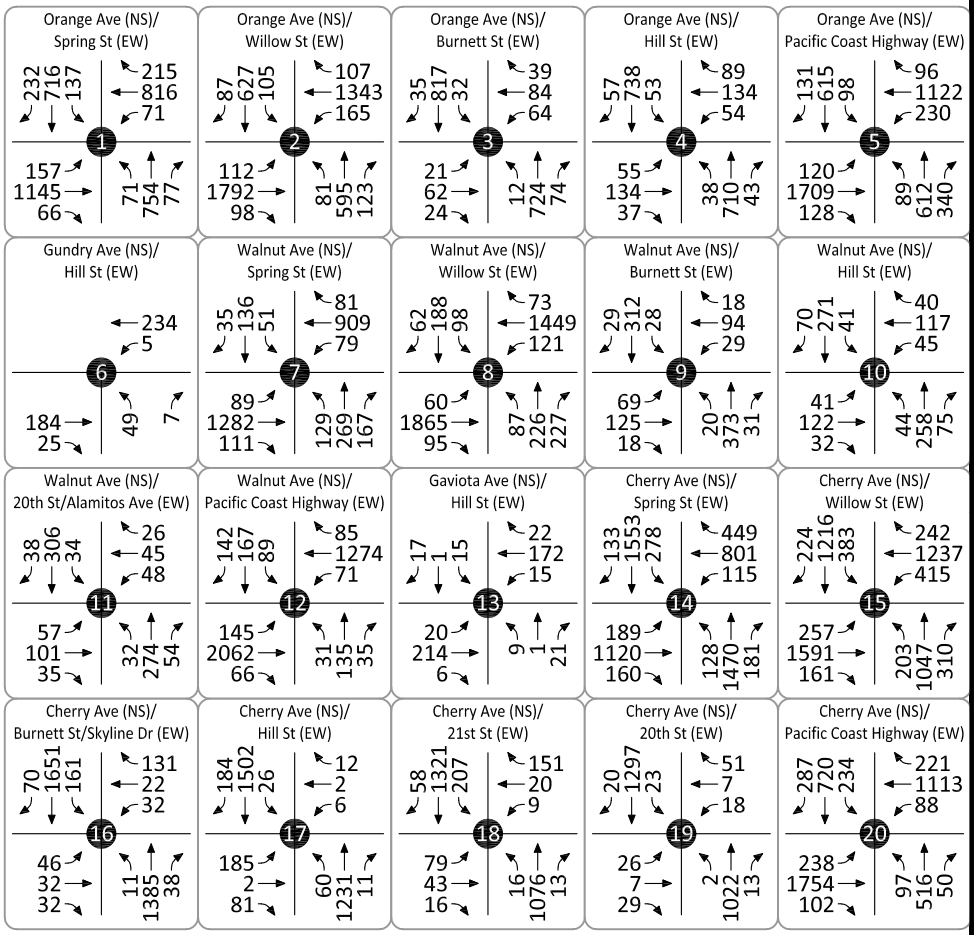
KUNZMAN ASSOCIATES, INC.

OVER 40 YEARS OF EXCELLENT SERVICE

JN 7311

Figure 38
General Plan Buildout (Year 2040) With Project
Evening Peak Hour Intersection Turning Movement Volumes





Legend

1 = Intersection Reference Number

KUNZMAN ASSOCIATES, INC.

OVER 40 YEARS OF EXCELLENT SERVICE

JN 7311

APPENDIX B

LEVEL OF SERVICE CALCULATION WORKSHEETS (ICU METHODOLOGY)

APPENDIX B-I

EXISTING (YEAR 2021) TRAFFIC CONDITIONS

Intersection Level Of Service Report
Intersection 2: Cherry Avenue at Hill Street

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.622

Intersection Setup

Name	Cherry Avenue			Cherry Avenue			Hill Street			Hill Street		
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	0	0	0	0	0	0
Entry Pocket Length [ft]	200.0	100.0	100.0	186.0	100.0	89.00	100.0	100.0	100.0	100.0	100.0	100.0
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		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Cherry Avenue			Cherry Avenue			Hill Street			Hill Street		
Base Volume Input [veh/h]	42	1256	4	11	906	147	132	1	57	6	3	23
Base Volume Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
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	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
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]	42	1256	4	11	906	147	132	1	57	6	3	23
Peak Hour Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Other Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Total 15-Minute Volume [veh/h]	11	314	1	3	227	37	33	0	14	2	1	6
Total Analysis Volume [veh/h]	42	1256	4	11	906	147	132	1	57	6	3	23
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Protec	Permi	Permi	Protec	Permi	Permi	Permi	Permi	Permi	Permi	Permi	Permi
Signal Group	1	6	0	5	2	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.03	0.39	0.00	0.01	0.28	0.09	0.08	0.12	0.12	0.00	0.02	0.02
Intersection LOS	B											
Intersection V/C	0.622											

Intersection Level Of Service Report
Intersection 3: Walnut Avenue at E. 20th Street/Alamitos Avenue

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.601

Intersection Setup

Name	Walnut Avenue			Walnut Avenue			E. 20th Street			Alamitos 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	0	0	0	0	0	0
Entry Pocket Length [ft]	60.00	100.0	100.0	60.00	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
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		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Walnut Avenue			Walnut Avenue			E. 20th Street			Alamitos Avenue		
Base Volume Input [veh/h]	51	253	45	35	151	45	66	110	85	48	108	26
Base Volume Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
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	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
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]	51	253	45	35	151	45	66	110	85	48	108	26
Peak Hour Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Other Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Total 15-Minute Volume [veh/h]	13	63	11	9	38	11	17	28	21	12	27	7
Total Analysis Volume [veh/h]	51	253	45	35	151	45	66	110	85	48	108	26
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	20.00

Phasing & Timing

Control Type	Permi	Permi	Permi	Permi	Permi	Permi	Permi	Permi	Permi	Permi	Permi	Permi
Signal Group	0	6	0	0	2	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.03	0.19	0.19	0.02	0.12	0.12	0.04	0.16	0.16	0.03	0.11	0.11
Intersection LOS	B											
Intersection V/C	0.601											

Intersection Level Of Service Report
Intersection 2: Cherry Avenue at Hill Street

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.678

Intersection Setup

Name	Cherry Avenue			Cherry Avenue			Hill Street			Hill Street		
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	0	0	0	0	0	0
Entry Pocket Length [ft]	200.0	100.0	100.0	186.0	100.0	89.00	100.0	100.0	100.0	100.0	100.0	100.0
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		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Cherry Avenue			Cherry Avenue			Hill Street			Hill Street		
Base Volume Input [veh/h]	51	1046	9	21	1272	158	163	2	68	5	2	10
Base Volume Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
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	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
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]	51	1046	9	21	1272	158	163	2	68	5	2	10
Peak Hour Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Other Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Total 15-Minute Volume [veh/h]	13	262	2	5	318	40	41	1	17	1	1	3
Total Analysis Volume [veh/h]	51	1046	9	21	1272	158	163	2	68	5	2	10
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Protec	Permi	Permi	Protec	Permi	Permi	Permi	Permi	Permi	Permi	Permi	Permi
Signal Group	1	6	0	5	2	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.03	0.33	0.01	0.01	0.40	0.10	0.10	0.15	0.15	0.00	0.01	0.01
Intersection LOS	B											
Intersection V/C	0.678											

Intersection Level Of Service Report
Intersection 3: Walnut Avenue at E. 20th Street/Alamitos Avenue

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.533

Intersection Setup

Name	Walnut Avenue			Walnut Avenue			E. 20th Street			Alamitos 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	0	0	0	0	0	0
Entry Pocket Length [ft]	60.00	100.0	100.0	60.00	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
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		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Walnut Avenue			Walnut Avenue			E. 20th Street			Alamitos Avenue		
Base Volume Input [veh/h]	27	236	45	29	270	32	48	86	30	40	38	21
Base Volume Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
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	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
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	236	45	29	270	32	48	86	30	40	38	21
Peak Hour Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Other Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Total 15-Minute Volume [veh/h]	7	59	11	7	68	8	12	22	8	10	10	5
Total Analysis Volume [veh/h]	27	236	45	29	270	32	48	86	30	40	38	21
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	20.00

Phasing & Timing

Control Type	Permi	Permi	Permi	Permi	Permi	Permi	Permi	Permi	Permi	Permi	Permi	Permi
Signal Group	0	6	0	0	2	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.18	0.18	0.02	0.19	0.19	0.03	0.10	0.10	0.03	0.06	0.06
Intersection LOS	A											
Intersection V/C	0.533											

APPENDIX B-II

EXISTING (YEAR 2021) PLUS PROJECT TRAFFIC CONDITIONS

Intersection Level Of Service Report
Intersection 2: Cherry Avenue at Hill Street

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.622

Intersection Setup

Name	Cherry Avenue			Cherry Avenue			Hill Street			Hill Street		
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	0	0	0	0	0	0
Entry Pocket Length [ft]	200.0	100.0	100.0	186.0	100.0	89.00	100.0	100.0	100.0	100.0	100.0	100.0
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		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Cherry Avenue			Cherry Avenue			Hill Street			Hill Street		
Base Volume Input [veh/h]	42	1256	4	11	906	149	132	1	57	6	3	23
Base Volume Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
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	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
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]	42	1256	4	11	906	149	132	1	57	6	3	23
Peak Hour Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Other Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Total 15-Minute Volume [veh/h]	11	314	1	3	227	37	33	0	14	2	1	6
Total Analysis Volume [veh/h]	42	1256	4	11	906	149	132	1	57	6	3	23
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Protec	Permi	Permi	Protec	Permi	Permi	Permi	Permi	Permi	Permi	Permi	Permi
Signal Group	1	6	0	5	2	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.03	0.39	0.00	0.01	0.28	0.09	0.08	0.12	0.12	0.00	0.02	0.02
Intersection LOS	B											
Intersection V/C	0.622											

Intersection Level Of Service Report
Intersection 3: Walnut Avenue at E. 20th Street/Alamitos Avenue

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.603

Intersection Setup

Name	Walnut Avenue			Walnut Avenue			E. 20th Street			Alamitos 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	0	0	0	0	0	0
Entry Pocket Length [ft]	60.00	100.0	100.0	60.00	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
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		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Walnut Avenue			Walnut Avenue			E. 20th Street			Alamitos Avenue		
Base Volume Input [veh/h]	51	255	45	35	151	45	66	110	85	48	108	26
Base Volume Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
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	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
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]	51	255	45	35	151	45	66	110	85	48	108	26
Peak Hour Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Other Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Total 15-Minute Volume [veh/h]	13	64	11	9	38	11	17	28	21	12	27	7
Total Analysis Volume [veh/h]	51	255	45	35	151	45	66	110	85	48	108	26
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	20.00

Phasing & Timing

Control Type	Permi	Permi	Permi	Permi	Permi	Permi	Permi	Permi	Permi	Permi	Permi	Permi
Signal Group	0	6	0	0	2	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.03	0.19	0.19	0.02	0.12	0.12	0.04	0.16	0.16	0.03	0.11	0.11
Intersection LOS	B											
Intersection V/C	0.603											

Intersection Level Of Service Report
Intersection 2: Cherry Avenue at Hill Street

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.679

Intersection Setup

Name	Cherry Avenue			Cherry Avenue			Hill Street			Hill Street		
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	0	0	0	0	0	0
Entry Pocket Length [ft]	200.0	100.0	100.0	186.0	100.0	89.00	100.0	100.0	100.0	100.0	100.0	100.0
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		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Cherry Avenue			Cherry Avenue			Hill Street			Hill Street		
Base Volume Input [veh/h]	51	1046	9	21	1272	159	164	2	68	5	2	10
Base Volume Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
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	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
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]	51	1046	9	21	1272	159	164	2	68	5	2	10
Peak Hour Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Other Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Total 15-Minute Volume [veh/h]	13	262	2	5	318	40	41	1	17	1	1	3
Total Analysis Volume [veh/h]	51	1046	9	21	1272	159	164	2	68	5	2	10
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Protec	Permi	Permi	Protec	Permi	Permi	Permi	Permi	Permi	Permi	Permi	Permi
Signal Group	1	6	0	5	2	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.03	0.33	0.01	0.01	0.40	0.10	0.10	0.15	0.15	0.00	0.01	0.01
Intersection LOS	B											
Intersection V/C	0.679											

Intersection Level Of Service Report
Intersection 3: Walnut Avenue at E. 20th Street/Alamitos Avenue

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.534

Intersection Setup

Name	Walnut Avenue			Walnut Avenue			E. 20th Street			Alamitos 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	0	0	0	0	0	0
Entry Pocket Length [ft]	60.00	100.0	100.0	60.00	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
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		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Walnut Avenue			Walnut Avenue			E. 20th Street			Alamitos Avenue		
Base Volume Input [veh/h]	27	238	45	29	271	32	48	86	30	40	38	21
Base Volume Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
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	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
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	238	45	29	271	32	48	86	30	40	38	21
Peak Hour Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Other Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Total 15-Minute Volume [veh/h]	7	60	11	7	68	8	12	22	8	10	10	5
Total Analysis Volume [veh/h]	27	238	45	29	271	32	48	86	30	40	38	21
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	20.00

Phasing & Timing

Control Type	Permi	Permi	Permi	Permi	Permi	Permi	Permi	Permi	Permi	Permi	Permi	Permi
Signal Group	0	6	0	0	2	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.18	0.18	0.02	0.19	0.19	0.03	0.10	0.10	0.03	0.06	0.06
Intersection LOS	A											
Intersection V/C	0.534											

APPENDIX B-III

GENERAL PLAN BUILDOUT (YEAR 2040) TRAFFIC CONDITIONS

Intersection Level Of Service Report
Intersection 2: Cherry Avenue at Hill Street

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.715

Intersection Setup

Name	Cherry Avenue			Cherry Avenue			Hill Street			Hill Street		
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	0	0	0	0	0	0
Entry Pocket Length [ft]	200.0	100.0	100.0	186.0	100.0	89.00	100.0	100.0	100.0	100.0	100.0	100.0
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		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Cherry Avenue			Cherry Avenue			Hill Street			Hill Street		
Base Volume Input [veh/h]	50	1484	5	13	1066	163	154	1	67	7	4	28
Base Volume Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
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	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
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]	50	1484	5	13	1066	163	154	1	67	7	4	28
Peak Hour Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Other Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Total 15-Minute Volume [veh/h]	13	371	1	3	267	41	39	0	17	2	1	7
Total Analysis Volume [veh/h]	50	1484	5	13	1066	163	154	1	67	7	4	28
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Protec	Permi	Permi	Protec	Permi	Permi	Permi	Permi	Permi	Permi	Permi	Permi
Signal Group	1	6	0	5	2	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.03	0.46	0.00	0.01	0.33	0.10	0.10	0.14	0.14	0.00	0.02	0.02
Intersection LOS	C											
Intersection V/C	0.715											

Intersection Level Of Service Report
Intersection 3: Walnut Avenue at E. 20th Street/Alamitos Avenue

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.666

Intersection Setup

Name	Walnut Avenue			Walnut Avenue			E. 20th Street			Alamitos 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	0	0	0	0	0	0
Entry Pocket Length [ft]	60.00	100.0	100.0	60.00	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
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		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Walnut Avenue			Walnut Avenue			E. 20th Street			Alamitos Avenue		
Base Volume Input [veh/h]	60	285	54	41	175	54	78	131	100	57	128	31
Base Volume Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
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	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
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]	60	285	54	41	175	54	78	131	100	57	128	31
Peak Hour Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Other Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Total 15-Minute Volume [veh/h]	15	71	14	10	44	14	20	33	25	14	32	8
Total Analysis Volume [veh/h]	60	285	54	41	175	54	78	131	100	57	128	31
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	20.00

Phasing & Timing

Control Type	Permi	Permi	Permi	Permi	Permi	Permi	Permi	Permi	Permi	Permi	Permi	Permi
Signal Group	0	6	0	0	2	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.04	0.21	0.21	0.03	0.14	0.14	0.05	0.19	0.19	0.04	0.14	0.14
Intersection LOS	B											
Intersection V/C	0.666											

Intersection Level Of Service Report
Intersection 2: Cherry Avenue at Hill Street

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.778

Intersection Setup

Name	Cherry Avenue			Cherry Avenue			Hill Street			Hill Street		
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	0	0	0	0	0	0
Entry Pocket Length [ft]	200.0	100.0	100.0	186.0	100.0	89.00	100.0	100.0	100.0	100.0	100.0	100.0
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		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Cherry Avenue			Cherry Avenue			Hill Street			Hill Street		
Base Volume Input [veh/h]	60	1231	11	26	1502	184	185	2	81	6	2	12
Base Volume Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
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	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
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]	60	1231	11	26	1502	184	185	2	81	6	2	12
Peak Hour Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Other Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Total 15-Minute Volume [veh/h]	15	308	3	7	376	46	46	1	20	2	1	3
Total Analysis Volume [veh/h]	60	1231	11	26	1502	184	185	2	81	6	2	12
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Protec	Permi	Permi	Protec	Permi	Permi	Permi	Permi	Permi	Permi	Permi	Permi
Signal Group	1	6	0	5	2	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.04	0.38	0.01	0.02	0.47	0.12	0.12	0.17	0.17	0.00	0.01	0.01
Intersection LOS	C											
Intersection V/C	0.778											

Intersection Level Of Service Report
Intersection 3: Walnut Avenue at E. 20th Street/Alamitos Avenue

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.586

Intersection Setup

Name	Walnut Avenue			Walnut Avenue			E. 20th Street			Alamitos 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	0	0	0	0	0	0
Entry Pocket Length [ft]	60.00	100.0	100.0	60.00	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
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		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Walnut Avenue			Walnut Avenue			E. 20th Street			Alamitos Avenue		
Base Volume Input [veh/h]	32	274	54	34	306	38	57	101	35	48	45	26
Base Volume Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
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	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
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]	32	274	54	34	306	38	57	101	35	48	45	26
Peak Hour Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Other Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Total 15-Minute Volume [veh/h]	8	69	14	9	77	10	14	25	9	12	11	7
Total Analysis Volume [veh/h]	32	274	54	34	306	38	57	101	35	48	45	26
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	20.00

Phasing & Timing

Control Type	Permi	Permi	Permi	Permi	Permi	Permi	Permi	Permi	Permi	Permi	Permi	Permi
Signal Group	0	6	0	0	2	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.21	0.21	0.02	0.22	0.22	0.04	0.12	0.12	0.03	0.07	0.07
Intersection LOS	A											
Intersection V/C	0.586											

APPENDIX B-IV

GENERAL PLAN BUILDOUT (YEAR 2040) PLUS PROJECT TRAFFIC CONDITIONS

Intersection Level Of Service Report
Intersection 2: Cherry Avenue at Hill Street

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.715

Intersection Setup

Name	Cherry Avenue			Cherry Avenue			Hill Street			Hill Street		
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	0	0	0	0	0	0
Entry Pocket Length [ft]	200.0	100.0	100.0	186.0	100.0	89.00	100.0	100.0	100.0	100.0	100.0	100.0
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		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Cherry Avenue			Cherry Avenue			Hill Street			Hill Street		
Base Volume Input [veh/h]	50	1484	5	13	1066	165	154	1	67	7	4	28
Base Volume Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
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	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
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]	50	1484	5	13	1066	165	154	1	67	7	4	28
Peak Hour Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Other Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Total 15-Minute Volume [veh/h]	13	371	1	3	267	41	39	0	17	2	1	7
Total Analysis Volume [veh/h]	50	1484	5	13	1066	165	154	1	67	7	4	28
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Protec	Permi	Permi	Protec	Permi	Permi	Permi	Permi	Permi	Permi	Permi	Permi
Signal Group	1	6	0	5	2	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.03	0.46	0.00	0.01	0.33	0.10	0.10	0.14	0.14	0.00	0.02	0.02
Intersection LOS	C											
Intersection V/C	0.715											

Intersection Level Of Service Report
Intersection 3: Walnut Avenue at E. 20th Street/Alamitos Avenue

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.668

Intersection Setup

Name	Walnut Avenue			Walnut Avenue			E. 20th Street			Alamitos 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	0	0	0	0	0	0
Entry Pocket Length [ft]	60.00	100.0	100.0	60.00	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
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		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Walnut Avenue			Walnut Avenue			E. 20th Street			Alamitos Avenue		
Base Volume Input [veh/h]	60	287	54	41	175	54	78	131	100	57	128	31
Base Volume Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
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	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
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]	60	287	54	41	175	54	78	131	100	57	128	31
Peak Hour Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Other Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Total 15-Minute Volume [veh/h]	15	72	14	10	44	14	20	33	25	14	32	8
Total Analysis Volume [veh/h]	60	287	54	41	175	54	78	131	100	57	128	31
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	20.00

Phasing & Timing

Control Type	Permi	Permi	Permi	Permi	Permi	Permi	Permi	Permi	Permi	Permi	Permi	Permi
Signal Group	0	6	0	0	2	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.04	0.21	0.21	0.03	0.14	0.14	0.05	0.19	0.19	0.04	0.14	0.14
Intersection LOS	B											
Intersection V/C	0.668											

Intersection Level Of Service Report
Intersection 2: Cherry Avenue at Hill Street

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.779

Intersection Setup

Name	Cherry Avenue			Cherry Avenue			Hill Street			Hill Street		
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	0	0	0	0	0	0
Entry Pocket Length [ft]	200.0	100.0	100.0	186.0	100.0	89.00	100.0	100.0	100.0	100.0	100.0	100.0
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		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Cherry Avenue			Cherry Avenue			Hill Street			Hill Street		
Base Volume Input [veh/h]	60	1231	11	26	1502	185	186	2	81	6	2	12
Base Volume Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
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	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
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]	60	1231	11	26	1502	185	186	2	81	6	2	12
Peak Hour Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Other Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Total 15-Minute Volume [veh/h]	15	308	3	7	376	46	47	1	20	2	1	3
Total Analysis Volume [veh/h]	60	1231	11	26	1502	185	186	2	81	6	2	12
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	10.00

Phasing & Timing

Control Type	Protec	Permi	Permi	Protec	Permi	Permi	Permi	Permi	Permi	Permi	Permi	Permi
Signal Group	1	6	0	5	2	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.04	0.38	0.01	0.02	0.47	0.12	0.12	0.17	0.17	0.00	0.01	0.01
Intersection LOS	C											
Intersection V/C	0.779											

Intersection Level Of Service Report
Intersection 3: Walnut Avenue at E. 20th Street/Alamitos Avenue

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.586

Intersection Setup

Name	Walnut Avenue			Walnut Avenue			E. 20th Street			Alamitos 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	0	0	0	0	0	0
Entry Pocket Length [ft]	60.00	100.0	100.0	60.00	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
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		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Walnut Avenue			Walnut Avenue			E. 20th Street			Alamitos Avenue		
Base Volume Input [veh/h]	32	276	54	34	307	38	57	101	35	48	45	26
Base Volume Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
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	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
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]	32	276	54	34	307	38	57	101	35	48	45	26
Peak Hour Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Other Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Total 15-Minute Volume [veh/h]	8	69	14	9	77	10	14	25	9	12	11	7
Total Analysis Volume [veh/h]	32	276	54	34	307	38	57	101	35	48	45	26
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	20.00

Phasing & Timing

Control Type	Permi	Permi	Permi	Permi	Permi	Permi	Permi	Permi	Permi	Permi	Permi	Permi
Signal Group	0	6	0	0	2	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.21	0.21	0.02	0.22	0.22	0.04	0.12	0.12	0.03	0.07	0.07
Intersection LOS	A											
Intersection V/C	0.586											

APPENDIX C

LEVEL OF SERVICE CALCULATION WORKSHEETS (ICU METHODOLOGY)

APPENDIX C-I

EXISTING (YEAR 2021) TRAFFIC CONDITIONS

Intersection Level Of Service Report
Intersection 1: Walnut Avenue at Hill Street

Control Type:	All-way stop	Delay (sec / veh):	15.8
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.627

Intersection Setup

Name	Walnut Avenue			Walnut Avenue			Hill Street			Hill Street		
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	1	0	0	0	0	0	0
Entry Pocket Length [ft]	100.0	100.0	100.0	100.0	100.0	54.00	100.0	100.0	100.0	100.0	100.0	100.0
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		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Walnut Avenue			Walnut Avenue			Hill Street			Hill Street		
Base Volume Input [veh/h]	26	219	25	49	148	141	21	80	45	79	72	36
Base Volume Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
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	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
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]	26	219	25	49	148	141	21	80	45	79	72	36
Peak Hour Factor	0.759	0.759	0.759	0.759	0.759	0.759	0.759	0.759	0.759	0.759	0.759	0.759
Other Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Total 15-Minute Volume [veh/h]	9	72	8	16	49	46	7	26	15	26	24	12
Total Analysis Volume [veh/h]	34	289	33	65	195	186	28	105	59	104	95	47
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	568	525	597	533	538
Degree of Utilization, x	0.63	0.50	0.31	0.36	0.46

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	4.34	2.72	1.32	1.63	2.38
95th-Percentile Queue Length [ft]	108.40	68.11	33.02	40.64	59.48
Approach Delay [s/veh]	19.41	14.16		13.50	15.24
Approach LOS	C	B		B	C
Intersection Delay [s/veh]	15.78				
Intersection LOS	C				

Intersection Level Of Service Report
Intersection 2: Cherry Avenue at Hill Street

Control Type:	Signalized	Delay (sec / veh):	11.0
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.592

Intersection Setup

Name	Cherry Avenue			Cherry Avenue			Hill Street			Hill Street		
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	0	0	0	0	0	0
Entry Pocket Length [ft]	200.0	100.0	100.0	186.0	100.0	89.00	100.0	100.0	100.0	100.0	100.0	100.0
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	Cherry Avenue			Cherry Avenue			Hill Street			Hill Street		
Base Volume Input [veh/h]	42	1256	4	11	906	147	132	1	57	6	3	23
Base Volume Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
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	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
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]	42	1256	4	11	906	147	132	1	57	6	3	23
Peak Hour Factor	0.942	0.942	0.942	0.942	0.942	0.942	0.942	0.942	0.942	0.942	0.942	0.942
Other Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Total 15-Minute Volume [veh/h]	11	333	1	3	240	39	35	0	15	2	1	6
Total Analysis Volume [veh/h]	45	1333	4	12	962	156	140	1	61	6	3	24
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 major street [ped/h]	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing major street [ped/h]	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing minor street [ped/h]	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing minor street [ped/h]	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]	12.00

Phasing & Timing

Control Type	Protec	Permi	Permi	Protec	Permi	Permi	Permi	Permi	Permi	Permi	Permi	Permi
Signal Group	1	6	0	5	2	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	7	7	0	7	7	0	0	7	0	0	7	0
Maximum Green [s]	30	30	0	30	30	0	0	30	0	0	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	11	29	0	11	29	0	0	50	0	0	50	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	12	0	0	18	0	0	25	0	0	25	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	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	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	R	C	C
C, Cycle Length [s]	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
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	2.00	2.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	5	62	62	2	59	59	14	14
g / C, Green / Cycle	0.05	0.69	0.69	0.02	0.66	0.66	0.15	0.15
(v / s)_i Volume / Saturation Flow Rate	0.03	0.37	0.00	0.01	0.27	0.10	0.13	0.02
s, saturation flow rate [veh/h]	1781	3560	1589	1781	3560	1589	1530	1712
c, Capacity [veh/h]	95	2464	1100	37	2349	1048	303	311
d1, Uniform Delay [s]	41.40	6.83	4.28	43.45	7.14	5.78	36.78	32.87
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	3.67	0.86	0.01	4.95	0.53	0.30	2.52	0.15
d3, Initial Queue Delay [s]	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
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.48	0.54	0.00	0.32	0.41	0.15	0.67	0.11
d, Delay for Lane Group [s/veh]	45.08	7.68	4.29	48.40	7.68	6.08	39.29	33.02
Lane Group LOS	D	A	A	D	A	A	D	C
Critical Lane Group	No	Yes	No	Yes	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	1.06	5.40	0.02	0.31	3.87	1.06	4.45	0.63
50th-Percentile Queue Length [ft/ln]	26.42	135.1	0.53	7.80	96.69	26.43	111.28	15.71
95th-Percentile Queue Length [veh/ln]	1.90	9.22	0.04	0.56	6.96	1.90	7.91	1.13
95th-Percentile Queue Length [ft/ln]	47.55	230.4	0.95	14.04	174.0	47.57	197.79	28.28

Movement, Approach, & Intersection Results

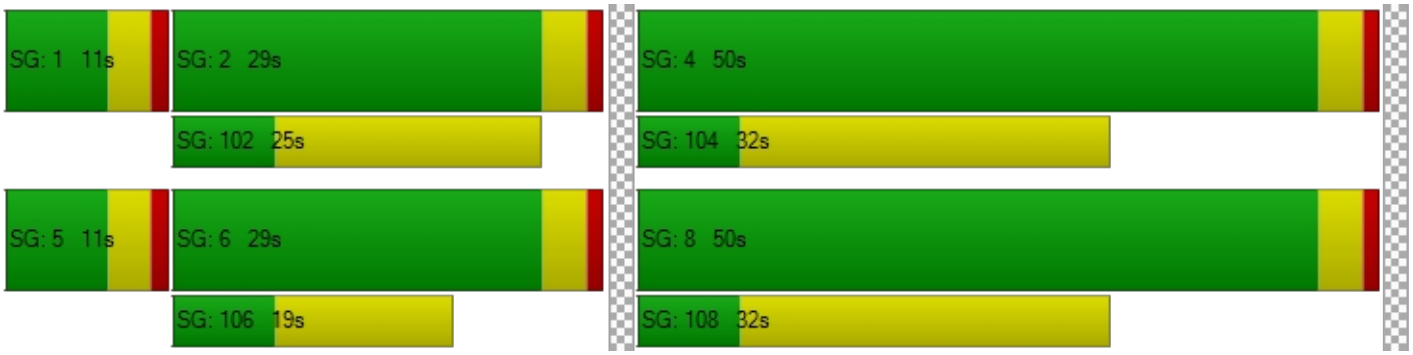
d_M, Delay for Movement [s/veh]	45.08	7.68	4.29	48.40	7.68	6.08	39.29	39.29	39.29	33.02	33.02	33.02
Movement LOS	D	A	A	D	A	A	D	D	D	C	C	C
d_A, Approach Delay [s/veh]	8.89			7.89			39.29			33.02		
Approach LOS	A			A			D			C		
d_I, Intersection Delay [s/veh]	11.00											
Intersection LOS	B											
Intersection V/C	0.592											

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]	34.67	34.67	34.67	34.67
l_p,int, Pedestrian LOS Score for Intersection	2.853	3.078	1.912	1.739
Crosswalk LOS	C	C	A	A
s_b, Saturation Flow Rate of the bicycle lane [bicycles/h]	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	556	556	1022	1022
d_b, Bicycle Delay [s]	23.47	23.47	10.76	10.76
l_b,int, Bicycle LOS Score for Intersection	2.700	2.492	1.893	1.614
Bicycle LOS	B	B	A	A

Sequence

Ring 1	1	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 3: Walnut Avenue at E. 20th Street/Alamitos Avenue

Control Type:	Signalized	Delay (sec / veh):	27.8
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.488

Intersection Setup

Name	Walnut Avenue			Walnut Avenue			E. 20th Street			Alamitos 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	0	0	0	0	0	0
Entry Pocket Length [ft]	60.00	100.0	100.0	60.00	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
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	Walnut Avenue			Walnut Avenue			E. 20th Street			Alamitos Avenue		
Base Volume Input [veh/h]	51	253	45	35	151	45	66	110	85	48	108	26
Base Volume Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
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	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
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]	51	253	45	35	151	45	66	110	85	48	108	26
Peak Hour Factor	0.757	0.757	0.757	0.757	0.757	0.757	0.757	0.757	0.757	0.757	0.757	0.757
Other Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Total 15-Minute Volume [veh/h]	17	84	15	12	50	15	22	36	28	16	36	9
Total Analysis Volume [veh/h]	67	334	59	46	199	59	87	145	112	63	143	34
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 major street [ped/h]	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing major street [ped/h]	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing minor street [ped/h]	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing minor street [ped/h]	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]	8.00

Phasing & Timing

Control Type	Permi	Permi	Permi	Permi	Permi	Permi	Permi	Permi	Permi	Permi	Permi	Permi
Signal Group	0	6	0	0	2	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	7	0	0	7	0	0	7	0	0	7	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	25	0	0	25	0	0	36	0	0	36	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	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	14	0	0	14	0	0	13	0	0	13	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												
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	9
Pedestrian Walk [s]	7
Pedestrian Clearance [s]	22

Lane Group Calculations

Lane Group	L	C	L	C	C	C
C, Cycle Length [s]	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
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]	37	37	37	37	23	23
g / C, Green / Cycle	0.41	0.41	0.41	0.41	0.25	0.25
(v / s)_i Volume / Saturation Flow Rate	0.06	0.22	0.05	0.14	0.23	0.17
s, saturation flow rate [veh/h]	1121	1822	991	1797	1503	1383
c, Capacity [veh/h]	412	757	311	747	427	397
d1, Uniform Delay [s]	23.73	19.60	27.78	17.95	32.70	29.67
k, delay calibration	0.50	0.50	0.50	0.50	0.19	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.85	2.53	1.00	1.26	6.26	1.49
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	0.16	0.52	0.15	0.35	0.81	0.60
d, Delay for Lane Group [s/veh]	24.58	22.13	28.78	19.21	38.95	31.15
Lane Group LOS	C	C	C	B	D	C
Critical Lane Group	No	Yes	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	1.15	6.42	0.87	3.80	7.83	4.67
50th-Percentile Queue Length [ft/ln]	28.69	160.55	21.85	95.07	195.73	116.82
95th-Percentile Queue Length [veh/ln]	2.07	10.58	1.57	6.84	12.42	8.22
95th-Percentile Queue Length [ft/ln]	51.65	264.45	39.33	171.12	310.45	205.44

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	24.58	22.13	22.13	28.78	19.21	19.21	38.95	38.95	38.95	31.15	31.15	31.15
Movement LOS	C	C	C	C	B	B	D	D	D	C	C	C
d_A, Approach Delay [s/veh]	22.49			20.66			38.95			31.15		
Approach LOS	C			C			D			C		
d_I, Intersection Delay [s/veh]	27.82											
Intersection LOS	C											
Intersection V/C	0.488											

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]	34.67	34.67	34.67	34.67
l_p,int, Pedestrian LOS Score for Intersection	2.300	2.310	2.109	2.019
Crosswalk LOS	B	B	B	B
s_b, Saturation Flow Rate of the bicycle lane [bicycles/h]	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	467	467	711	711
d_b, Bicycle Delay [s]	26.45	26.45	18.69	18.69
l_b,int, Bicycle LOS Score for Intersection	2.319	2.061	2.127	1.956
Bicycle LOS	B	B	B	A

Sequence

Ring 1	-	2	-	4	9	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 1: Walnut Avenue at Hill Street

Control Type:	All-way stop	Delay (sec / veh):	14.5
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.582

Intersection Setup

Name	Walnut Avenue			Walnut Avenue			Hill Street			Hill Street		
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	1	0	0	0	0	0	0
Entry Pocket Length [ft]	100.0	100.0	100.0	100.0	100.0	54.00	100.0	100.0	100.0	100.0	100.0	100.0
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		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Walnut Avenue			Walnut Avenue			Hill Street			Hill Street		
Base Volume Input [veh/h]	39	220	70	35	229	59	35	103	27	40	99	34
Base Volume Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
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	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
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]	39	220	70	35	229	59	35	103	27	40	99	34
Peak Hour Factor	0.914	0.914	0.914	0.914	0.914	0.914	0.914	0.914	0.914	0.914	0.914	0.914
Other Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Total 15-Minute Volume [veh/h]	11	60	19	10	63	16	10	28	7	11	27	9
Total Analysis Volume [veh/h]	43	241	77	38	251	65	38	113	30	44	108	37
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	620	563	641	564	567
Degree of Utilization, x	0.58	0.51	0.10	0.32	0.33

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	3.75	2.92	0.34	1.38	1.45
95th-Percentile Queue Length [ft]	93.71	73.03	8.43	34.45	36.37
Approach Delay [s/veh]	16.58	14.44		12.37	12.49
Approach LOS	C	B		B	B
Intersection Delay [s/veh]	14.47				
Intersection LOS	B				

Intersection Level Of Service Report
Intersection 2: Cherry Avenue at Hill Street

Control Type:	Signalized	Delay (sec / veh):	13.6
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.661

Intersection Setup

Name	Cherry Avenue			Cherry Avenue			Hill Street			Hill Street		
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	0	0	0	0	0	0
Entry Pocket Length [ft]	200.0	100.0	100.0	186.0	100.0	89.00	100.0	100.0	100.0	100.0	100.0	100.0
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	Cherry Avenue			Cherry Avenue			Hill Street			Hill Street		
Base Volume Input [veh/h]	51	1046	9	21	1272	158	163	2	68	5	2	10
Base Volume Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
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	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
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]	51	1046	9	21	1272	158	163	2	68	5	2	10
Peak Hour Factor	0.942	0.942	0.942	0.942	0.942	0.942	0.942	0.942	0.942	0.942	0.942	0.942
Other Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Total 15-Minute Volume [veh/h]	14	278	2	6	338	42	43	1	18	1	1	3
Total Analysis Volume [veh/h]	54	1110	10	22	1350	168	173	2	72	5	2	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 major street [ped/h]	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing major street [ped/h]	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing minor street [ped/h]	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing minor street [ped/h]	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]	12.00

Phasing & Timing

Control Type	Protec	Permi	Permi	Protec	Permi	Permi	Permi	Permi	Permi	Permi	Permi	Permi
Signal Group	1	6	0	5	2	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	7	7	0	7	7	0	0	7	0	0	7	0
Maximum Green [s]	30	30	0	30	30	0	0	30	0	0	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	11	25	0	15	29	0	0	50	0	0	50	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	12	0	0	18	0	0	25	0	0	25	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	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	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	R	C	C
C, Cycle Length [s]	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
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	2.00	2.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	5	58	58	3	56	56	17	17
g / C, Green / Cycle	0.06	0.65	0.65	0.03	0.62	0.62	0.19	0.19
(v / s)_i Volume / Saturation Flow Rate	0.03	0.31	0.01	0.01	0.38	0.11	0.16	0.01
s, saturation flow rate [veh/h]	1781	3560	1589	1781	3560	1589	1508	1679
c, Capacity [veh/h]	105	2298	1026	61	2211	987	350	365
d1, Uniform Delay [s]	41.14	8.22	5.69	42.53	10.42	7.23	35.30	30.08
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	3.89	0.73	0.02	3.58	1.27	0.37	2.61	0.06
d3, Initial Queue Delay [s]	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
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.52	0.48	0.01	0.36	0.61	0.17	0.71	0.05
d, Delay for Lane Group [s/veh]	45.03	8.95	5.71	46.11	11.69	7.61	37.91	30.13
Lane Group LOS	D	A	A	D	B	A	D	C
Critical Lane Group	Yes	No	No	No	Yes	No	Yes	No
50th-Percentile Queue Length [veh/ln]	1.26	5.03	0.06	0.53	7.53	1.34	5.40	0.32
50th-Percentile Queue Length [ft/ln]	31.60	125.7	1.62	13.36	188.2	33.40	134.92	8.08
95th-Percentile Queue Length [veh/ln]	2.28	8.71	0.12	0.96	12.03	2.41	9.21	0.58
95th-Percentile Queue Length [ft/ln]	56.88	217.7	2.92	24.06	300.7	60.13	230.17	14.55

Movement, Approach, & Intersection Results

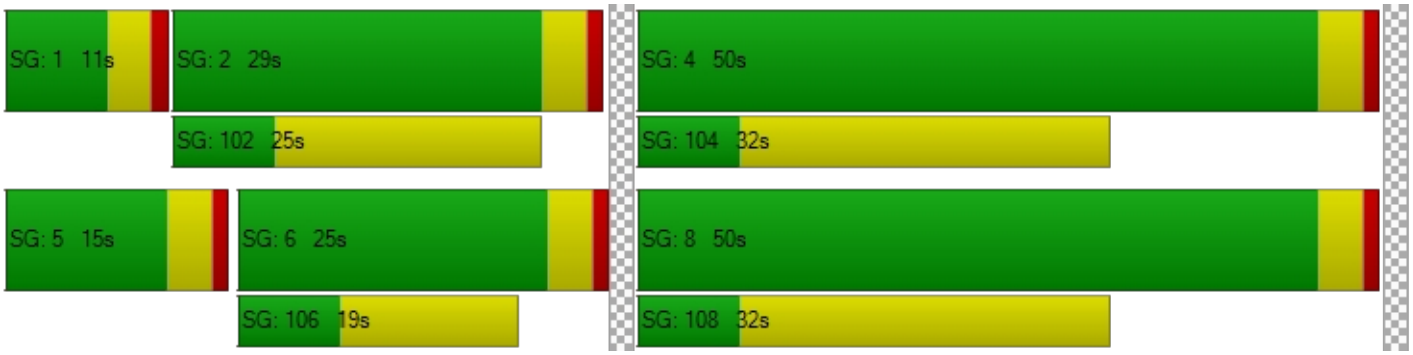
d_M, Delay for Movement [s/veh]	45.03	8.95	5.71	46.11	11.69	7.61	37.91	37.91	37.91	30.13	30.13	30.13
Movement LOS	D	A	A	D	B	A	D	D	D	C	C	C
d_A, Approach Delay [s/veh]	10.58			11.74			37.91			30.13		
Approach LOS	B			B			D			C		
d_I, Intersection Delay [s/veh]	13.56											
Intersection LOS	B											
Intersection V/C	0.661											

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]	34.67	34.67	34.67	34.67
l_p,int, Pedestrian LOS Score for Intersection	2.882	3.159	1.944	1.740
Crosswalk LOS	C	C	A	A
s_b, Saturation Flow Rate of the bicycle lane [bicycles/h]	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	467	556	1022	1022
d_b, Bicycle Delay [s]	26.45	23.47	10.76	10.76
l_b,int, Bicycle LOS Score for Intersection	2.528	2.830	1.967	1.589
Bicycle LOS	B	C	A	A

Sequence

Ring 1	1	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 3: Walnut Avenue at E. 20th Street/Alamitos Avenue

Control Type:	Signalized	Delay (sec / veh):	20.4
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.293

Intersection Setup

Name	Walnut Avenue			Walnut Avenue			E. 20th Street			Alamitos 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	0	0	0	0	0	0
Entry Pocket Length [ft]	60.00	100.0	100.0	60.00	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
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	Walnut Avenue			Walnut Avenue			E. 20th Street			Alamitos Avenue		
Base Volume Input [veh/h]	27	236	45	29	270	32	48	86	30	40	38	21
Base Volume Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
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	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
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	236	45	29	270	32	48	86	30	40	38	21
Peak Hour Factor	0.971	0.971	0.971	0.971	0.971	0.971	0.971	0.971	0.971	0.971	0.971	0.971
Other Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Total 15-Minute Volume [veh/h]	7	61	12	7	70	8	12	22	8	10	10	5
Total Analysis Volume [veh/h]	28	243	46	30	278	33	49	89	31	41	39	22
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 major street [ped/h]	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing major street [ped/h]	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing minor street [ped/h]	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing minor street [ped/h]	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]	8.00

Phasing & Timing

Control Type	Permi	Permi	Permi	Permi	Permi	Permi	Permi	Permi	Permi	Permi	Permi	Permi
Signal Group	0	6	0	0	2	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	7	0	0	7	0	0	7	0	0	7	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	25	0	0	25	0	0	36	0	0	36	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	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	14	0	0	14	0	0	13	0	0	13	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												
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	9
Pedestrian Walk [s]	7
Pedestrian Clearance [s]	22

Lane Group Calculations

Lane Group	L	C	L	C	C	C
C, Cycle Length [s]	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
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]	49	49	49	49	11	11
g / C, Green / Cycle	0.55	0.55	0.55	0.55	0.12	0.12
(v / s)_i Volume / Saturation Flow Rate	0.03	0.16	0.03	0.17	0.10	0.07
s, saturation flow rate [veh/h]	1068	1819	1090	1836	1725	1531
c, Capacity [veh/h]	532	996	549	1005	257	238
d1, Uniform Delay [s]	15.38	10.96	15.03	11.10	38.63	37.19
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]	0.19	0.74	0.19	0.80	2.87	1.22
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	0.29	0.05	0.31	0.66	0.43
d, Delay for Lane Group [s/veh]	15.57	11.70	15.21	11.90	41.50	38.41
Lane Group LOS	B	B	B	B	D	D
Critical Lane Group	No	No	No	Yes	Yes	No
50th-Percentile Queue Length [veh/ln]	0.36	3.10	0.38	3.38	3.78	2.16
50th-Percentile Queue Length [ft/ln]	8.98	77.43	9.48	84.41	94.62	54.12
95th-Percentile Queue Length [veh/ln]	0.65	5.57	0.68	6.08	6.81	3.90
95th-Percentile Queue Length [ft/ln]	16.16	139.37	17.06	151.94	170.32	97.42

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	15.57	11.70	11.70	15.21	11.90	11.90	41.50	41.50	41.50	38.41	38.41	38.41
Movement LOS	B	B	B	B	B	B	D	D	D	D	D	D
d_A, Approach Delay [s/veh]	12.04			12.20			41.50			38.41		
Approach LOS	B			B			D			D		
d_I, Intersection Delay [s/veh]	20.35											
Intersection LOS	C											
Intersection V/C	0.293											

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]	34.67	34.67	34.67	34.67
l_p,int, Pedestrian LOS Score for Intersection	2.215	2.222	1.885	1.887
Crosswalk LOS	B	B	A	A
s_b, Saturation Flow Rate of the bicycle lane [bicycles/h]	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	467	467	711	711
d_b, Bicycle Delay [s]	26.45	26.45	18.69	18.69
l_b,int, Bicycle LOS Score for Intersection	2.083	2.122	1.838	1.728
Bicycle LOS	B	B	A	A

Sequence

Ring 1	-	2	-	4	9	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



APPENDIX C-II

EXISTING (YEAR 2021) PLUS PROJECT TRAFFIC CONDITIONS

Intersection Level Of Service Report
Intersection 1: Walnut Avenue at Hill Street

Control Type:	All-way stop	Delay (sec / veh):	16.0
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.635

Intersection Setup

Name	Walnut Avenue			Walnut Avenue			Hill Street			Hill Street		
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	1	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	54.00	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		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Walnut Avenue			Walnut Avenue			Hill Street			Hill Street		
Base Volume Input [veh/h]	27	219	25	49	148	141	21	80	48	81	72	36
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	219	25	49	148	141	21	80	48	81	72	36
Peak Hour Factor	0.7590	0.7590	0.7590	0.7590	0.7590	0.7590	0.7590	0.7590	0.7590	0.7590	0.7590	0.7590
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	72	8	16	49	46	7	26	16	27	24	12
Total Analysis Volume [veh/h]	36	289	33	65	195	186	28	105	63	107	95	47
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	564	521	593	531	534
Degree of Utilization, x	0.64	0.50	0.31	0.37	0.47

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	4.45	2.76	1.33	1.69	2.45
95th-Percentile Queue Length [ft]	111.25	68.88	33.36	42.15	61.30
Approach Delay [s/veh]	19.83	14.30		13.68	15.49
Approach LOS	C	B		B	C
Intersection Delay [s/veh]	16.03				
Intersection LOS	C				

Intersection Level Of Service Report
Intersection 2: Cherry Avenue at Hill Street

Control Type:	Signalized	Delay (sec / veh):	11.0
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.592

Intersection Setup

Name	Cherry Avenue			Cherry Avenue			Hill Street			Hill Street		
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	0	0	0	0	0	0
Entry Pocket Length [ft]	200.0	100.0	100.0	186.0	100.0	89.00	100.0	100.0	100.0	100.0	100.0	100.0
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	Cherry Avenue			Cherry Avenue			Hill Street			Hill Street		
Base Volume Input [veh/h]	42	1256	4	11	906	149	132	1	57	6	3	23
Base Volume Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
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	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
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]	42	1256	4	11	906	149	132	1	57	6	3	23
Peak Hour Factor	0.942	0.942	0.942	0.942	0.942	0.942	0.942	0.942	0.942	0.942	0.942	0.942
Other Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Total 15-Minute Volume [veh/h]	11	333	1	3	240	40	35	0	15	2	1	6
Total Analysis Volume [veh/h]	45	1333	4	12	962	158	140	1	61	6	3	24
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 major street [ped/h]	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing major street [ped/h]	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing minor street [ped/h]	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing minor street [ped/h]	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]	12.00

Phasing & Timing

Control Type	Protec	Permi	Permi	Protec	Permi	Permi	Permi	Permi	Permi	Permi	Permi	Permi
Signal Group	1	6	0	5	2	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	7	7	0	7	7	0	0	7	0	0	7	0
Maximum Green [s]	30	30	0	30	30	0	0	30	0	0	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	11	29	0	11	29	0	0	50	0	0	50	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	12	0	0	18	0	0	25	0	0	25	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	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	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	R	C	C
C, Cycle Length [s]	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
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	2.00	2.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	5	62	62	2	59	59	14	14
g / C, Green / Cycle	0.05	0.69	0.69	0.02	0.66	0.66	0.15	0.15
(v / s)_i Volume / Saturation Flow Rate	0.03	0.37	0.00	0.01	0.27	0.10	0.13	0.02
s, saturation flow rate [veh/h]	1781	3560	1589	1781	3560	1589	1530	1712
c, Capacity [veh/h]	95	2464	1100	37	2349	1048	303	311
d1, Uniform Delay [s]	41.40	6.83	4.28	43.45	7.14	5.79	36.78	32.87
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	3.67	0.86	0.01	4.95	0.53	0.30	2.52	0.15
d3, Initial Queue Delay [s]	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
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.48	0.54	0.00	0.32	0.41	0.15	0.67	0.11
d, Delay for Lane Group [s/veh]	45.08	7.68	4.29	48.40	7.68	6.09	39.29	33.02
Lane Group LOS	D	A	A	D	A	A	D	C
Critical Lane Group	No	Yes	No	Yes	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	1.06	5.40	0.02	0.31	3.87	1.07	4.45	0.63
50th-Percentile Queue Length [ft/ln]	26.42	135.1	0.53	7.80	96.69	26.80	111.28	15.71
95th-Percentile Queue Length [veh/ln]	1.90	9.22	0.04	0.56	6.96	1.93	7.91	1.13
95th-Percentile Queue Length [ft/ln]	47.55	230.4	0.95	14.04	174.0	48.25	197.79	28.28

Movement, Approach, & Intersection Results

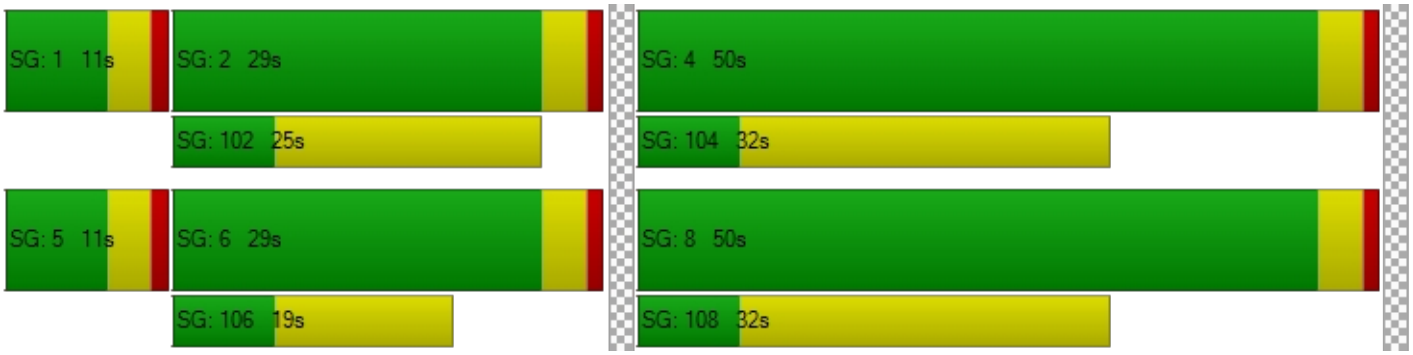
d_M, Delay for Movement [s/veh]	45.08	7.68	4.29	48.40	7.68	6.09	39.29	39.29	39.29	33.02	33.02	33.02
Movement LOS	D	A	A	D	A	A	D	D	D	C	C	C
d_A, Approach Delay [s/veh]	8.89			7.89			39.29			33.02		
Approach LOS	A			A			D			C		
d_I, Intersection Delay [s/veh]	11.00											
Intersection LOS	B											
Intersection V/C	0.592											

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]	34.67	34.67	34.67	34.67
l_p,int, Pedestrian LOS Score for Intersection	2.853	3.079	1.913	1.739
Crosswalk LOS	C	C	A	A
s_b, Saturation Flow Rate of the bicycle lane [bicycles/h]	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	556	556	1022	1022
d_b, Bicycle Delay [s]	23.47	23.47	10.76	10.76
l_b,int, Bicycle LOS Score for Intersection	2.700	2.494	1.893	1.614
Bicycle LOS	B	B	A	A

Sequence

Ring 1	1	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 3: Walnut Avenue at E. 20th Street/Alamitos Avenue

Control Type:	Signalized	Delay (sec / veh):	27.8
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.490

Intersection Setup

Name	Walnut Avenue			Walnut Avenue			E. 20th Street			Alamitos 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	0	0	0	0	0	0
Entry Pocket Length [ft]	60.00	100.0	100.0	60.00	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
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	Walnut Avenue			Walnut Avenue			E. 20th Street			Alamitos Avenue		
Base Volume Input [veh/h]	51	255	45	35	151	45	66	110	85	48	108	26
Base Volume Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
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	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
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]	51	255	45	35	151	45	66	110	85	48	108	26
Peak Hour Factor	0.757	0.757	0.757	0.757	0.757	0.757	0.757	0.757	0.757	0.757	0.757	0.757
Other Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Total 15-Minute Volume [veh/h]	17	84	15	12	50	15	22	36	28	16	36	9
Total Analysis Volume [veh/h]	67	337	59	46	199	59	87	145	112	63	143	34
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 major street [ped/h]	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing major street [ped/h]	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing minor street [ped/h]	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing minor street [ped/h]	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]	8.00

Phasing & Timing

Control Type	Permi	Permi	Permi	Permi	Permi	Permi	Permi	Permi	Permi	Permi	Permi	Permi
Signal Group	0	6	0	0	2	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	7	0	0	7	0	0	7	0	0	7	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	25	0	0	25	0	0	36	0	0	36	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	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	14	0	0	14	0	0	13	0	0	13	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												
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	9
Pedestrian Walk [s]	7
Pedestrian Clearance [s]	22

Lane Group Calculations

Lane Group	L	C	L	C	C	C
C, Cycle Length [s]	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
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]	37	37	37	37	23	23
g / C, Green / Cycle	0.41	0.41	0.41	0.41	0.25	0.25
(v / s)_i Volume / Saturation Flow Rate	0.06	0.22	0.05	0.14	0.23	0.17
s, saturation flow rate [veh/h]	1121	1822	988	1797	1503	1383
c, Capacity [veh/h]	412	757	309	747	427	397
d1, Uniform Delay [s]	23.73	19.64	27.89	17.95	32.70	29.67
k, delay calibration	0.50	0.50	0.50	0.50	0.19	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.85	2.57	1.02	1.26	6.26	1.49
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	0.16	0.52	0.15	0.35	0.81	0.60
d, Delay for Lane Group [s/veh]	24.58	22.21	28.91	19.21	38.95	31.15
Lane Group LOS	C	C	C	B	D	C
Critical Lane Group	No	Yes	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	1.15	6.49	0.88	3.80	7.83	4.67
50th-Percentile Queue Length [ft/ln]	28.69	162.18	21.91	95.07	195.73	116.82
95th-Percentile Queue Length [veh/ln]	2.07	10.66	1.58	6.84	12.42	8.22
95th-Percentile Queue Length [ft/ln]	51.65	266.61	39.45	171.12	310.45	205.44

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	24.58	22.21	22.21	28.91	19.21	19.21	38.95	38.95	38.95	31.15	31.15	31.15
Movement LOS	C	C	C	C	B	B	D	D	D	C	C	C
d_A, Approach Delay [s/veh]	22.55			20.68			38.95			31.15		
Approach LOS	C			C			D			C		
d_I, Intersection Delay [s/veh]	27.84											
Intersection LOS	C											
Intersection V/C	0.490											

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]	34.67	34.67	34.67	34.67
l_p,int, Pedestrian LOS Score for Intersection	2.301	2.311	2.109	2.019
Crosswalk LOS	B	B	B	B
s_b, Saturation Flow Rate of the bicycle lane [bicycles/h]	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	467	467	711	711
d_b, Bicycle Delay [s]	26.45	26.45	18.69	18.69
l_b,int, Bicycle LOS Score for Intersection	2.324	2.061	2.127	1.956
Bicycle LOS	B	B	B	A

Sequence

Ring 1	-	2	-	4	9	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 1: Walnut Avenue at Hill Street

Control Type:	All-way stop	Delay (sec / veh):	14.6
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.589

Intersection Setup

Name	Walnut Avenue			Walnut Avenue			Hill Street			Hill Street		
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	1	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	54.00	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		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Walnut Avenue			Walnut Avenue			Hill Street			Hill Street		
Base Volume Input [veh/h]	41	220	71	35	229	59	35	103	29	41	99	34
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]	41	220	71	35	229	59	35	103	29	41	99	34
Peak Hour Factor	0.9140	0.9140	0.9140	0.9140	0.9140	0.9140	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	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	11	60	19	10	63	16	10	28	8	11	27	9
Total Analysis Volume [veh/h]	45	241	78	38	251	65	38	113	32	45	108	37
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	618	560	638	563	565
Degree of Utilization, x	0.59	0.52	0.10	0.33	0.34

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	3.84	2.94	0.34	1.40	1.47
95th-Percentile Queue Length [ft]	95.89	73.48	8.47	35.10	36.85
Approach Delay [s/veh]	16.83	14.52		12.45	12.57
Approach LOS	C	B		B	B
Intersection Delay [s/veh]	14.60				
Intersection LOS	B				

Intersection Level Of Service Report
Intersection 2: Cherry Avenue at Hill Street

Control Type:	Signalized	Delay (sec / veh):	13.6
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.662

Intersection Setup

Name	Cherry Avenue			Cherry Avenue			Hill Street			Hill Street		
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	0	0	0	0	0	0
Entry Pocket Length [ft]	200.0	100.0	100.0	186.0	100.0	89.00	100.0	100.0	100.0	100.0	100.0	100.0
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	Cherry Avenue			Cherry Avenue			Hill Street			Hill Street		
Base Volume Input [veh/h]	51	1046	9	21	1272	159	164	2	68	5	2	10
Base Volume Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
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	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
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]	51	1046	9	21	1272	159	164	2	68	5	2	10
Peak Hour Factor	0.942	0.942	0.942	0.942	0.942	0.942	0.942	0.942	0.942	0.942	0.942	0.942
Other Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Total 15-Minute Volume [veh/h]	14	278	2	6	338	42	44	1	18	1	1	3
Total Analysis Volume [veh/h]	54	1110	10	22	1350	169	174	2	72	5	2	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 major street [ped/h]	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing major street [ped/h]	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing minor street [ped/h]	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing minor street [ped/h]	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]	12.00

Phasing & Timing

Control Type	Protec	Permi	Permi	Protec	Permi	Permi	Permi	Permi	Permi	Permi	Permi	Permi
Signal Group	1	6	0	5	2	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	7	7	0	7	7	0	0	7	0	0	7	0
Maximum Green [s]	30	30	0	30	30	0	0	30	0	0	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	11	25	0	15	29	0	0	50	0	0	50	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	12	0	0	18	0	0	25	0	0	25	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	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	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	R	C	C
C, Cycle Length [s]	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
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	2.00	2.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	5	58	58	3	56	56	17	17
g / C, Green / Cycle	0.06	0.65	0.65	0.03	0.62	0.62	0.19	0.19
(v / s)_i Volume / Saturation Flow Rate	0.03	0.31	0.01	0.01	0.38	0.11	0.16	0.01
s, saturation flow rate [veh/h]	1781	3560	1589	1781	3560	1589	1508	1679
c, Capacity [veh/h]	105	2296	1025	61	2208	986	351	366
d1, Uniform Delay [s]	41.14	8.25	5.72	42.53	10.46	7.27	35.26	30.02
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	3.89	0.73	0.02	3.58	1.27	0.38	2.61	0.05
d3, Initial Queue Delay [s]	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
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.52	0.48	0.01	0.36	0.61	0.17	0.71	0.05
d, Delay for Lane Group [s/veh]	45.03	8.98	5.73	46.11	11.73	7.64	37.88	30.08
Lane Group LOS	D	A	A	D	B	A	D	C
Critical Lane Group	Yes	No	No	No	Yes	No	Yes	No
50th-Percentile Queue Length [veh/ln]	1.26	5.05	0.06	0.53	7.55	1.35	5.42	0.32
50th-Percentile Queue Length [ft/ln]	31.60	126.1	1.62	13.36	188.7	33.72	135.44	8.07
95th-Percentile Queue Length [veh/ln]	2.28	8.73	0.12	0.96	12.06	2.43	9.23	0.58
95th-Percentile Queue Length [ft/ln]	56.88	218.2	2.92	24.06	301.4	60.69	230.87	14.53

Movement, Approach, & Intersection Results

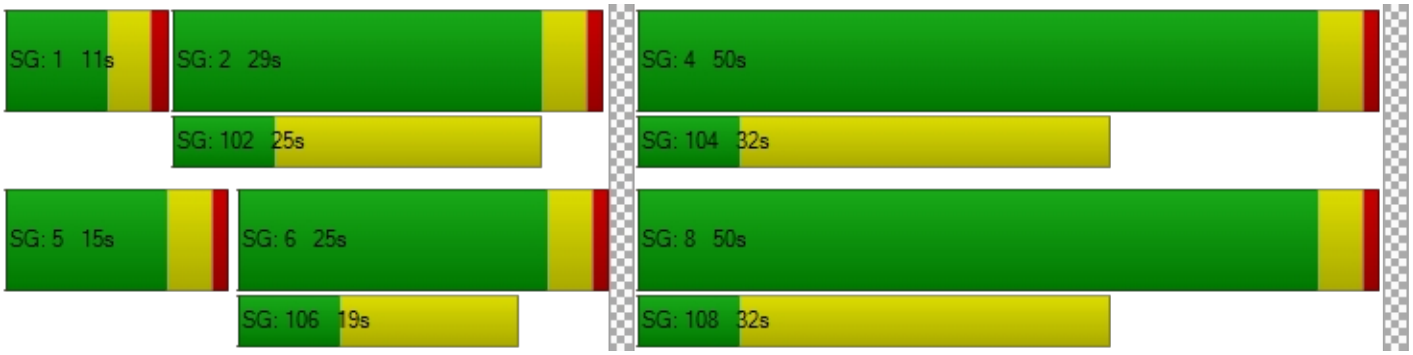
d_M, Delay for Movement [s/veh]	45.03	8.98	5.73	46.11	11.73	7.64	37.88	37.88	37.88	30.08	30.08	30.08
Movement LOS	D	A	A	D	B	A	D	D	D	C	C	C
d_A, Approach Delay [s/veh]	10.61			11.78			37.88			30.08		
Approach LOS	B			B			D			C		
d_I, Intersection Delay [s/veh]	13.60											
Intersection LOS	B											
Intersection V/C	0.662											

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]	34.67	34.67	34.67	34.67
l_p,int, Pedestrian LOS Score for Intersection	2.882	3.161	1.945	1.740
Crosswalk LOS	C	C	A	A
s_b, Saturation Flow Rate of the bicycle lane [bicycles/h]	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	467	556	1022	1022
d_b, Bicycle Delay [s]	26.45	23.47	10.76	10.76
l_b,int, Bicycle LOS Score for Intersection	2.528	2.831	1.969	1.589
Bicycle LOS	B	C	A	A

Sequence

Ring 1	1	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 3: Walnut Avenue at E. 20th Street/Alamitos Avenue

Control Type:	Signalized	Delay (sec / veh):	20.3
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.294

Intersection Setup

Name	Walnut Avenue			Walnut Avenue			E. 20th Street			Alamitos 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	0	0	0	0	0	0
Entry Pocket Length [ft]	60.00	100.0	100.0	60.00	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
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	Walnut Avenue			Walnut Avenue			E. 20th Street			Alamitos Avenue		
Base Volume Input [veh/h]	27	238	45	29	271	32	48	86	30	40	38	21
Base Volume Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
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	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
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	238	45	29	271	32	48	86	30	40	38	21
Peak Hour Factor	0.971	0.971	0.971	0.971	0.971	0.971	0.971	0.971	0.971	0.971	0.971	0.971
Other Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Total 15-Minute Volume [veh/h]	7	61	12	7	70	8	12	22	8	10	10	5
Total Analysis Volume [veh/h]	28	245	46	30	279	33	49	89	31	41	39	22
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 major street [ped/h]	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing major street [ped/h]	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing minor street [ped/h]	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing minor street [ped/h]	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]	8.00

Phasing & Timing

Control Type	Permi	Permi	Permi	Permi	Permi	Permi	Permi	Permi	Permi	Permi	Permi	Permi
Signal Group	0	6	0	0	2	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	7	0	0	7	0	0	7	0	0	7	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	37	0	0	37	0	0	24	0	0	24	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	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	14	0	0	14	0	0	13	0	0	13	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												
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	9
Pedestrian Walk [s]	7
Pedestrian Clearance [s]	22

Lane Group Calculations

Lane Group	L	C	L	C	C	C
C, Cycle Length [s]	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
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]	49	49	49	49	11	11
g / C, Green / Cycle	0.55	0.55	0.55	0.55	0.12	0.12
(v / s)_i Volume / Saturation Flow Rate	0.03	0.16	0.03	0.17	0.10	0.07
s, saturation flow rate [veh/h]	1067	1819	1088	1836	1720	1521
c, Capacity [veh/h]	534	998	550	1007	254	235
d1, Uniform Delay [s]	15.26	10.93	14.92	11.07	38.72	37.28
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]	0.19	0.74	0.19	0.80	2.97	1.26
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	0.29	0.05	0.31	0.66	0.43
d, Delay for Lane Group [s/veh]	15.44	11.68	15.11	11.87	41.69	38.53
Lane Group LOS	B	B	B	B	D	D
Critical Lane Group	No	No	No	Yes	Yes	No
50th-Percentile Queue Length [veh/ln]	0.36	3.12	0.38	3.38	3.79	2.17
50th-Percentile Queue Length [ft/ln]	8.94	77.90	9.44	84.56	94.87	54.23
95th-Percentile Queue Length [veh/ln]	0.64	5.61	0.68	6.09	6.83	3.90
95th-Percentile Queue Length [ft/ln]	16.09	140.23	16.99	152.21	170.77	97.62

Movement, Approach, & Intersection Results

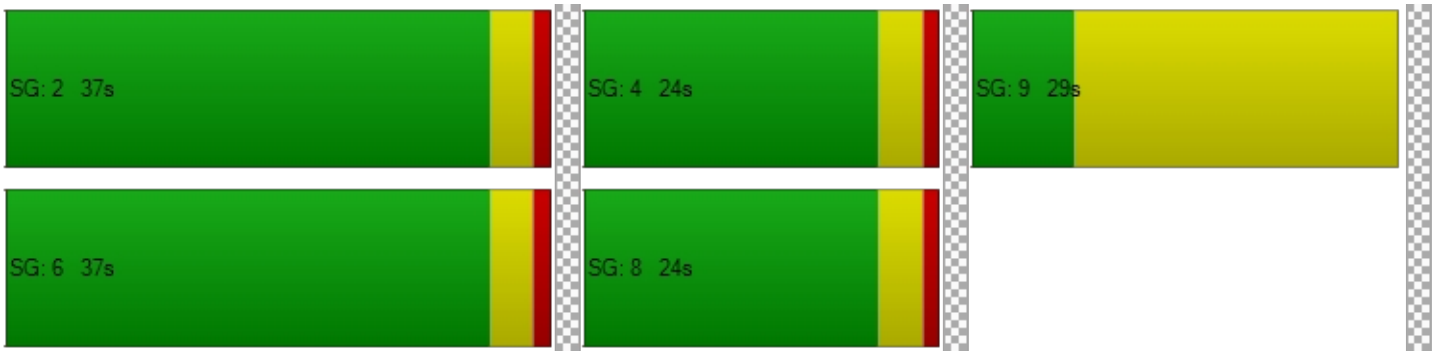
d_M, Delay for Movement [s/veh]	15.44	11.68	11.68	15.11	11.87	11.87	41.69	41.69	41.69	38.53	38.53	38.53
Movement LOS	B	B	B	B	B	B	D	D	D	D	D	D
d_A, Approach Delay [s/veh]	12.01			12.15			41.69			38.53		
Approach LOS	B			B			D			D		
d_I, Intersection Delay [s/veh]	20.35											
Intersection LOS	C											
Intersection V/C	0.294											

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]	34.67	34.67	34.67	34.67
l_p,int, Pedestrian LOS Score for Intersection	2.216	2.223	1.885	1.887
Crosswalk LOS	B	B	A	A
s_b, Saturation Flow Rate of the bicycle lane [bicycles/h]	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	733	733	444	444
d_b, Bicycle Delay [s]	18.05	18.05	27.22	27.22
l_b,int, Bicycle LOS Score for Intersection	2.086	2.124	1.838	1.728
Bicycle LOS	B	B	A	A

Sequence

Ring 1	-	2	-	4	9	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



APPENDIX C-III

GENERAL PLAN BUILDOUT (YEAR 2040) TRAFFIC CONDITIONS

Intersection Level Of Service Report
Intersection 1: Walnut Avenue at Hill Street

Control Type:	All-way stop	Delay (sec / veh):	24.4
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.829

Intersection Setup

Name	Walnut Avenue			Walnut Avenue			Hill Street			Hill Street		
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	1	0	0	0	0	0	0
Entry Pocket Length [ft]	100.0	100.0	100.0	100.0	100.0	54.00	100.0	100.0	100.0	100.0	100.0	100.0
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		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Walnut Avenue			Walnut Avenue			Hill Street			Hill Street		
Base Volume Input [veh/h]	31	259	27	59	173	167	26	94	50	84	85	43
Base Volume Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
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	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
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]	31	259	27	59	173	167	26	94	50	84	85	43
Peak Hour Factor	0.759	0.759	0.759	0.759	0.759	0.759	0.759	0.759	0.759	0.759	0.759	0.759
Other Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Total 15-Minute Volume [veh/h]	10	85	9	19	57	55	9	31	16	28	28	14
Total Analysis Volume [veh/h]	41	341	36	78	228	220	34	124	66	111	112	57
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	504	468	527	465	473
Degree of Utilization, x	0.83	0.65	0.42	0.48	0.59

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	8.25	4.61	2.04	2.57	3.76
95th-Percentile Queue Length [ft]	206.19	115.33	51.12	64.16	93.92
Approach Delay [s/veh]	36.08	19.83		17.71	21.01
Approach LOS	E	C		C	C
Intersection Delay [s/veh]	24.42				
Intersection LOS	C				

Intersection Level Of Service Report
Intersection 2: Cherry Avenue at Hill Street

Control Type:	Signalized	Delay (sec / veh):	13.1
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.698

Intersection Setup

Name	Cherry Avenue			Cherry Avenue			Hill Street			Hill Street		
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	0	0	0	0	0	0
Entry Pocket Length [ft]	200.0	100.0	100.0	186.0	100.0	89.00	100.0	100.0	100.0	100.0	100.0	100.0
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	Cherry Avenue			Cherry Avenue			Hill Street			Hill Street		
Base Volume Input [veh/h]	50	1484	5	13	1066	163	154	1	67	7	4	28
Base Volume Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
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	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
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]	50	1484	5	13	1066	163	154	1	67	7	4	28
Peak Hour Factor	0.942	0.942	0.942	0.942	0.942	0.942	0.942	0.942	0.942	0.942	0.942	0.942
Other Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Total 15-Minute Volume [veh/h]	13	394	1	3	283	43	41	0	18	2	1	7
Total Analysis Volume [veh/h]	53	1575	5	14	1132	173	163	1	71	7	4	30
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 major street [ped/h]	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing major street [ped/h]	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing minor street [ped/h]	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing minor street [ped/h]	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]	12.00

Phasing & Timing

Control Type	Protec	Permi	Permi	Protec	Permi	Permi	Permi	Permi	Permi	Permi	Permi	Permi
Signal Group	1	6	0	5	2	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	7	7	0	7	7	0	0	7	0	0	7	0
Maximum Green [s]	30	30	0	30	30	0	0	30	0	0	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	11	29	0	11	29	0	0	50	0	0	50	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	12	0	0	18	0	0	25	0	0	25	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	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	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	R	C	C
C, Cycle Length [s]	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
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	2.00	2.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	5	60	60	2	57	57	16	16
g / C, Green / Cycle	0.06	0.67	0.67	0.02	0.63	0.63	0.18	0.18
(v / s)_i Volume / Saturation Flow Rate	0.03	0.44	0.00	0.01	0.32	0.11	0.15	0.02
s, saturation flow rate [veh/h]	1781	3560	1589	1781	3560	1589	1522	1708
c, Capacity [veh/h]	103	2372	1059	42	2251	1005	337	349
d1, Uniform Delay [s]	41.19	8.99	5.03	43.25	8.93	6.83	35.69	31.28
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	3.96	1.48	0.01	4.55	0.81	0.37	2.62	0.15
d3, Initial Queue Delay [s]	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
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.52	0.66	0.00	0.33	0.50	0.17	0.70	0.12
d, Delay for Lane Group [s/veh]	45.16	10.47	5.04	47.80	9.73	7.20	38.31	31.43
Lane Group LOS	D	B	A	D	A	A	D	C
Critical Lane Group	No	Yes	No	Yes	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	1.24	8.17	0.03	0.36	5.47	1.33	5.15	0.76
50th-Percentile Queue Length [ft/ln]	31.07	204.2	0.74	8.93	136.8	33.13	128.67	18.97
95th-Percentile Queue Length [veh/ln]	2.24	12.86	0.05	0.64	9.31	2.39	8.87	1.37
95th-Percentile Queue Length [ft/ln]	55.93	321.4	1.33	16.07	232.7	59.64	221.68	34.15

Movement, Approach, & Intersection Results

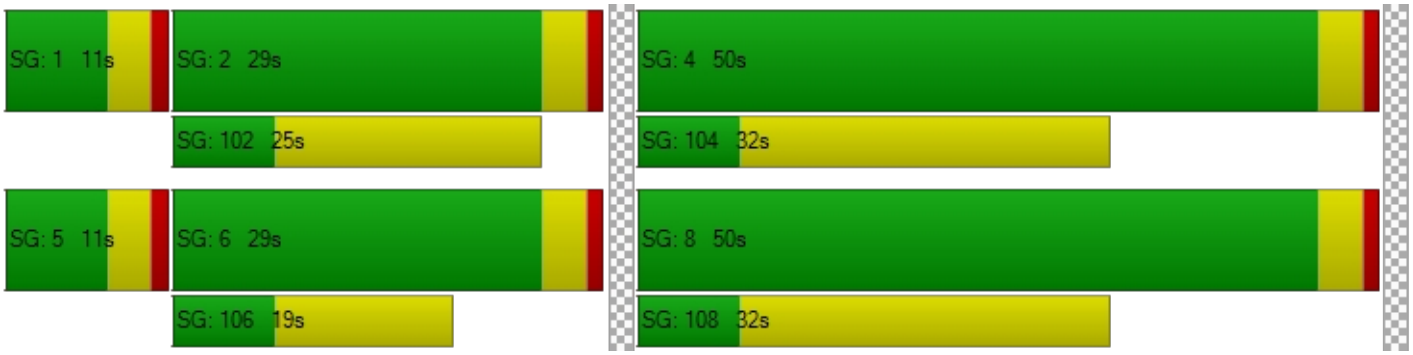
d_M, Delay for Movement [s/veh]	45.16	10.47	5.04	47.80	9.73	7.20	38.31	38.31	38.31	31.43	31.43	31.43
Movement LOS	D	B	A	D	A	A	D	D	D	C	C	C
d_A, Approach Delay [s/veh]	11.58			9.80			38.31			31.43		
Approach LOS	B			A			D			C		
d_I, Intersection Delay [s/veh]	13.05											
Intersection LOS	B											
Intersection V/C	0.698											

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]	34.67	34.67	34.67	34.67
l_p,int, Pedestrian LOS Score for Intersection	2.924	3.186	1.941	1.744
Crosswalk LOS	C	C	A	A
s_b, Saturation Flow Rate of the bicycle lane [bicycles/h]	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	556	556	1022	1022
d_b, Bicycle Delay [s]	23.47	23.47	10.76	10.76
l_b,int, Bicycle LOS Score for Intersection	2.907	2.648	1.947	1.627
Bicycle LOS	C	B	A	A

Sequence

Ring 1	1	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 3: Walnut Avenue at E. 20th Street/Alamitos Avenue

Control Type:	Signalized	Delay (sec / veh):	31.7
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.578

Intersection Setup

Name	Walnut Avenue			Walnut Avenue			E. 20th Street			Alamitos 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	0	0	0	0	0	0
Entry Pocket Length [ft]	60.00	100.0	100.0	60.00	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
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	Walnut Avenue			Walnut Avenue			E. 20th Street			Alamitos Avenue		
Base Volume Input [veh/h]	60	285	54	41	175	54	78	131	100	57	128	31
Base Volume Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
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	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
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]	60	285	54	41	175	54	78	131	100	57	128	31
Peak Hour Factor	0.757	0.757	0.757	0.757	0.757	0.757	0.757	0.757	0.757	0.757	0.757	0.757
Other Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Total 15-Minute Volume [veh/h]	20	94	18	14	58	18	26	43	33	19	42	10
Total Analysis Volume [veh/h]	79	376	71	54	231	71	103	173	132	75	169	41
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 major street [ped/h]	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing major street [ped/h]	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing minor street [ped/h]	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing minor street [ped/h]	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]	8.00

Phasing & Timing

Control Type	Permi	Permi	Permi	Permi	Permi	Permi	Permi	Permi	Permi	Permi	Permi	Permi
Signal Group	0	6	0	0	2	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	7	0	0	7	0	0	7	0	0	7	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	25	0	0	25	0	0	36	0	0	36	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	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	14	0	0	14	0	0	13	0	0	13	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												
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	9
Pedestrian Walk [s]	7
Pedestrian Clearance [s]	22

Lane Group Calculations

Lane Group	L	C	L	C	C	C
C, Cycle Length [s]	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
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]	33	33	33	33	27	27
g / C, Green / Cycle	0.36	0.36	0.36	0.36	0.30	0.30
(v / s)_i Volume / Saturation Flow Rate	0.07	0.25	0.06	0.17	0.28	0.22
s, saturation flow rate [veh/h]	1077	1819	943	1795	1453	1316
c, Capacity [veh/h]	310	662	207	654	488	447
d1, Uniform Delay [s]	30.08	24.15	35.76	21.90	30.52	26.86
k, delay calibration	0.50	0.50	0.50	0.50	0.30	0.17
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.98	5.44	3.04	2.34	9.89	2.31
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	0.26	0.67	0.26	0.46	0.84	0.64
d, Delay for Lane Group [s/veh]	32.06	29.59	38.80	24.24	40.41	29.17
Lane Group LOS	C	C	D	C	D	C
Critical Lane Group	No	Yes	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	1.60	8.73	1.25	5.16	9.67	5.45
50th-Percentile Queue Length [ft/ln]	40.08	218.17	31.25	128.96	241.63	136.16
95th-Percentile Queue Length [veh/ln]	2.89	13.57	2.25	8.88	14.76	9.27
95th-Percentile Queue Length [ft/ln]	72.14	339.28	56.25	222.08	369.10	231.85

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	32.06	29.59	29.59	38.80	24.24	24.24	40.41	40.41	40.41	29.17	29.17	29.17
Movement LOS	C	C	C	D	C	C	D	D	D	C	C	C
d_A, Approach Delay [s/veh]	29.96			26.45			40.41			29.17		
Approach LOS	C			C			D			C		
d_I, Intersection Delay [s/veh]	31.73											
Intersection LOS	C											
Intersection V/C	0.578											

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]	34.67	34.67	34.67	34.67
l_p,int, Pedestrian LOS Score for Intersection	2.360	2.371	2.181	2.075
Crosswalk LOS	B	B	B	B
s_b, Saturation Flow Rate of the bicycle lane [bicycles/h]	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	467	467	711	711
d_b, Bicycle Delay [s]	26.45	26.45	18.69	18.69
l_b,int, Bicycle LOS Score for Intersection	2.428	2.147	2.233	2.030
Bicycle LOS	B	B	B	B

Sequence

Ring 1	-	2	-	4	9	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 1: Walnut Avenue at Hill Street

Control Type:	All-way stop	Delay (sec / veh):	20.1
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.736

Intersection Setup

Name	Walnut Avenue			Walnut Avenue			Hill Street			Hill Street		
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	1	0	0	0	0	0	0
Entry Pocket Length [ft]	100.0	100.0	100.0	100.0	100.0	54.00	100.0	100.0	100.0	100.0	100.0	100.0
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		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Walnut Avenue			Walnut Avenue			Hill Street			Hill Street		
Base Volume Input [veh/h]	44	258	75	41	271	70	41	122	32	45	117	40
Base Volume Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
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	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
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]	44	258	75	41	271	70	41	122	32	45	117	40
Peak Hour Factor	0.914	0.914	0.914	0.914	0.914	0.914	0.914	0.914	0.914	0.914	0.914	0.914
Other Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Total 15-Minute Volume [veh/h]	12	71	21	11	74	19	11	33	9	12	32	11
Total Analysis Volume [veh/h]	48	282	82	45	296	77	45	133	35	49	128	44
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	560	514	579	506	510
Degree of Utilization, x	0.74	0.66	0.13	0.42	0.43

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	6.24	4.83	0.46	2.06	2.17
95th-Percentile Queue Length [ft]	156.12	120.78	11.42	51.62	54.26
Approach Delay [s/veh]	25.23	20.12		15.19	15.38
Approach LOS	D	C		C	C
Intersection Delay [s/veh]	20.13				
Intersection LOS	C				

Intersection Level Of Service Report
Intersection 2: Cherry Avenue at Hill Street

Control Type:	Signalized	Delay (sec / veh):	16.7
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.776

Intersection Setup

Name	Cherry Avenue			Cherry Avenue			Hill Street			Hill Street		
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	0	0	0	0	0	0
Entry Pocket Length [ft]	200.0	100.0	100.0	186.0	100.0	89.00	100.0	100.0	100.0	100.0	100.0	100.0
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	Cherry Avenue			Cherry Avenue			Hill Street			Hill Street		
Base Volume Input [veh/h]	60	1231	11	26	1502	184	185	2	81	6	2	12
Base Volume Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
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	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
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]	60	1231	11	26	1502	184	185	2	81	6	2	12
Peak Hour Factor	0.942	0.942	0.942	0.942	0.942	0.942	0.942	0.942	0.942	0.942	0.942	0.942
Other Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Total 15-Minute Volume [veh/h]	16	327	3	7	399	49	49	1	21	2	1	3
Total Analysis Volume [veh/h]	64	1307	12	28	1594	195	196	2	86	6	2	13
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 major street [ped/h]	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing major street [ped/h]	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing minor street [ped/h]	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing minor street [ped/h]	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]	12.00

Phasing & Timing

Control Type	Protec	Permi	Permi	Protec	Permi	Permi	Permi	Permi	Permi	Permi	Permi	Permi
Signal Group	1	6	0	5	2	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	7	7	0	7	7	0	0	7	0	0	7	0
Maximum Green [s]	30	30	0	30	30	0	0	30	0	0	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	11	25	0	15	29	0	0	50	0	0	50	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	12	0	0	18	0	0	25	0	0	25	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	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	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	R	C	C
C, Cycle Length [s]	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
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	2.00	2.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	6	55	55	4	53	53	19	19
g / C, Green / Cycle	0.06	0.62	0.62	0.04	0.59	0.59	0.21	0.21
(v / s)_i Volume / Saturation Flow Rate	0.04	0.37	0.01	0.02	0.45	0.12	0.19	0.01
s, saturation flow rate [veh/h]	1781	3560	1589	1781	3560	1589	1504	1663
c, Capacity [veh/h]	113	2186	976	72	2105	940	387	404
d1, Uniform Delay [s]	40.99	10.59	6.76	42.12	13.62	8.57	34.14	28.29
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	4.45	1.22	0.02	3.41	2.60	0.50	2.71	0.05
d3, Initial Queue Delay [s]	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
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.57	0.60	0.01	0.39	0.76	0.21	0.73	0.05
d, Delay for Lane Group [s/veh]	45.44	11.81	6.78	45.53	16.22	9.07	36.85	28.34
Lane Group LOS	D	B	A	D	B	A	D	C
Critical Lane Group	Yes	No	No	No	Yes	No	Yes	No
50th-Percentile Queue Length [veh/ln]	1.50	7.33	0.09	0.67	11.31	1.76	6.17	0.36
50th-Percentile Queue Length [ft/ln]	37.60	183.1	2.19	16.73	282.7	43.89	154.15	9.09
95th-Percentile Queue Length [veh/ln]	2.71	11.77	0.16	1.20	16.83	3.16	10.24	0.65
95th-Percentile Queue Length [ft/ln]	67.67	294.1	3.95	30.11	420.6	79.01	255.95	16.37

Movement, Approach, & Intersection Results

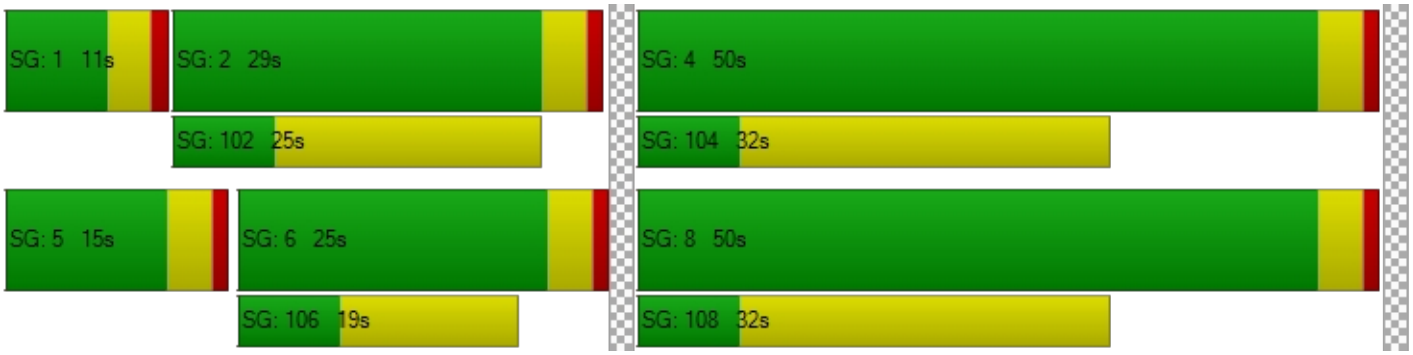
d_M, Delay for Movement [s/veh]	45.44	11.81	6.78	45.53	16.22	9.07	36.85	36.85	36.85	28.34	28.34	28.34
Movement LOS	D	B	A	D	B	A	D	D	D	C	C	C
d_A, Approach Delay [s/veh]	13.32			15.91			36.85			28.34		
Approach LOS	B			B			D			C		
d_I, Intersection Delay [s/veh]	16.66											
Intersection LOS	B											
Intersection V/C	0.776											

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]	34.67	34.67	34.67	34.67
l_p,int, Pedestrian LOS Score for Intersection	2.960	3.273	1.980	1.745
Crosswalk LOS	C	C	A	A
s_b, Saturation Flow Rate of the bicycle lane [bicycles/h]	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	467	556	1022	1022
d_b, Bicycle Delay [s]	26.45	23.47	10.76	10.76
l_b,int, Bicycle LOS Score for Intersection	2.701	3.059	2.028	1.594
Bicycle LOS	B	C	B	A

Sequence

Ring 1	1	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 3: Walnut Avenue at E. 20th Street/Alamitos Avenue

Control Type:	Signalized	Delay (sec / veh):	21.5
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.341

Intersection Setup

Name	Walnut Avenue			Walnut Avenue			E. 20th Street			Alamitos 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	0	0	0	0	0	0
Entry Pocket Length [ft]	60.00	100.0	100.0	60.00	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
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	Walnut Avenue			Walnut Avenue			E. 20th Street			Alamitos Avenue		
Base Volume Input [veh/h]	32	274	54	34	306	38	57	101	35	48	45	26
Base Volume Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
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	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
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]	32	274	54	34	306	38	57	101	35	48	45	26
Peak Hour Factor	0.971	0.971	0.971	0.971	0.971	0.971	0.971	0.971	0.971	0.971	0.971	0.971
Other Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Total 15-Minute Volume [veh/h]	8	71	14	9	79	10	15	26	9	12	12	7
Total Analysis Volume [veh/h]	33	282	56	35	315	39	59	104	36	49	46	27
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 major street [ped/h]	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing major street [ped/h]	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing minor street [ped/h]	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing minor street [ped/h]	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]	8.00

Phasing & Timing

Control Type	Permi	Permi	Permi	Permi	Permi	Permi	Permi	Permi	Permi	Permi	Permi	Permi
Signal Group	0	6	0	0	2	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	7	0	0	7	0	0	7	0	0	7	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	25	0	0	25	0	0	36	0	0	36	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	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	14	0	0	14	0	0	13	0	0	13	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												
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	9
Pedestrian Walk [s]	7
Pedestrian Clearance [s]	22

Lane Group Calculations

Lane Group	L	C	L	C	C	C
C, Cycle Length [s]	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
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]	47	47	47	47	13	13
g / C, Green / Cycle	0.53	0.53	0.53	0.53	0.14	0.14
(v / s)_i Volume / Saturation Flow Rate	0.03	0.19	0.03	0.19	0.12	0.08
s, saturation flow rate [veh/h]	1027	1817	1042	1834	1694	1484
c, Capacity [veh/h]	466	957	477	966	288	263
d1, Uniform Delay [s]	18.15	12.40	17.87	12.51	37.67	36.03
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]	0.29	1.02	0.30	1.07	2.97	1.28
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	0.07	0.35	0.07	0.37	0.69	0.46
d, Delay for Lane Group [s/veh]	18.45	13.43	18.17	13.58	40.65	37.31
Lane Group LOS	B	B	B	B	D	D
Critical Lane Group	No	No	No	Yes	Yes	No
50th-Percentile Queue Length [veh/ln]	0.47	3.99	0.50	4.21	4.43	2.56
50th-Percentile Queue Length [ft/ln]	11.80	99.64	12.39	105.27	110.83	63.98
95th-Percentile Queue Length [veh/ln]	0.85	7.17	0.89	7.58	7.89	4.61
95th-Percentile Queue Length [ft/ln]	21.24	179.35	22.30	189.40	197.16	115.16

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	18.45	13.43	13.43	18.17	13.58	13.58	40.65	40.65	40.65	37.31	37.31	37.31
Movement LOS	B	B	B	B	B	B	D	D	D	D	D	D
d_A, Approach Delay [s/veh]	13.87			14.00			40.65			37.31		
Approach LOS	B			B			D			D		
d_I, Intersection Delay [s/veh]	21.49											
Intersection LOS	C											
Intersection V/C	0.341											

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]	34.67	34.67	34.67	34.67
l_p,int, Pedestrian LOS Score for Intersection	2.260	2.270	1.916	1.919
Crosswalk LOS	B	B	A	A
s_b, Saturation Flow Rate of the bicycle lane [bicycles/h]	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	467	467	711	711
d_b, Bicycle Delay [s]	26.45	26.45	18.69	18.69
l_b,int, Bicycle LOS Score for Intersection	2.172	2.201	1.888	1.761
Bicycle LOS	B	B	A	A

Sequence

Ring 1	-	2	-	4	9	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



APPENDIX C-IV

GENERAL PLAN BUILDOUT (YEAR 2040) PLUS PROJECT TRAFFIC CONDITIONS

Intersection Level Of Service Report
Intersection 1: Walnut Avenue at Hill Street

Control Type:	All-way stop	Delay (sec / veh):	25.0
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.837

Intersection Setup

Name	Walnut Avenue			Walnut Avenue			Hill Street			Hill Street		
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	1	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	54.00	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		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Walnut Avenue			Walnut Avenue			Hill Street			Hill Street		
Base Volume Input [veh/h]	32	259	27	59	173	167	26	94	53	86	85	43
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]	32	259	27	59	173	167	26	94	53	86	85	43
Peak Hour Factor	0.7590	0.7590	0.7590	0.7590	0.7590	0.7590	0.7590	0.7590	0.7590	0.7590	0.7590	0.7590
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	85	9	19	57	55	9	31	17	28	28	14
Total Analysis Volume [veh/h]	42	341	36	78	228	220	34	124	70	113	112	57
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	501	465	523	464	471
Degree of Utilization, x	0.84	0.66	0.42	0.49	0.60

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	8.43	4.67	2.07	2.66	3.85
95th-Percentile Queue Length [ft]	210.76	116.86	51.71	66.60	96.35
Approach Delay [s/veh]	37.17	20.10		18.06	21.43
Approach LOS	E	C		C	C
Intersection Delay [s/veh]	24.95				
Intersection LOS	C				

Intersection Level Of Service Report
Intersection 2: Cherry Avenue at Hill Street

Control Type:	Signalized	Delay (sec / veh):	13.0
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.698

Intersection Setup

Name	Cherry Avenue			Cherry Avenue			Hill Street			Hill Street		
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	0	0	0	0	0	0
Entry Pocket Length [ft]	200.0	100.0	100.0	186.0	100.0	89.00	100.0	100.0	100.0	100.0	100.0	100.0
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	Cherry Avenue			Cherry Avenue			Hill Street			Hill Street		
Base Volume Input [veh/h]	50	1484	5	13	1066	165	154	1	67	7	4	28
Base Volume Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
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	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
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]	50	1484	5	13	1066	165	154	1	67	7	4	28
Peak Hour Factor	0.942	0.942	0.942	0.942	0.942	0.942	0.942	0.942	0.942	0.942	0.942	0.942
Other Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Total 15-Minute Volume [veh/h]	13	394	1	3	283	44	41	0	18	2	1	7
Total Analysis Volume [veh/h]	53	1575	5	14	1132	175	163	1	71	7	4	30
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 major street [ped/h]	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing major street [ped/h]	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing minor street [ped/h]	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing minor street [ped/h]	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]	12.00

Phasing & Timing

Control Type	Protec	Permi	Permi	Protec	Permi	Permi	Permi	Permi	Permi	Permi	Permi	Permi
Signal Group	1	6	0	5	2	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	7	7	0	7	7	0	0	7	0	0	7	0
Maximum Green [s]	30	30	0	30	30	0	0	30	0	0	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	11	29	0	11	29	0	0	50	0	0	50	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	12	0	0	18	0	0	25	0	0	25	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	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	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	R	C	C
C, Cycle Length [s]	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
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	2.00	2.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	5	60	60	2	57	57	16	16
g / C, Green / Cycle	0.06	0.67	0.67	0.02	0.63	0.63	0.18	0.18
(v / s)_i Volume / Saturation Flow Rate	0.03	0.44	0.00	0.01	0.32	0.11	0.15	0.02
s, saturation flow rate [veh/h]	1781	3560	1589	1781	3560	1589	1522	1708
c, Capacity [veh/h]	103	2372	1059	42	2251	1005	337	349
d1, Uniform Delay [s]	41.19	8.99	5.03	43.25	8.93	6.84	35.69	31.28
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	3.96	1.48	0.01	4.55	0.81	0.38	2.62	0.15
d3, Initial Queue Delay [s]	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
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.52	0.66	0.00	0.33	0.50	0.17	0.70	0.12
d, Delay for Lane Group [s/veh]	45.16	10.47	5.04	47.80	9.73	7.22	38.31	31.43
Lane Group LOS	D	B	A	D	A	A	D	C
Critical Lane Group	No	Yes	No	Yes	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	1.24	8.17	0.03	0.36	5.47	1.34	5.15	0.76
50th-Percentile Queue Length [ft/ln]	31.07	204.2	0.74	8.93	136.8	33.57	128.67	18.97
95th-Percentile Queue Length [veh/ln]	2.24	12.86	0.05	0.64	9.31	2.42	8.87	1.37
95th-Percentile Queue Length [ft/ln]	55.93	321.4	1.33	16.07	232.7	60.42	221.68	34.15

Movement, Approach, & Intersection Results

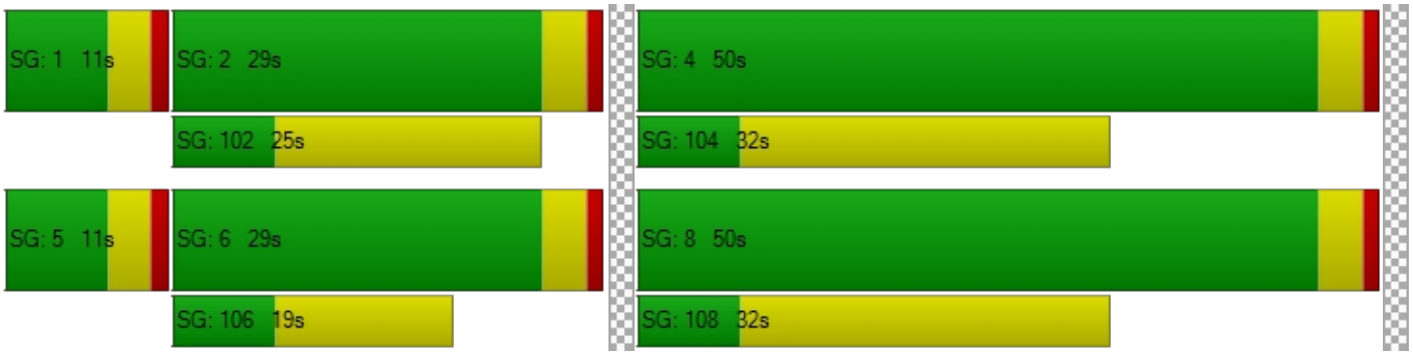
d_M, Delay for Movement [s/veh]	45.16	10.47	5.04	47.80	9.73	7.22	38.31	38.31	38.31	31.43	31.43	31.43
Movement LOS	D	B	A	D	A	A	D	D	D	C	C	C
d_A, Approach Delay [s/veh]	11.58			9.80			38.31			31.43		
Approach LOS	B			A			D			C		
d_I, Intersection Delay [s/veh]	13.05											
Intersection LOS	B											
Intersection V/C	0.698											

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]	34.67	34.67	34.67	34.67
l_p,int, Pedestrian LOS Score for Intersection	2.924	3.186	1.942	1.744
Crosswalk LOS	C	C	A	A
s_b, Saturation Flow Rate of the bicycle lane [bicycles/h]	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	556	556	1022	1022
d_b, Bicycle Delay [s]	23.47	23.47	10.76	10.76
l_b,int, Bicycle LOS Score for Intersection	2.907	2.649	1.947	1.627
Bicycle LOS	C	B	A	A

Sequence

Ring 1	1	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 3: Walnut Avenue at E. 20th Street/Alamitos Avenue

Control Type:	Signalized	Delay (sec / veh):	31.8
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.580

Intersection Setup

Name	Walnut Avenue			Walnut Avenue			E. 20th Street			Alamitos 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	0	0	0	0	0	0
Entry Pocket Length [ft]	60.00	100.0	100.0	60.00	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
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	Walnut Avenue			Walnut Avenue			E. 20th Street			Alamitos Avenue		
Base Volume Input [veh/h]	60	287	54	41	175	54	78	131	100	57	128	31
Base Volume Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
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	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
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]	60	287	54	41	175	54	78	131	100	57	128	31
Peak Hour Factor	0.757	0.757	0.757	0.757	0.757	0.757	0.757	0.757	0.757	0.757	0.757	0.757
Other Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Total 15-Minute Volume [veh/h]	20	95	18	14	58	18	26	43	33	19	42	10
Total Analysis Volume [veh/h]	79	379	71	54	231	71	103	173	132	75	169	41
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 major street [ped/h]	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing major street [ped/h]	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing minor street [ped/h]	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing minor street [ped/h]	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]	8.00

Phasing & Timing

Control Type	Permi	Permi	Permi	Permi	Permi	Permi	Permi	Permi	Permi	Permi	Permi	Permi
Signal Group	0	6	0	0	2	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	7	0	0	7	0	0	7	0	0	7	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	25	0	0	25	0	0	36	0	0	36	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	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	14	0	0	14	0	0	13	0	0	13	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												
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	9
Pedestrian Walk [s]	7
Pedestrian Clearance [s]	22

Lane Group Calculations

Lane Group	L	C	L	C	C	C
C, Cycle Length [s]	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
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]	33	33	33	33	27	27
g / C, Green / Cycle	0.36	0.36	0.36	0.36	0.30	0.30
(v / s)_i Volume / Saturation Flow Rate	0.07	0.25	0.06	0.17	0.28	0.22
s, saturation flow rate [veh/h]	1077	1819	940	1795	1453	1316
c, Capacity [veh/h]	310	662	205	654	488	447
d1, Uniform Delay [s]	30.08	24.21	35.91	21.90	30.52	26.86
k, delay calibration	0.50	0.50	0.50	0.50	0.30	0.17
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.98	5.54	3.10	2.34	9.89	2.31
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	0.26	0.68	0.26	0.46	0.84	0.64
d, Delay for Lane Group [s/veh]	32.06	29.75	39.02	24.24	40.41	29.17
Lane Group LOS	C	C	D	C	D	C
Critical Lane Group	No	Yes	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	1.60	8.81	1.25	5.16	9.67	5.45
50th-Percentile Queue Length [ft/ln]	40.08	220.36	31.37	128.96	241.63	136.16
95th-Percentile Queue Length [veh/ln]	2.89	13.68	2.26	8.88	14.76	9.27
95th-Percentile Queue Length [ft/ln]	72.14	342.08	56.47	222.08	369.10	231.85

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	32.06	29.75	29.75	39.02	24.24	24.24	40.41	40.41	40.41	29.17	29.17	29.17
Movement LOS	C	C	C	D	C	C	D	D	D	C	C	C
d_A, Approach Delay [s/veh]	30.09			26.48			40.41			29.17		
Approach LOS	C			C			D			C		
d_I, Intersection Delay [s/veh]	31.78											
Intersection LOS	C											
Intersection V/C	0.580											

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]	34.67	34.67	34.67	34.67
l_p,int, Pedestrian LOS Score for Intersection	2.361	2.372	2.181	2.075
Crosswalk LOS	B	B	B	B
s_b, Saturation Flow Rate of the bicycle lane [bicycles/h]	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	467	467	711	711
d_b, Bicycle Delay [s]	26.45	26.45	18.69	18.69
l_b,int, Bicycle LOS Score for Intersection	2.432	2.147	2.233	2.030
Bicycle LOS	B	B	B	B

Sequence

Ring 1	-	2	-	4	9	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 1: Walnut Avenue at Hill Street

Control Type:	All-way stop	Delay (sec / veh):	20.4
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.744

Intersection Setup

Name	Walnut Avenue			Walnut Avenue			Hill Street			Hill Street		
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	1	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	54.00	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		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Walnut Avenue			Walnut Avenue			Hill Street			Hill Street		
Base Volume Input [veh/h]	46	258	76	41	271	70	41	122	34	46	117	40
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]	46	258	76	41	271	70	41	122	34	46	117	40
Peak Hour Factor	0.9140	0.9140	0.9140	0.9140	0.9140	0.9140	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	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	13	71	21	11	74	19	11	33	9	13	32	11
Total Analysis Volume [veh/h]	50	282	83	45	296	77	45	133	37	50	128	44
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	558	512	576	505	507
Degree of Utilization, x	0.74	0.67	0.13	0.43	0.44

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	6.41	4.87	0.46	2.11	2.20
95th-Percentile Queue Length [ft]	160.27	121.82	11.48	52.66	55.04
Approach Delay [s/veh]	25.85	20.30		15.34	15.52
Approach LOS	D	C		C	C
Intersection Delay [s/veh]	20.44				
Intersection LOS	C				

Intersection Level Of Service Report
Intersection 2: Cherry Avenue at Hill Street

Control Type:	Signalized	Delay (sec / veh):	16.7
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.777

Intersection Setup

Name	Cherry Avenue			Cherry Avenue			Hill Street			Hill Street		
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	0	0	0	0	0	0
Entry Pocket Length [ft]	200.0	100.0	100.0	186.0	100.0	89.00	100.0	100.0	100.0	100.0	100.0	100.0
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	Cherry Avenue			Cherry Avenue			Hill Street			Hill Street		
Base Volume Input [veh/h]	60	1231	11	26	1502	185	186	2	81	6	2	12
Base Volume Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
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	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
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]	60	1231	11	26	1502	185	186	2	81	6	2	12
Peak Hour Factor	0.942	0.942	0.942	0.942	0.942	0.942	0.942	0.942	0.942	0.942	0.942	0.942
Other Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Total 15-Minute Volume [veh/h]	16	327	3	7	399	49	49	1	21	2	1	3
Total Analysis Volume [veh/h]	64	1307	12	28	1594	196	197	2	86	6	2	13
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 major street [ped/h]	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing major street [ped/h]	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing minor street [ped/h]	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing minor street [ped/h]	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]	12.00

Phasing & Timing

Control Type	Protec	Permi	Permi	Protec	Permi	Permi	Permi	Permi	Permi	Permi	Permi	Permi
Signal Group	1	6	0	5	2	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	7	7	0	7	7	0	0	7	0	0	7	0
Maximum Green [s]	30	30	0	30	30	0	0	30	0	0	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	11	25	0	15	29	0	0	50	0	0	50	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	12	0	0	18	0	0	25	0	0	25	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	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	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	R	C	C
C, Cycle Length [s]	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
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	2.00	2.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	6	55	55	4	53	53	19	19
g / C, Green / Cycle	0.06	0.61	0.61	0.04	0.59	0.59	0.21	0.21
(v / s)_i Volume / Saturation Flow Rate	0.04	0.37	0.01	0.02	0.45	0.12	0.19	0.01
s, saturation flow rate [veh/h]	1781	3560	1589	1781	3560	1589	1504	1664
c, Capacity [veh/h]	113	2184	975	72	2103	939	388	406
d1, Uniform Delay [s]	40.99	10.63	6.78	42.12	13.66	8.61	34.11	28.24
k, delay calibration	0.11	0.50	0.50	0.11	0.50	0.50	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	4.45	1.22	0.02	3.41	2.62	0.51	2.72	0.05
d3, Initial Queue Delay [s]	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
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.57	0.60	0.01	0.39	0.76	0.21	0.73	0.05
d, Delay for Lane Group [s/veh]	45.44	11.85	6.80	45.53	16.28	9.11	36.82	28.29
Lane Group LOS	D	B	A	D	B	A	D	C
Critical Lane Group	Yes	No	No	No	Yes	No	Yes	No
50th-Percentile Queue Length [veh/ln]	1.50	7.35	0.09	0.67	11.34	1.77	6.19	0.36
50th-Percentile Queue Length [ft/ln]	37.60	183.6	2.20	16.73	283.5	44.26	154.66	9.08
95th-Percentile Queue Length [veh/ln]	2.71	11.79	0.16	1.20	16.86	3.19	10.27	0.65
95th-Percentile Queue Length [ft/ln]	67.67	294.8	3.96	30.11	421.5	79.66	256.63	16.35

Movement, Approach, & Intersection Results

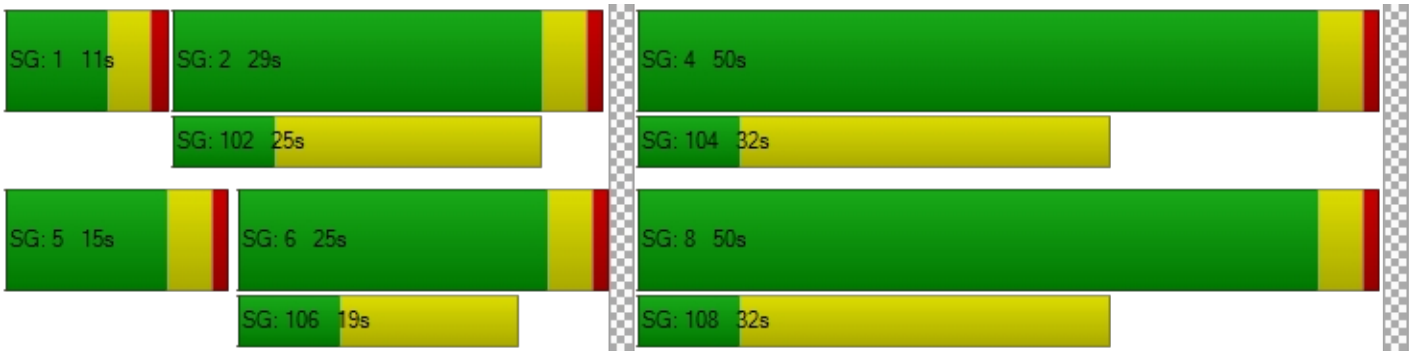
d_M, Delay for Movement [s/veh]	45.44	11.85	6.80	45.53	16.28	9.11	36.82	36.82	36.82	28.29	28.29	28.29
Movement LOS	D	B	A	D	B	A	D	D	D	C	C	C
d_A, Approach Delay [s/veh]	13.36			15.96			36.82			28.29		
Approach LOS	B			B			D			C		
d_I, Intersection Delay [s/veh]	16.71											
Intersection LOS	B											
Intersection V/C	0.777											

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]	34.67	34.67	34.67	34.67
l_p,int, Pedestrian LOS Score for Intersection	2.960	3.275	1.981	1.745
Crosswalk LOS	C	C	A	A
s_b, Saturation Flow Rate of the bicycle lane [bicycles/h]	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	467	556	1022	1022
d_b, Bicycle Delay [s]	26.45	23.47	10.76	10.76
l_b,int, Bicycle LOS Score for Intersection	2.701	3.059	2.030	1.594
Bicycle LOS	B	C	B	A

Sequence

Ring 1	1	2	-	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 3: Walnut Avenue at E. 20th Street/Alamitos Avenue

Control Type:	Signalized	Delay (sec / veh):	21.5
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.341

Intersection Setup

Name	Walnut Avenue			Walnut Avenue			E. 20th Street			Alamitos 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	0	0	0	0	0	0
Entry Pocket Length [ft]	60.00	100.0	100.0	60.00	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
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	Walnut Avenue			Walnut Avenue			E. 20th Street			Alamitos Avenue		
Base Volume Input [veh/h]	32	276	54	34	307	38	57	101	35	48	45	26
Base Volume Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
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	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
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]	32	276	54	34	307	38	57	101	35	48	45	26
Peak Hour Factor	0.971	0.971	0.971	0.971	0.971	0.971	0.971	0.971	0.971	0.971	0.971	0.971
Other Adjustment Factor	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Total 15-Minute Volume [veh/h]	8	71	14	9	79	10	15	26	9	12	12	7
Total Analysis Volume [veh/h]	33	284	56	35	316	39	59	104	36	49	46	27
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 major street [ped/h]	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing major street [ped/h]	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing minor street [ped/h]	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing minor street [ped/h]	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]	8.00

Phasing & Timing

Control Type	Permi	Permi	Permi	Permi	Permi	Permi	Permi	Permi	Permi	Permi	Permi	Permi
Signal Group	0	6	0	0	2	0	0	8	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	7	0	0	7	0	0	7	0	0	7	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	25	0	0	25	0	0	36	0	0	36	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	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	14	0	0	14	0	0	13	0	0	13	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												
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	9
Pedestrian Walk [s]	7
Pedestrian Clearance [s]	22

Lane Group Calculations

Lane Group	L	C	L	C	C	C
C, Cycle Length [s]	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
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]	47	47	47	47	13	13
g / C, Green / Cycle	0.53	0.53	0.53	0.53	0.14	0.14
(v / s)_i Volume / Saturation Flow Rate	0.03	0.19	0.03	0.19	0.12	0.08
s, saturation flow rate [veh/h]	1026	1817	1040	1834	1694	1484
c, Capacity [veh/h]	465	957	475	966	288	263
d1, Uniform Delay [s]	18.18	12.42	17.92	12.52	37.67	36.03
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]	0.30	1.03	0.30	1.08	2.97	1.28
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	0.07	0.36	0.07	0.37	0.69	0.46
d, Delay for Lane Group [s/veh]	18.48	13.45	18.22	13.60	40.65	37.31
Lane Group LOS	B	B	B	B	D	D
Critical Lane Group	No	No	No	Yes	Yes	No
50th-Percentile Queue Length [veh/ln]	0.47	4.01	0.50	4.23	4.43	2.56
50th-Percentile Queue Length [ft/ln]	11.81	100.37	12.41	105.64	110.83	63.98
95th-Percentile Queue Length [veh/ln]	0.85	7.23	0.89	7.60	7.89	4.61
95th-Percentile Queue Length [ft/ln]	21.26	180.67	22.34	189.92	197.16	115.16

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	18.48	13.45	13.45	18.22	13.60	13.60	40.65	40.65	40.65	37.31	37.31	37.31
Movement LOS	B	B	B	B	B	B	D	D	D	D	D	D
d_A, Approach Delay [s/veh]	13.90			14.01			40.65			37.31		
Approach LOS	B			B			D			D		
d_I, Intersection Delay [s/veh]	21.48											
Intersection LOS	C											
Intersection V/C	0.341											

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]	34.67	34.67	34.67	34.67
l_p,int, Pedestrian LOS Score for Intersection	2.261	2.271	1.916	1.919
Crosswalk LOS	B	B	A	A
s_b, Saturation Flow Rate of the bicycle lane [bicycles/h]	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	467	467	711	711
d_b, Bicycle Delay [s]	26.45	26.45	18.69	18.69
l_b,int, Bicycle LOS Score for Intersection	2.175	2.203	1.888	1.761
Bicycle LOS	B	B	A	A

Sequence

Ring 1	-	2	-	4	9	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

