Transportation Impact Study for the Winery and Warehouse at the Napa Airport Business Park

Prepared for the County of Napa

File Numbers: PP22-00307 and PP22-00308

Submitted by

W-Trans

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Executive Summary

The potential transportation impacts that would be associated with two proposed developments at the Napa Airport Business Park in the County of Napa were evaluated, though a specific tenant has not yet been identified for either project. The proposed winery project includes a 143,312 square foot building for tank fermentation and storage of bulk wine. The facility would normally be staffed with 16 full-time and 7 part-time employees, with employment increasing to approximately 35 total employees during harvest. The winery is expected to generate an average of 71 daily trips during non-harvest months, including 23 weekday a.m. and p.m. peak hour trips, and during harvest months, it would be expected to generate 104 trips per day, with 34 weekday peak hour trips. Because the winery would be a production-only facility and have no tasting room, the weekend peak period was not evaluated.

The proposed warehouse building would be 66,915 square feet in size; it is anticipated that the use would be classified as a warehouse for trip generation purposes. The facility would be staffed with up to 30 employees and is expected to generate 114 trips per day, including 11 morning peak hour trips and 12 evening peak hour trips.

Pedestrian, bicycle, and transit facilities are adequate and would be improved by the sidewalk installation included as part of each project. A left-turn lane would not be warranted at either project's driveways. The project would not cause any queues to increase and cause an impact. The proposed projects would be designed to adequately accommodate emergency response vehicles if applicable standards are followed, resulting in a less-than-significant impact on emergency response. To ensure adequate sight distance at the projects' driveways, proposed landscaping within the vision triangle should consist of either low-lying foliage (three feet high or less) or trees with all branches trimmed to a minimum height of seven feet above the roadway elevation.

Though the winery project would be presumed to have a less-than-significant impact on VMT, potential impacts would be anticipated due to the warehouse project. The implementation of TDM measures, which could include a commute trip reduction program, a ridesharing program, telework/compressed/flex schedules, and providing end-of-trip bicycle facilities, could reduce VMT by approximately 15 percent and result in a less-than-significant impact. Transportation Demand Management (TDM) Plans should be prepared by future tenants and include measures necessary to achieve this 15-percent reduction.

Under Existing Conditions, the study intersections are operating acceptably with the exception of SR 12-29/Airport Boulevard, which operates unacceptably. All intersections would be expected to continue operating at the same service levels with volumes from one or both projects added. Under Future and Future plus Project Conditions, the eastbound Gateway Road approach to Devlin Road/Gateway Road is expected to operate unacceptably during the p.m. peak hour, and SR 12-29/Airport Boulevard would continue to operate unacceptably during both peak hours. Under all conditions, the projects would have an acceptable effect on operation since the addition of either project individually or together does not cause delay to increase on eastbound Gateway Road at Devlin Road over what it would be without the projects, and the projects increase the volumes at SR 12-29/Airport Boulevard, which operates deficiently, by less than one percent.

Each of the proposed projects as planned would provide a parking supply that would satisfy the County Zoning Code's off-street parking requirements, and it is recommended that each project provide a minimum of ten (10) bicycle parking spaces, with at least five for each project covered.

Introduction

This report presents an analysis of the potential transportation impacts that would be associated with two proposed developments at the Napa Airport Business Park in the County of Napa. The traffic study was completed in accordance with the criteria established by the County and is consistent with standard traffic engineering techniques.

Prelude

The purpose of a traffic impact study is to provide County staff and policy makers with data that they can use to make an informed decision regarding the potential transportation impacts of a proposed project, and any associated improvements that would be required to mitigate these impacts to an acceptable level under CEQA, the County's General Plan, or other policies. This report provides an analysis of those items that are identified as areas of environmental concern under the California Environmental Quality Act (CEQA) and that, if significant, require an EIR. Impacts associated with consistency with policies related to pedestrians, bicyclists, and to transit; the vehicle miles traveled (VMT) generated by the project; potential safety concerns such as increased queuing in dedicated turn lanes, adequacy of sight distance, need for turn lanes, and need for additional right-of-way controls; and emergency access are addressed in the context of the CEQA criteria. While no longer a part of the CEQA review process, vehicular traffic service levels at key intersections were evaluated for consistency with General Plan policies by determining the number of new trips that the proposed use would be expected to generate, distributing these trips to the surrounding street system based on anticipated travel patterns specific to the proposed project, then analyzing the effect the new traffic would be expected to have on the study intersections and any need for improvements to maintain acceptable operation. Adequacy of parking is also addressed as a policy issue.

Applied Criteria

The report is organized to provide background data that supports the various aspects of the analysis, followed by the assessment of CEQA issues and the evaluation of policy-related issues. The CEQA criteria evaluated are as follows.

Would the project:

a. Conflict with a program, plan, ordinance, or policy addressing the circulation system, including transit, roadway, bicycle, and pedestrian facilities?
b. Conflict or be inconsistent with CEQA Guidelines § 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?

Project Profile

The proposed winery project includes a 143,312 square foot building for tank fermentation and storage for bulk wine in stainless steel tanks. The facility would be staffed with 16 full-time and 7 part-time employees during non-harvest season. During harvest season, typically August through October, employment would increase to approximately 35 total employees. The building would be used during

harvest for crushing up to 450,000 gallons of wine. Wine storage (tank and barrel) and bottling would take place on a year-round basis.

The proposed warehouse building would be 66,915 square feet in size and the use would be consistent with allowable warehouse uses as outlined in the Napa County Zoning Code. The facility would be staffed with up to 30 employees.

A specific user has not yet been identified for either project.

The County of Napa file numbers for these projects are PP22-00307 and PP22-00308. The project sites are located on the north side of Technology Way and east of Morris Court, as shown in Figure 1.

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Transportation Impact Study for a Winery and Warehouse at the Napa Airport Business Park

Figure 1 – Study Area and Existing Lane Configurations

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Transportation Setting

Study Area and Periods

The study area varies depending on the topic. For pedestrian trips it consists of all streets within a half-mile of the project site that would lie along primary routes of pedestrian travel or those leading to nearby generators. For bicycle trips it consists of all streets within one mile of the project site that would lie along primary routes of bicycle travel. For the safety and operational analyses, it consists of the project frontage and the following intersections:

1. Devlin Road/Gateway Road
1. Devlin Road/Airport Boulevard
2. SR 12-29/Airport Boulevard

Operating conditions during the weekday a.m. and p.m. peak periods were evaluated to capture the highest potential impacts for the proposed project as well as the highest volumes on the local transportation network. The morning peak hour occurs between 7:00 and 9:00 a.m. and reflects conditions during the home to work or school commute, while the p.m. peak hour occurs between 4:00 and 6:00 p.m. and typically reflects the highest level of congestion during the homeward bound commute. It is noted that while a weekend peak is often evaluated for winery projects, because the proposed project is a production-only facility and would not have visitors, it would not generate trips on the weekend except during harvest. Counts were obtained for the study intersections on Thursday, August 24, 2023. Copies are provided in Appendix A.

Study Intersections

Devlin Road/Gateway Road is a two-way stop-controlled intersection with the Gateway Road approaches stop-controlled. The eastbound and westbound right lanes are flared, and there are Class II bike lanes on both approaches of Devlin Road.

Devlin Road/Airport Boulevard is a four-way signalized intersection with protected left-turn phasing on the eastbound and westbound approaches and split phasing on the northbound and southbound approaches. Marked crosswalks exist on all four legs, with the east and west legs having continental crosswalks. Pedestrian phasing exists on all four legs, and Class II bike lanes exist on all but the south leg of the intersection.

SR 12-29/Airport Boulevard is a signalized four-legged intersection with protected left-turn phasing on the northbound and southbound approaches and split phasing on the eastbound and westbound approaches. Marked crosswalks and pedestrian phasing do not exist on any of the legs of the intersection. Channelized right turns exist on all except the northbound approach, which is flared. Class II bike lanes exist on the eastbound and westbound approaches.

The locations of the study intersections and the existing lane configurations and controls are shown in Figure 1.

Collision History

The collision histories for the study intersections were reviewed to determine any trends or patterns that may indicate a safety issue. Collision rates were calculated based on records available from the California Highway Patrol as published in their Statewide Integrated Traffic Records System (SWITRS) reports. The most current five-year period available is January 1, 2018, through December 31, 2022.

As presented in Table 1, the calculated collision rates for the study intersections were compared to average collision rates for similar facilities statewide, as indicated in *2020 Collision Data on California State Highways*, California Department of Transportation (Caltrans). These average rates statewide are for intersections in the same rural environment, with the same number of approaches (three or four), and the same controls (two-way stop or traffic signal). All three study intersections have collision rates below the statewide average. Therefore, no remedial actions or improvements are recommended. The collision rate calculations are provided in Appendix B.

Table 1 – Collision Rates at the Study Intersections

Study Intersection	Number of Collisions (2018-2022)	Calculated Collision Rate (c/mve)	Statewide Average Collision Rate (c/mve)
1. Devlin Rd/Gateway Rd	7	0.30	0.36
2. Devlin Rd/Airport Blvd	14	0.49	0.74
3. SR 12-29/Airport Blvd	19	0.22	0.74

Note: c/mve = collisions per million vehicles entering

Project Data

The two projects consist of a winery project and a warehouse project. The proposed winery project (Project 1) includes a 143,312 square foot building for tank fermentation and storage for bulk wine in stainless steel tanks. The facility would be staffed with 16 full-time and 7 part-time employees during non-harvest season. During harvest season, typically August through October, employment would increase to approximately 35 total employees. The building would be used during harvest for crushing up to 450,000 gallons of wine. Wine storage (tank and barrel) and bottling would take place on a year-round basis.

The proposed warehouse building (Project 2) would be 66,915 square feet in size and the use would be consistent with allowable warehouse uses as outlined in Napa County Zoning Code. The facility would be staffed with up to 30 employees.

Specific users have not been identified for either project. Both projects would be located on the north side of Technology Way and Morris Court within the Industrial Park Area of the Napa County Airport Business Park.

The proposed project site plans are shown in Figures 2 and 3.

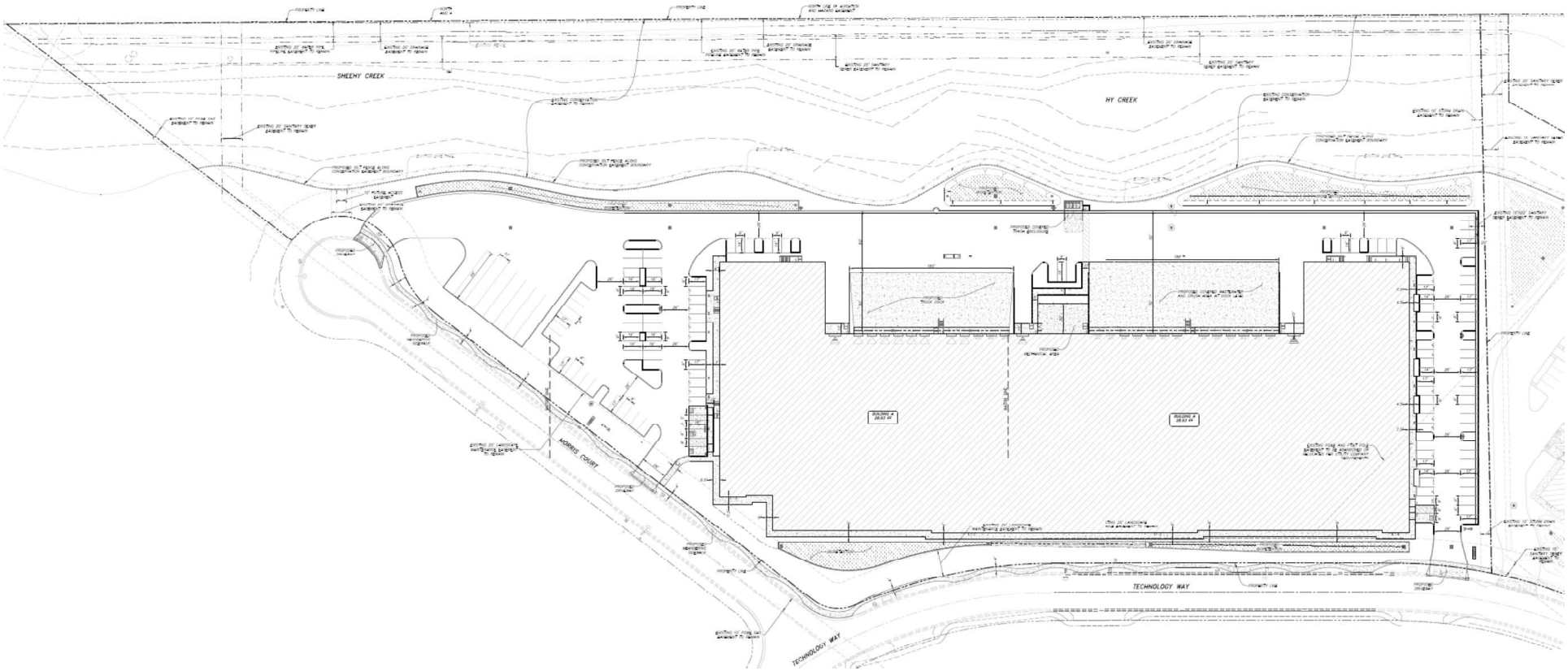
Trip Generation

The anticipated trip generation for Project 1 was estimated using the Napa County Winery Trip Generation Worksheet, a copy of which is provided in Appendix C. Based on output from this worksheet, the proposed winery project would be expected to generate an average of 71 trips per day during non-harvest months, including 23 weekday p.m. peak hour trips. During harvest season the winery would be expected to generate 104 daily trips, with 34 weekday peak hour trips. It was assumed that the a.m. weekday peak hour trips would be approximately the same as the p.m. trips. These results are summarized in Table 2.

Table 2 – Winery Trip Generation Summary (Project 1)

Land Use	Units	Weekday Daily Trips	Weekday Peak Hour Trips	In	Out
Non-Harvest	450,000 gal	71	23	6	17
Harvest	450,000 gal	104	34	8	26

The anticipated trip generation for Project 2 was estimated using standard rates published by the Institute of Transportation Engineers (ITE) in *Trip Generation Manual*, 11th Edition, 2021, for Warehousing (LU #150). Based on the application of these rates, the proposed warehouse project would be expected to generate an average of 114 trips per day, including 11 a.m. peak hour trips and 12 trips during the p.m. peak hour. These results are summarized in Table 3.



Source: RMW Architecture Interiors 8/16

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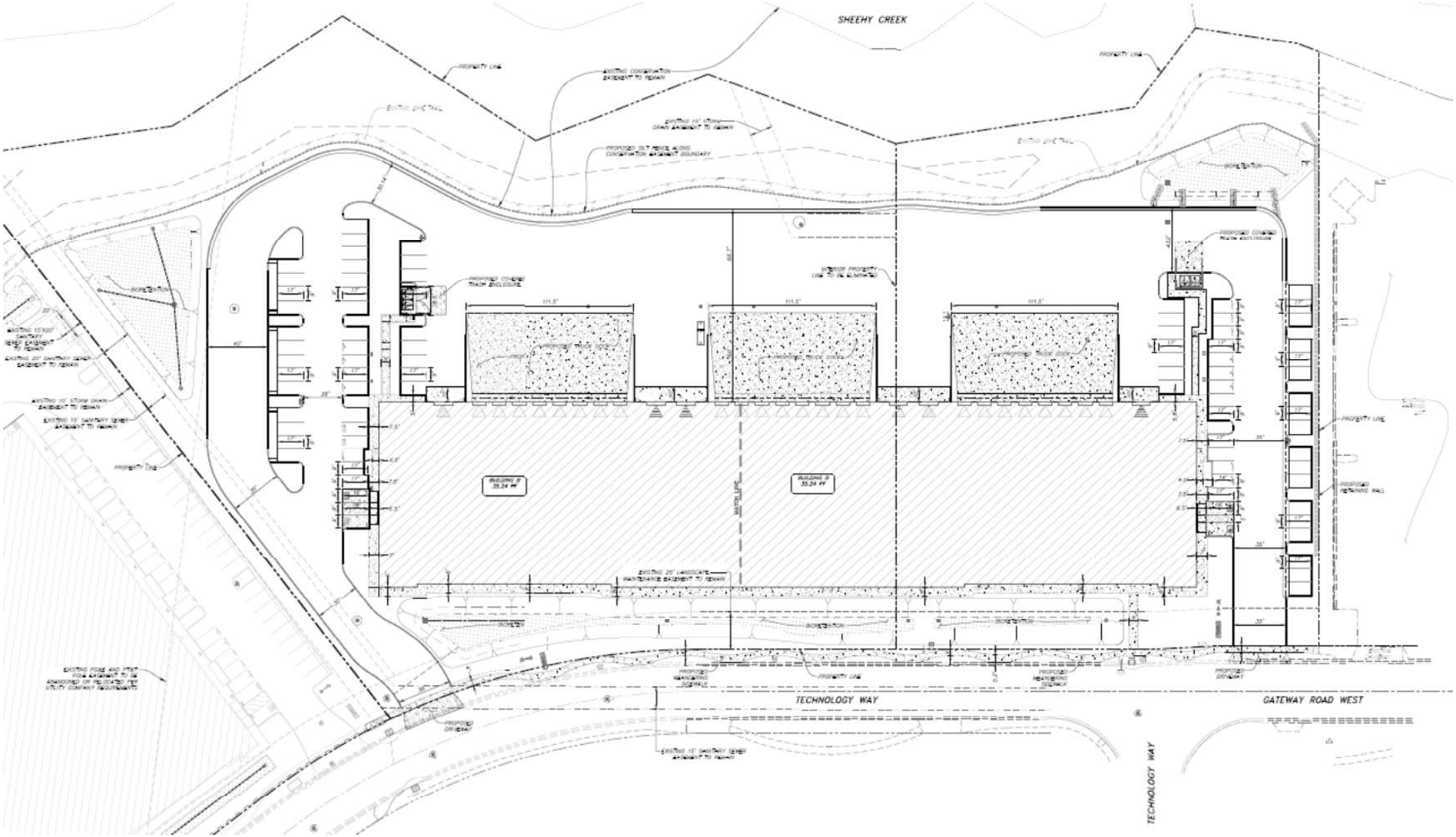
Transportation Impact Study for a Winery and Warehouse at the Napa Airport Business Park

Figure 2 – Winery Site Plan



Source: RMW Architecture Interiors 8/16

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Figure 3 – Warehouse Site Plan

Table 3 – Warehouse Trip Generation Summary (Project 2)											
Land Use	**Units**	**Daily**		**AM Peak Hour**				**PM Peak Hour**			
		Rate	**Trips**	**Rate**	**Trips**	**In**	**Out**	**Rate**	**Trips**	**In**	**Out**
Warehousing	66.915 ksf	1.71	114	0.17	11	9	2	0.18	12	3	9

Note: ksf = 1,000 square feet

Trip Distribution

The pattern used to allocate new project trips to the street network was determined based on employment patterns for residents of Napa County as indicated by the 2000 Census as well as the shortest route to the regional roadways system. Based on these parameters, 50 percent of trips were routed on SR 12-29 from/to the north and 50 percent from/to the south on SR 29. All trips going north and south were distributed through the intersection of SR 12-29/Airport Boulevard in order to represent a more conservative analysis of existing and future conditions.

Circulation System

This section addresses the first transportation bullet point on the CEQA checklist, which relates to the potential for a project to conflict with a program, plan, ordinance, or policy addressing the circulation system, including transit, roadway, bicycle, and pedestrian facilities.

Pedestrian Facilities

Existing and Planned Pedestrian Facilities

Pedestrian facilities include sidewalks, crosswalks, pedestrian signal phases, curb ramps, curb extensions, and various streetscape amenities such as lighting, benches, etc. In general, a network of sidewalks provide access for pedestrians in the vicinity of the proposed project site; however, sidewalk gaps can be found along all of the roadways connecting to the project site. Existing gaps and obstacles along the connecting roadways impact convenient and continuous access for pedestrians and present potential safety concerns in those locations where appropriate pedestrian infrastructure would address potential conflict points.

- **Technology Way** – Sidewalks are provided on the entirety of the inner circle of Technology Way and are provided on the outer circle between Technology Court and Alexis Court as well as between Gateway Drive and Gateway Road West with a small gap in the middle. Marked crosswalks do not exist at any of the intersections with Technology Way.
- **Devlin Road** – Within the project vicinity, sidewalk coverage is provided along the majority of Devlin Road with gaps to the north of Gateway Road West.
- **Airport Boulevard** – Sidewalks are provided on the south side of Airport Boulevard between Gateway Drive-Sena Street and the driveway east of Devlin Road.
- **Project Site 1** – Sidewalks are proposed along the project frontages on the north side of Technology Way and the east side of Morris Court.
- **Project Site 2** – Sidewalks are proposed along the project frontage on the north side of Technology Way.

Pedestrian Safety

The collision history for the study area was reviewed to determine any trends or patterns that may indicate a safety issue for pedestrians. Collision records available from the California Highway Patrol as published in their Statewide Integrated Traffic Records System (SWITRS) reports were reviewed for the most current five-year period available, which was January 1, 2018, through December 31, 2022, at the time of the analysis. During the five-year study period there were no reported collisions involving pedestrians at the study intersections.

Project Impacts on Pedestrian Facilities

Given that there are a limited number of residential land uses within the proximity of the site and the semi-rural location of the site, it is reasonable to assume that project employees would not walk to or from the proposed project site. However, some may wish to walk between the site and the nearby commercial sites.

Project Site – Sidewalks currently exist on the south side of Technology Way and do not currently exist along the project frontages. However, sidewalks are proposed to be built on the north side of Technology Way and east side of Morris Court as part of the proposed projects.

Finding – Pedestrian facilities serving the project sites are considered adequate for the semi-rural location and the projects would provide sidewalks along their frontages as required per County policy.

Bicycle Facilities

Existing and Planned Bicycle Facilities

The *Highway Design Manual*, Caltrans, 2020, classifies bikeways into four categories:

- **Class I Multi-Use Path** – a completely separated right-of-way for the exclusive use of bicycles and pedestrians with cross flows of motorized traffic minimized.
- **Class II Bike Lane** – a striped and signed lane for one-way bike travel on a street or highway.
- **Class III Bike Route** – signing only for shared use with motor vehicles within the same travel lane on a street or highway.
- **Class IV Bikeway** – also known as a separated bikeway, a Class IV Bikeway is for the exclusive use of bicycles and includes a separation between the bikeway and the motor vehicle traffic lane. The separation may include, but is not limited to, grade separation, flexible posts, inflexible physical barriers, or on-street parking.

In the project area, Class II bike lanes exist on Devlin Road between Soscol Ferry Road and Airport Boulevard, on SR 12 (Jameson Canyon Road) east of SR 29 (Napa-Vallejo Highway), and on Airport Boulevard between North Airport Road and SR 29. Bicycle facilities are not proposed anywhere within the project vicinity according to the *Napa Countywide Bicycle Plan,* 2019. Bicyclists ride in the roadway and/or on sidewalks along all other streets within the project study area.

Bicyclist Safety

Collision records for the study area were reviewed to determine if there had been any bicyclist-involved crashes. During the five-year study period between January 1, 2018, through December 31, 2022, there was no reported collision involving a bicyclist at any of the study intersections.

Project Impacts on Bicycle Facilities

Existing bicycle facilities in the projects' vicinity provide adequate access for bicyclists. The project would not preclude any planned future facilities, so is consistent with the County's plans.

Bicycle Storage

Neither project site plan identifies the provision of bicycle parking or storage facilities. According to Chapter 18.110.040 of the Napa County Municipal Code, ten (10) bicycle parking spaces are required for all nonresidential uses requiring more than ten automobile parking spaces. Therefore, a minimum of ten bicycle parking spaces are required for each project. Half of these spaces must be covered since the automobile parking requirement is more than 20 spaces.

Finding – Bicycle facilities serving the project sites would be adequate if a minimum of ten (10) bicycle parking spaces are provided for each project.

Recommendation – Provide a minimum of ten (10) bicycle parking spaces for each project, with at least five of these spaces being covered.

Transit Facilities

Existing Transit Facilities

Napa Valley Transportation Agency (NVTA) Vine Transit provides fixed route bus service in Napa County and nearby areas. Route 11 provides loop service to destinations between Napa and Vallejo and stops at Devlin Road/Gateway Road. Route 11 operates with approximately one-hour headways between 6:30 a.m. and 9:25 p.m. on weekdays and between 8:45 a.m. and 9:15 p.m. on weekends.

Two to three bicycles can be carried on all NVTA buses. Bike rack space is on a first come, first served basis and riders are responsible for loading and unloading their bicycles.

Dial-a-ride, also known as paratransit or door-to-door service, is available for those who are unable to independently use the transit system due to a physical or mental disability. NVTA VineGo Paratransit Service is designed to serve the needs of individuals with disabilities and provides transportation curb to curb within three-quarters of a mile from a fixed route system.

Impact on Transit Facilities

The existing transit route is adequate to accommodate project-generated transit trips, though there may be a limited number of them. The existing bus stops are within an acceptable walking distance of the site, and continuous pedestrian access to the bus stops would exist with the construction of sidewalks as part of the two projects.

Finding – Transit facilities serving the project site are considered adequate for the semi-rural location. The project would not conflict with any policies or plans for transit service.

Significance Finding – The proposed projects would have a less-than-significant impact on pedestrian, bicycle, and transit trips as they would provide sidewalks along their frontages, so would not conflict with any policies for these modes.

Vehicle Miles Traveled (VMT)

The potential for the project to conflict or be inconsistent with CEQA Guidelines § 15064. 3, subdivision (b) was evaluated based on the project's anticipated Vehicle Miles Traveled (VMT).

Senate Bill (SB) 743 established the increase in Vehicle Miles Traveled (VMT) as a result of a project as the basis for determining impacts with respect to transportation under the California Environmental Quality Act (CEQA). Local agencies have the authority to adopt thresholds of significance for CEQA analysis, and the County of Napa has developed guidance for VMT analysis that has been published in the document *Napa County Traffic Impact Study (TIS) Guidelines*, February 2020. According to the County guidelines, if a project would generate more than 110 net new daily passenger vehicle trips, a VMT analysis is required to determine if the project causes a significant environmental impact as defined by General Plan Policy CIR-7. For all land use types, if a significant VMT impact is identified, feasible mitigation measures must be identified to reduce the project's VMT by at least 15 percent for the impact to be considered less than significant. The recommended significance threshold represents a 15 percent reduction in VMT compared to unmitigated VMT as estimated using standard ITE trip generation rates or County-approved rates from its trip generation worksheet that is used for analyzing winery projects. Because Project 1 would generate fewer than 110 daily trips, it would be presumed to have a less-than-significant VMT impact and does not require a quantitative analysis or mitigation.

It is noted that as defined in Section 15064.3 of the CEQA guidelines, VMT is defined for CEQA purposes as the "amount and distance of automobile travel attributable to a project". As further described in *Technical Advisory on Evaluating Transportation Impacts Under CEQA*, 2018, published by the Governor's Office of Planning and Research, (OPR), this includes only miles driven by automobile and light duty trucks, and does not consider travel associated with heavy trucks.

Napa County's guidelines further state that the most appropriate metric for assessing project impacts is total VMT, which includes VMT produced by all project-related passenger vehicle trips. To establish a baseline, the guidelines indicate that project-related VMT should be estimated by multiplying the number of project-generated trips by the countywide average trip length as determined in the *Napa Valley Travel Behavior Study*, March 2020, which is 11.8 miles. Assuming an average trip length of 11.8 miles, the warehouse is estimated to generate 114 trips and 1,345 VMT per day. The results of these calculations are summarized in Table 4.

Table 4 – Vehicle Miles Traveled (VMT) Estimate for Project 2

Proposed Land Use	Average Daily Trips	Project VMT (average trip length = 11.8 miles)
Project 2 (Warehouse)	114	1,345

As noted, in accordance with County policy, the number of project trips would need to be reduced by at least 15 percent, or 202 VMT per day for the warehouse project, for the VMT impacts to be considered less than significant.

Potential Employee TDM Measures

Transportation Demand Management (TDM) measures aim to reduce single-occupant vehicle trips, parking demand, and total vehicle miles traveled (VMT) through use of alternative modes of transportation and/or more efficiently planned trips. The County policy includes recommended TDM measures for use in winery and other projects, although it indicates that additional measures may be recommended if determined to be appropriate for the project and can be demonstrated to be feasible.

The project's TDM Program should provide information, encouragement, and access to non-motorized travel options to reduce the number of vehicle trips, shifting these trips to other modes and thus reducing VMT. The following measures are quantifiable strategies intended to reduce the project's employee-based VMT. A TDM plan specific to future uses would need to be designed and implemented by future tenants of the project space.

Commute Trip Reduction Program

A voluntary commute trip reduction program encourages alternative modes of transportation such as carpooling, transit, and biking. This program must include employer-provided services, infrastructure, and incentives for alternative modes, discounted transit, bicycling, vanpool, and guaranteed ride home. Additionally, information, coordination, and marketing for services, infrastructure, and incentives must be provided.

Rideshare Program

Providing a rideshare program would encourage carpooled vehicle trips over single-occupant vehicle trips. This should be promoted through a multi-faceted approach, which could include designating a certain percentage of desirable parking spaces for ridesharing vehicles or providing an app or website for coordinating rides.

Tele-Work/Compressed/Flex Schedules

Telework (i.e., working from home), compressed schedules (i.e., working more than eight hours each day and shortening the work week), and flex schedules (i.e., varying arrival and departure times to avoid peak commute hours) are three of the most commonly-employed scheduling options used to reduce vehicle trips. They are effective at reducing vehicle trips to work, particularly during peak commute hours. Employee work hours could be staggered to reduce congestion during peak traffic hours.

End-of-Trip Bicycle Facilities

Bicycle Parking

The provision of both short-term and long-term bicycle parking is important for encouraging employees to commute by bicycle. Secure long-term parking (e.g., bike lockers) is often a critical component in encouraging employees to bike to work as the lack of secure parking is often cited by employees as a deterrent to doing so. Short-term parking (e.g., bike racks) could be used by employees and is generally an inexpensive way to accommodate visitors as well.

According to the Napa County Municipal Code Section 18.110.040, all nonresidential uses are required to provide at least ten bicycle parking spaces if the number of automobile parking spaces required is more than ten. Therefore, a minimum of ten bicycle racks should be provided for each project.

Bicycle Maintenance Tools

In addition to providing bicycle parking, some businesses are now encouraging bicycle use by providing employees and visitors with the basic tools necessary to maintain their bicycles on site. Often, these tools can be kept in bicycle storage areas and include simple items such as a bike pump and tire patches that are essential, yet inexpensive, for bike travel.

Employee VMT Reduction

The expected VMT reductions associated with the various TDM measures identified were estimated based on information published in the California Air Pollution Officers Association (CAPCOA) report *Handbook for Analyzing GHG Emission Reductions, Assessing Climate Vulnerabilities, and Advancing Health and Equity*, CAPCOA, 2022, and the Napa Mobility Management VMT Reduction Calculator Tool, which supports the goals of SB 743, as well as the location of the project site and knowledge of transportation characteristics of the area. The TDM strategies listed above are projected to result in a VMT reduction of 15 percent, accounting for the potentially overlapping effects of each strategy. The estimated VMT reduction calculations are summarized in Table 5.

Table 5 – Estimated Employee VMT Reduction

TDM Measure	Project VMT % Reduction Estimate
Commute Trip Reduction Program	4.0
Ridesharing Program	4.0
Telework/Compressed/Flex Schedules	5.9
Provide End-of-Trip Bicycle Facilities	2.7
Total Potential VMT Reduction	16.6
Adjusted to Account for Combined Measures	**15.0**

Notes: TDM = transportation demand management; VMT = vehicle miles traveled

Significance Finding – Project 1 would generate fewer than 110 daily trips and can be presumed to have a less-than-significant VMT impact. The warehouse project could achieve a less-than-significant impact on VMT if appropriate TDM measures are implemented.

Mitigation Measure – Future tenants of Project 2 should prepare a TDM plan specific to their use that achieves the 15-percent reduction in vehicle travel required. The plan would need to be reviewed and approved by the County.

Safety Issues

The potential for the project to impact safety was evaluated in terms of the adequacy of sight distance and need for turn lanes at the project accesses as well as the adequacy of stacking space in dedicated turn lanes at the study intersections to accommodate additional queuing due to adding project-generated trips and need for additional right-of-way controls. This section addresses the third transportation bullet on the CEQA checklist which is whether or not the project would substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses.

Site Access

Both projects would be accessed via new driveways located on the southern property lines. All trucks would be able to loop around the buildings on-site and exit at a second driveway on the west side of the buildings.

Sight Distance

Sight distance along Technology Way at both project driveways was evaluated based on sight distance criteria contained in the *Highway Design Manual* published by Caltrans. The recommended sight distance private driveways is based on stopping sight distances with the approach travel speeds used as the basis for determining the recommended sight distance. Additionally, the stopping sight distance needed for a following driver to stop if there is a vehicle waiting to turn into a side street or driveway was evaluated based on stopping sight distance criteria and the approach speed on the major street. Field measurements were obtained at the proposed driveway locations, and based on a design speed of 25 mph, the minimum stopping sight distance needed is 150 feet. Both project driveways have sufficient sight distance in both directions.

Proposed landscaping within the vision triangle at each driveway should consist of either low-lying (three feet high or less) or trees with all branches trimmed to a minimum height of seven feet above the roadway elevation to avoid introducing any impediments to sight distance.

Access Analysis

Left-Turn Lane Warrants

The need for left-turn channelization in the form of a left-turn pocket on Technology Way at each project driveway was evaluated using the criteria published by the County in the *Napa County Road and Street Standards*, February 4, 2020. The roadway ADT was estimated by converting the p.m. peak hour turning movement counts at Devlin Road/Gateway Road to segment volumes and multiplying by 10, a common practice when only peak hour volumes are available. This results in an estimated average daily traffic volume of 880 vehicles on Gateway Road west of Devlin Road. While some of the volume entering and exiting Gateway Road from Devlin Road would be associated with other nearby uses along Technology Way between Devlin Road and the project sites and therefore not be present at the driveway locations, the total volume in and out of Gateway Road at Devlin Road was conservatively used along with the higher of the daily trip generations for the two projects. Based on the derived existing volumes, left-turn lanes are not warranted on Technology Way at either of the proposed driveways for the two projects. The turn lane warrant graph is provided in Appendix D.

Queuing

The County of Napa does not prescribe thresholds of significance regarding queue lengths. The change in queuing would be considered a potentially significant impact if the increase would cause the queue to extend out of a dedicated turn lane into a through traffic lane, or the back of queue into a visually restricted area, such as a blind corner or an adjacent intersection. If queues would already be expected to extend past a dedicated turn lane or into a visually restricted area without project traffic, the lengthening of the queue due to project traffic so that it would exceed a second threshold was considered to constitute a potentially significant impact.

Unsignalized Intersection

Eastbound left-turn storage at Devlin Road/Gateway Road was determined using the "Two-Way Stop-Controlled" methodology contained in *Highway Capacity Manual* (HCM), Transportation Research Board, 6th Edition. Maximum queue lengths were estimated by assuming vehicle lengths of 25 feet and multiplying that by the number of vehicles expected to queue. These queuing results are included with the Level of Service calculations in Appendix E. Under future volumes with the addition of traffic from both projects, which represents the worst-case condition, a maximum of three vehicles would be expected to queue in the eastbound left-turn lane during the p.m. peak hour, which represents a maximum queue of approximately 75 feet. A maximum of one vehicle would be expected to queue in the northbound left-turn lane during either peak hour. This is less than the eastbound and northbound left-turn storage lengths of 160 feet and 175 feet, respectively. Therefore, there is adequate vehicle storage space.

Finding – Adequate left- and right-turn vehicle storage space is available at Devlin Road/Gateway Road.

Signalized Intersections

Under each scenario, the projected maximum queues in left-turn pockets at the study intersections were determined using the SIMTRAFFIC application of the Synchro traffic analysis software and averaging the maximum projected queue for each of five runs. Summarized in Table 6 are the predicted queue lengths for all dedicated turn lanes at the two signalized study intersections under existing volumes, with each project added individually and with both projects. Copies of the SIMTRAFFIC projections are contained in Appendix F.

Table 6 – Maximum Queues at Signalized Intersections for Existing Scenarios									
Study Intersection Approach	**Available Storage[1]**	**Maximum Queues**							
		AM Peak Hour				**PM Peak Hour**			
		E	**E+P1**	**E+P2**	**E+P1&2**	**E**	**E+P1**	**E+P2**	**E+P1&2**
Devlin Rd/Airport Blvd									
NB Left Turn	110	53	45	44	57	16	19	17	19
NB Through/Right Turn	380	136	141	134	139	65	65	66	62
EB Left Turn	300	30	32	31	31	63	64	63	61
WB Left Turn	370	102	103	102	109	56	55	54	57
SR 12-29/Airport Blvd									
NB Left Turn	870	230	238	243	249	68	83	79	85
NB Right Turn	220	96	118	102	100	167	151	182	138
SB Left Turn	1450[2]	1304	1307	1273	1182	**1986**	**2070**	**2016**	**1739**
EB Left Turn	310	80	84	76	87	**364**	**367**	**344**	**363**
EB Right Turn	315	12	21	21	20	**399**	**379**	**365**	**389**
WB Left Turn	195	**210**	177	188	**196**	84	88	86	92

Notes: Maximum Queue based on the average of 95th-percentile from ten SIMTRAFFIC runs; all distances are measured in feet; E = Existing Conditions; E+P1 = Existing plus Project 1 Conditions; E+P2 = Existing plus Project 2 Conditions; E+P1+P2 = Existing plus Project 1 and 2 Conditions; **Bold** text = queue length exceeds available storage; [1]storage lengths were measured using Google Maps; [2]storage length modeled as unlimited due to Synchro limitations

At SR 12-29/Airport Boulevard, turn queues are expected to exceed existing storage capacity at four locations: in the southbound left-turn, eastbound left-turn, and eastbound right-turn lanes for all scenarios during the p.m. peak hour, and in the westbound left-turn lane during the a.m. peak hour under Existing and Existing plus Project 1 and 2 conditions only. As the addition of project traffic does not cause any of the analyzed queues to extend beyond the available stacking space that would not do so without each project, the effect on queuing is less than significant.

The queuing results under future volumes and with one or both projects are shown in Table 7.

Table 7 – Maximum Left-Turn Queues at Signalized Intersections for Future Scenarios									
Study Intersection Approach	**Available Storage[1]**	**Maximum Queues**							
		AM Peak Hour				**PM Peak Hour**			
		F	**F+P1**	**F+P2**	**F+P1&2**	**F**	**F+P1**	**F+P2**	**F+P1&2**
Devlin Rd/Airport Blvd									
NB Left Turn	110	69	72	72	68	19	20	19	19
NB Through/Right Turn	380	181	177	183	178	79	82	78	82
EB Left Turn	300	37	35	33	32	77	85	74	76
WB Left Turn	370	114	116	122	118	60	65	67	56
SR 12-29/Airport Blvd									
NB Left Turn	870	341	321	343	307	427	330	280	314
NB Right Turn	220	196	202	190	185	**260**	**244**	**260**	**263**
SB Left Turn	1450[2]	**4565**	**4606**	**4572**	**4548**	**4750**	**4721**	**4700**	**4703**
EB Left Turn	310	89	100	98	98	**410**	**403**	**407**	**403**
EB Right Turn	315	24	24	23	43	**470**	**460**	**467**	**468**
WB Left Turn	195	**204**	178	**203**	**196**	108	101	102	103

Notes: Maximum Queue based on the average of 95th-percentile from ten SIMTRAFFIC runs; all distances are measured in feet; F = Future Conditions; F+P1 = Future plus Project 1 Conditions; F+P2 = Future plus Project 2 conditions; F+P1+P2 = Future plus Project 1 and 2 Conditions; **Bold** text = queue length exceeds available storage; [1]storage lengths were measured using Google Maps; [2]storage length modeled as unlimited due to Synchro limitations

Under the future scenarios, queueing at SR 12-29/Airport Boulevard is expected to exceed existing capacity in the northbound right-turn, eastbound left-turn, and eastbound right-turn lanes for all p.m. peak hour scenarios. Additionally, queueing in the southbound left-turn lane is expected to exceed capacity for all scenarios evaluated, and queuing in the westbound left-turn lane is expected to exceed capacity under Future, Future plus Project 2, and Future plus Project 1 and 2 Conditions during the a.m. peak hour.

Finding – The project does not cause any queues to exceed available storage that would not do so without the project, so the impact is considered less than significant.

Emergency Access

The final transportation bullet on the CEQA checklist requires an evaluation of whether the project would result in inadequate emergency access.

Adequacy of Site Access

Both projects would be accessed via new driveways on the east side of each project site. The winery would be accessed via Technology Way, while the warehouse would be accessed via Gateway Road West, directly east of Technology Way. Emergency vehicles would be able to loop around the building and exit at driveways located on the west side of each project. The western driveway for the winery would be on Morris Court.

Section 104.2 of the California Fire Code requires buildings exceeding 62,000 square feet in area to have two separate and approved fire apparatus access roads. Fire apparatus would be able to access the projects from both the entering and exit driveways, so California Fire Code Standards are met. Fire vehicle access is illustrated in Appendix G.

Off-Site Impacts

While the project would be expected to result in slight increases in delay for traffic in the surrounding vicinity, emergency response vehicles can claim the right-of-way by using their lights and sirens; therefore, the project would be expected to have a nominal effect on emergency response times.

Significance Finding – The proposed projects would be designed to accommodate emergency response vehicles and would not impede access for emergency responders. It would therefore have a less-than-significant impact on emergency response.

Capacity Analysis

Intersection Level of Service Methodologies

Level of Service (LOS) is used to rank traffic operation on various types of facilities based on traffic volumes and roadway capacity using a series of letter designations ranging from A to F. Generally, Level of Service A represents free flow conditions and LOS F represents forced flow or breakdown conditions. A unit of measure that indicates a level of delay generally accompanies the LOS designation.

The study intersections were analyzed using methodologies published in the HCM 6th Edition. This source contains methodologies for various types of intersection control, all of which are related to a measurement of delay in average number of seconds per vehicle. Peak Hour Factors (PHF) as determined by the traffic counts were used for Existing Conditions scenarios, while a PHF of 0.95 was applied for all Future Conditions scenarios. Heavy vehicle percentages were assumed to be five percent for each movement under existing and future conditions in accordance with Napa County policy.

The Levels of Service for the intersection of Devlin Road/Gateway Road, which is unsignalized with two-way stop control on Gateway Road, were analyzed using the "Two-Way Stop-Controlled" intersection capacity method from the HCM. This methodology determines a level of service for each minor turning movement by estimating the level of average delay in seconds per vehicle. Results are presented for individual movements together with the weighted overall average delay for the intersection.

The remaining study intersections were evaluated using the signalized methodology from the HCM. This methodology is based on factors including traffic volumes, green time for each movement, phasing, whether the signals are coordinated or not, truck traffic, and pedestrian activity. Average stopped delay per vehicle in seconds is used as the basis for evaluation in this LOS methodology. For purposes of this study, delays were calculated using signal timing obtained from Napa County and Caltrans.

The ranges of delay associated with the various levels of service are indicated in Table 8.

Table 8 – Intersection Level of Service Criteria		
LOS	**Two-Way Stop-Controlled**	**Signalized**
A	Delay of 0 to 10 seconds. Gaps in traffic are readily available for drivers exiting the minor street.	Delay of 0 to 10 seconds. Most vehicles arrive during the green phase, so do not stop at all.
B	Delay of 10 to 15 seconds. Gaps in traffic are somewhat less readily available than with LOS A, but no queuing occurs on the minor street.	Delay of 10 to 20 seconds. More vehicles stop than with LOS A, but many drivers still do not have to stop.
C	Delay of 15 to 25 seconds. Acceptable gaps in traffic are less frequent, and drivers may approach while another vehicle is already waiting to exit the side street.	Delay of 20 to 35 seconds. The number of vehicles stopping is significant, although many still pass through without stopping.
D	Delay of 25 to 35 seconds. There are fewer acceptable gaps in traffic, and drivers may enter a queue of one or two vehicles on the side street.	Delay of 35 to 55 seconds. The influence of congestion is noticeable, and most vehicles have to stop.
E	Delay of 35 to 50 seconds. Few acceptable gaps in traffic are available, and longer queues may form on the side street.	Delay of 55 to 80 seconds. Most, if not all, vehicles must stop, and drivers consider the delay excessive.
F	Delay of more than 50 seconds. Drivers may wait for long periods before there is an acceptable gap in traffic to exit the side streets, creating long queues.	Delay of more than 80 seconds. Vehicles may wait through more than one cycle to clear the intersection.

Reference: *Highway* Capacity *Manual,* Transportation Research Board, 6th Edition

Traffic Operation Standards

Napa County

In the Circulation Element of the *Napa County General Plan*, the following policies have been adopted:

- **Policy CIR-31** – The County seeks to provide a roadway system that maintains current roadway capacities in most locations and is efficient in providing local access.

- **Policy CIR-38** – The County seeks to maintain operations of roads and intersections in the unincorporated County area that minimize travel delays and promote safe access for all users. Operational analysis shall be conducted according to the latest version of the Highway Capacity Manual and as described in the current version of the County's Transportation Impact Study Guidelines. In general, the County seeks to maintain Level of Service (LOS) D on arterial roadways and at signalized intersections, as the service level that best aligns with the County's desire to balance its rural character with the needs of supporting economic vitality and growth.

  In situations where the County determines that achieving LOS D would cause an unacceptable conflict with other goals and objectives, minimizing collisions and the adequacy of local access will be the County's priorities. Mitigating operational impacts should first focus on reducing the project's vehicular trips through modifying the project definition, applying TDM strategies, and/or applying new technologies that could reduce vehicular travel and associated delays; then secondarily should consider physical infrastructure changes. Proposed mitigations will be

evaluated for their effect on collisions and local access, and for their effectiveness in achieving the maximum potential reduction in the project's operational impacts (see the County's Transportation Impact Study Guidelines for a list of potential mitigation measures).

The following roadway segments are exceptions to the LOS D standard described above:

- *State Route 29 in the unincorporated areas between Yountville and Calistoga: LOS F is acceptable.*
- *Silverado Trail between State Route 128 and Yountville Cross Road: LOS E is acceptable.*
- *State Route 12/121 between the Napa/Sonoma county line and Carneros Junction: LOS F is acceptable.*
- *American Canyon Road from I-80 to American Canyon City Limit: LOS E is acceptable.*

To provide a more quantitative method of adhering to the above standards, the County establishes thresholds of significance for road segments and different intersection control types in the *Napa County Traffic Impact Study Guidelines,* 2021. The memorandum states a project would cause a significant impact requiring mitigation if for existing conditions:

- A signalized intersection operates at LOS A, B, C, or D during the selected peak hours without Project trips, and the LOS deteriorates to LOS E or F with the addition of Project trips; or
- A signalized intersection operates at LOS E or F during the selected peak hours without Project trips, and the addition of Project trips increases the total entering volume by one percent or more.
    - *Project Contribution % = Project Trips ÷ Existing Volumes*
- An unsignalized intersection operates at LOS A, B, C, or D during the one or more peak hours without Project trips, and the LOS deteriorates to LOS E or F with the addition of Project traffic; the peak hour traffic signal warrant criteria should also be evaluated; or
- An unsignalized intersection operates at LOS E or F during one or more peak hours without Project trips, and the Project would increase delay by five seconds or more; the peak hour traffic signal warrant should also be evaluated.
    - *<u>All-Way Stop-Controlled Intersections</u> – increase in delay should be calculated based on the overall average delay.*
    - *<u>Side-Street Stop-Controlled Intersections</u> – increase in delay should be calculated based on the delay for the worst approach(es). Each stop-controlled approach that operates at LOS E or F should be analyzed individually.*
- An arterial segment operates at LOS A, B, C or D during the selected peak hours without Project trips, and deteriorates to LOS E or F with the addition of Project trips; or
- An arterial segment operates at LOS E or F during the selected peak hours without Project trips, and the addition of Project trips increases the total segment volume by one percent or more. The following equation should be used if the arterial segment operates at LOS E or F without the Project:
    - *Project Contribution % = Project Trips ÷ Existing Volumes*

- Cumulative Conditions – A Project's contribution to a substantial cumulative effect would be considerable if it is equal to or greater than five percent to total growth in traffic at failing intersections. The following equation should be used to evaluate the project:

    - *Project Contribution % = Project Trips ÷ Growth between Existing and Cumulative Value*

Significance threshold for failing intersections: General Plan policy accepts LOS E and F in certain instances. If an unsignalized intersection is operating acceptably (LOS A through D), and the project would cause the intersection to fall to LOS E or F, the applicant must mitigate the adverse impact to restore to LOS D at minimum, or the project is considered to adversely impact the intersection. If an intersection is already LOS E or F, and the project would increase delay by five or more seconds, the applicant must mitigate the impact to lower the increase in delay, or else the project would be considered to adversely impact the intersection. The same standards apply to the analysis of minor approaches to unsignalized intersections. As CEQA Guidelines shift away from LOS and toward VMT as the determining factor in identifying significant transportation impacts, adverse effects to intersections may still be the basis for conditioning transportation improvements to improve or maintain existing LOS or denying a project for the project's potentially negative impacts to public safety (use permit finding).

Caltrans

Caltrans does not have a standard of significance relative to operation as this is no longer a CEQA issue. The *Vehicle Miles Traveled-Focused Transportation Impact Study Guide* (TISG), published in May 2020, replaced the *Guide for the Preparation of Traffic Impact Studies*, 2002. As indicated in the TISG, the Department is transitioning away from requesting LOS or other vehicle operations analyses of land use projects and instead focuses on Vehicle Miles Traveled (VMT). The County's standards for signalized intersections were therefore applied to SR 12-29/Airport Boulevard.

Existing Conditions

The Existing Conditions scenario provides an evaluation of current operation based on existing traffic volumes during the a.m. and p.m. peak periods. This condition does not include project-generated traffic volumes. Volume data was collected on Thursday, August 24, 2023, while local schools were in session. Under existing conditions, the approaches at Devlin Road/Gateway Road and the intersection of Devlin Road/Airport Boulevard operate acceptably at LOS D or better, while SR 12-29/Airport Boulevard operates at LOS E and F during the a.m. and p.m. peak hours, respectively. The existing traffic volumes are shown in Figure 4. A summary of the intersection Level of Service calculations is contained in Table 9, and copies of the calculations are provided in Appendix E.

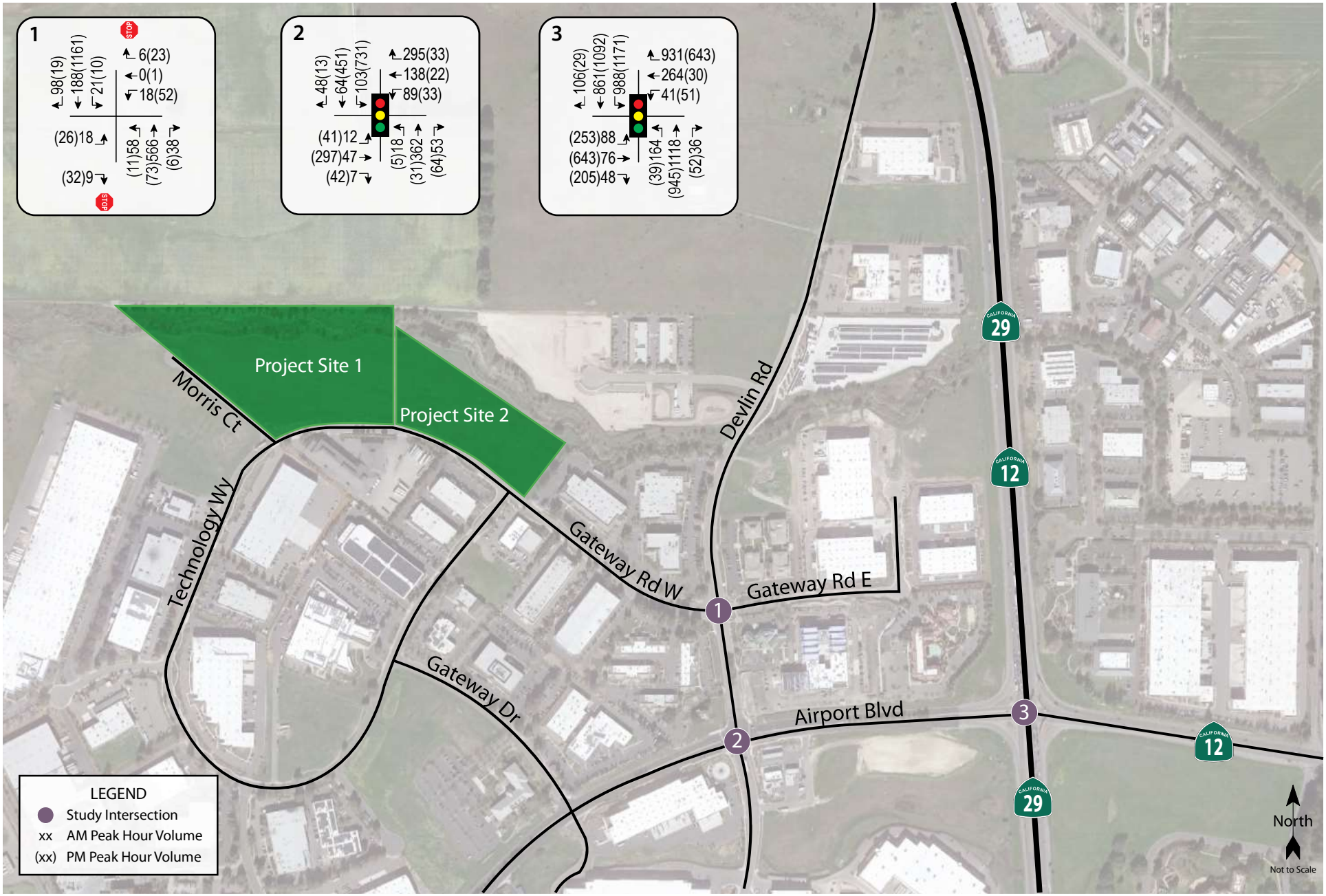

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Figure 4 – Existing Traffic Volumes

Table 9 – Existing Peak Hour Intersection Levels of Service				
Study Intersection ***Approach***	**AM Peak**		**PM Peak**	
	Delay	**LOS**	**Delay**	**LOS**
1. Devlin Rd/Gateway Rd	1.6	A	2.5	A
Eastbound (Gateway Rd) Approach	*16.6*	*C*	*32.1*	*D*
Westbound (Gateway Rd) Approach	*22.9*	*C*	*19.3*	*C*
2. Devlin Rd/Airport Blvd	18.7	B	31.3	C
3. SR 12-29/Airport Blvd	**58.7**	**E**	**111**	**F**

Notes: Delay is measured in average seconds per vehicle; LOS = Level of Service; Results for minor approaches to two-way stop-controlled intersections are indicated in *italics*; **Bold** text = deficient operation

Future Conditions

Year 2040 intersection turning movements were developed by developing an annual growth rate based on 2015 and projected 2040 link volumes for SR 12-29/Airport Boulevard from the Solano-Napa Activity-Based Model. Based on this, 1.28 percent and 1.18 percent annual growth rates were grown to determine a 17-year growth rate, which was then applied to the existing volumes to achieve projected 2040 volumes.

Under the anticipated future volumes, the intersection of Devlin Road/Airport Boulevard is expected to operate acceptably while SR 12-29/Airport Boulevard and the eastbound approach to Devlin Road/Gateway Road are expected to operate deficiently. Future volumes are shown in Figure 5 and operating conditions are summarized in Table 10.

Table 10 – Future Peak Hour Intersection Levels of Service				
Study Intersection ***Approach***	**AM Peak**		**PM Peak**	
	Delay	**LOS**	**Delay**	**LOS**
1. Devlin Rd/Gateway Rd	1.8	A	4.2	A
Eastbound (Gateway Rd) Approach	*19.4*	*C*	***60.9***	***F***
Westbound (Gateway Rd) Approach	*29.5*	*D*	*27.5*	*D*
2. Devlin Rd/Airport Blvd	20.0	B	39.2	D
3. SR 12-29/Airport Blvd	**108**	**F**	**192**	**F**

Notes: Delay is measured in average seconds per vehicle; LOS = Level of Service; Results for minor approaches to two-way stop-controlled intersections are indicated in *italics;* **Bold** text = deficient operation

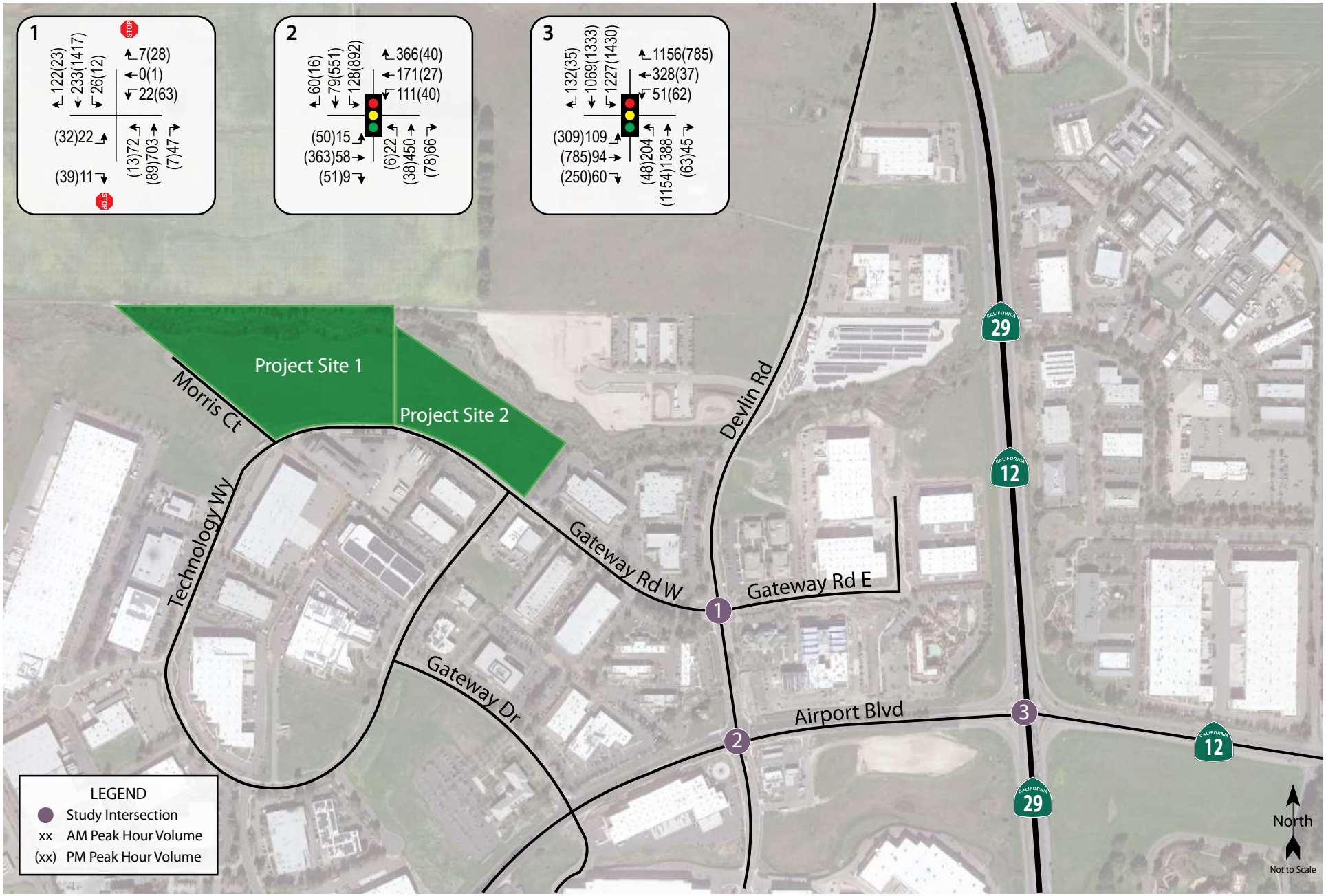

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Figure 5 – Future Traffic Volumes

Project Conditions

Existing plus Project Conditions

Existing plus Project 1

Upon the addition of traffic related to Project 1 to the existing volumes, the study intersections are expected to operate acceptably except for SR 12-29/Airport Boulevard, which would continue operating at LOS E and F. However, as the addition of project trips increases the entering volume by less than one percent, the project would have an acceptable effect on traffic operation. These results are summarized in Table 11. Project 1 traffic volumes are shown in Figure 6 and Existing plus Project 1 volumes are shown in Figure 7.

Table 11 – Existing and Existing plus Project 1 Peak Hour Intersection Levels of Service

Study Intersection *Approach*	Existing Conditions				Existing plus Project 1			
	AM Peak		PM Peak		AM Peak		PM Peak	
	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
1. Devlin Rd/Gateway Rd	1.6	A	2.5	A	1.9	A	3.0	A
EB (Gateway Rd) Approach	*16.6*	*C*	*32.1*	*D*	*13.4*	*B*	*28.0*	*D*
WB (Gateway Rd) Approach	*22.9*	*C*	*19.3*	*C*	*24.4*	*C*	*21.3*	*C*
2. Devlin Rd/Airport Blvd	18.7	B	31.3	C	18.7	B	31.4	C
3. SR 12-29/Airport Blvd	**58.7**	**E**	**111**	**F**	**58.8**	**E**	**113**	**F**

Notes: Delay is measured in average seconds per vehicle; LOS = Level of Service; Results for minor approaches to two-way stop-controlled intersections are indicated in *italics*; **Bold** text = deficient operation

It should be noted that with the addition of project-related traffic volumes, average delay at the eastbound Gateway Road approach to Devlin Road decreases during both peak hours. While this is counter-intuitive, this condition occurs when a project adds trips to movements that are currently underutilized or have delays that are below the intersection average, resulting in a better balance between approaches and lower overall average delay. The project adds traffic to the eastbound right-turn movement, which has an average delay that is lower than the average for the approach, resulting in a slight reduction in the delay. The conclusion could be incorrectly drawn that the project actually improves operation at the approach based on this data alone; however, it is more appropriate to conclude that the project trips are expected to make use of excess capacity, so drivers will experience little, if any, change in conditions as a result of the project.

The addition of project trips increases the entering volume at SR 12-29/Airport Boulevard by less than one percent, so Project 1's effect on operation is considered acceptable.

Existing plus Project 2

Upon the addition of traffic related to Project 2 to the existing volumes, the study intersections are expected to operate acceptably at LOS D or better with the exception of SR 12-29/Airport Boulevard, which would continue to operate at LOS E and F. These results are summarized in Table 12. Project 2 traffic volumes are shown in Figure 6 and Existing plus Project 2 volumes are shown in Figure 7.

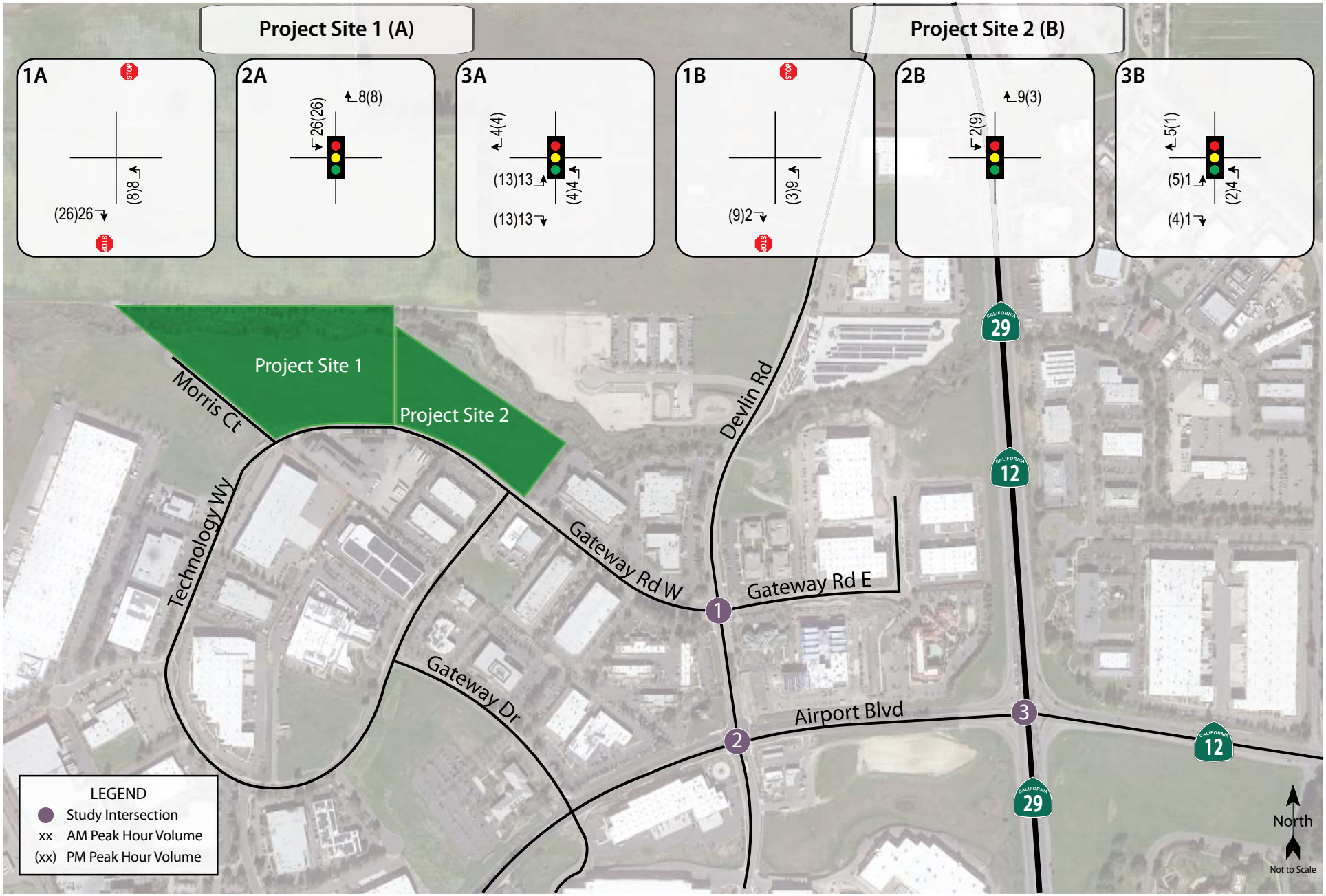

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Figure 6 – Project Traffic Volumes

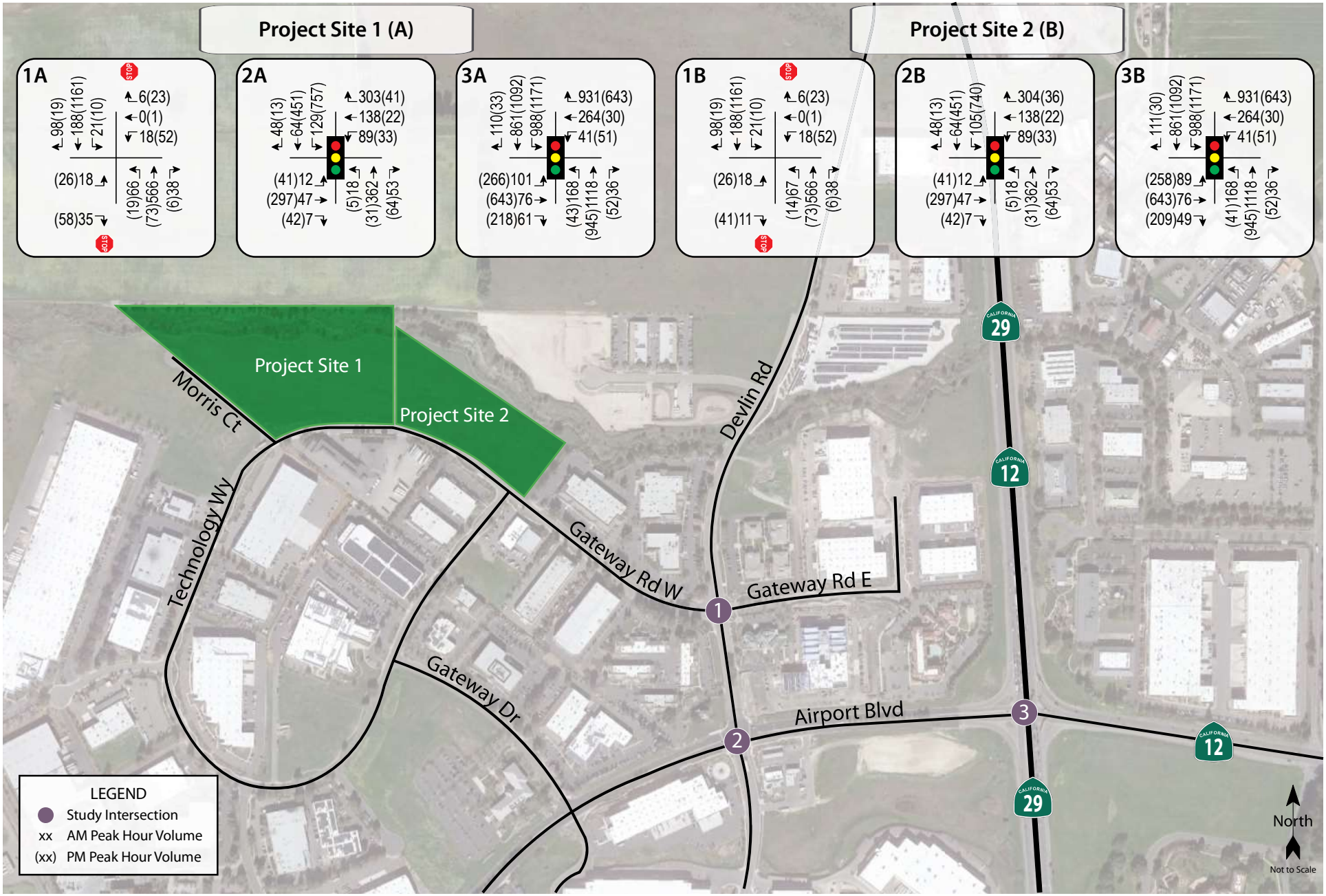

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Figure 7 – Existing plus Project Traffic Volumes

W-Trans

Table 12 – Existing and Existing plus Project 2 Peak Hour Intersection Levels of Service								
Study Intersection ***Approach***	**Existing Conditions**				**Existing plus Project 2**			
	AM Peak		**PM Peak**		**AM Peak**		**PM Peak**	
	Delay	**LOS**	**Delay**	**LOS**	**Delay**	**LOS**	**Delay**	**LOS**
1. Devlin Rd/Gateway Rd	1.6	A	2.5	A	1.7	A	2.7	A
EB (Gateway Rd) Approach	*16.6*	*C*	*32.1*	*D*	*16.5*	*C*	*30.1*	*D*
WB (Gateway Rd) Approach	*22.9*	*C*	*19.3*	*C*	*23.9*	*C*	*19.9*	*C*
2. Devlin Rd/Airport Blvd	18.7	B	31.3	C	18.7	B	31.4	C
3. SR 12-29/Airport Blvd	**58.7**	**E**	**111**	**F**	**58.8**	**E**	**112**	**F**

Notes: Delay is measured in average seconds per vehicle; LOS = Level of Service; Results for minor approaches to two-way stop-controlled intersections are indicated in *italics*; **Bold** text = deficient operation

The addition of project trips at SR 12-29/Airport Boulevard does not increase the entering volumes by more than one percent, so the project would not have an adverse effect on operations.

Existing plus Projects 1 and 2

Upon the addition of traffic related to both Project 1 and Project 2 to the existing volumes, the study intersections are expected to operate acceptably except for SR 12-29/Airport Boulevard. These results are summarized in Table 13, and volumes are shown in Figure 8.

Table 13 – Existing and Existing plus Project 1 and 2 Peak Hour Intersection Levels of Service								
Study Intersection ***Approach***	**Existing Conditions**				**Existing plus Project 1 & 2**			
	AM Peak		**PM Peak**		**AM Peak**		**PM Peak**	
	Delay	**LOS**	**Delay**	**LOS**	**Delay**	**LOS**	**Delay**	**LOS**
1. Devlin Rd/Gateway Rd	1.6	A	2.5	A	2.0	A	3.2	A
EB (Gateway Rd) Approach	*16.6*	*C*	*32.1*	*D*	*13.6*	*B*	*27.2*	*D*
WB (Gateway Rd) Approach	*22.9*	*C*	*19.3*	*C*	*25.4*	*D*	*22.3*	*C*
2. Devlin Rd/Airport Blvd	18.7	B	31.3	C	18.7	B	31.5	C
3. SR 12-29/Airport Blvd	**58.7**	**E**	**111**	**F**	**59.0**	**E**	**114**	**F**

Notes: Delay is measured in average seconds per vehicle; LOS = Level of Service; Results for minor approaches to two-way stop-controlled intersections are indicated in *italics;* **Bold** text = deficient operation

Both projects analyzed together would not have an adverse effect on intersection operations since the addition of trips generated by both projects increases entering volumes at SR 12-29/Airport Boulevard by less than one percent.

Finding – Devlin Road/Gateway Road and Devlin Road/Airport Boulevard are expected to continue operating acceptably upon the addition of project-generated traffic. Although SR 12-29/Airport Boulevard is expected to continue operating unacceptably with the addition of project trips, the volume for both projects together is less than one percent of existing operation so the effect on operation is considered acceptable.

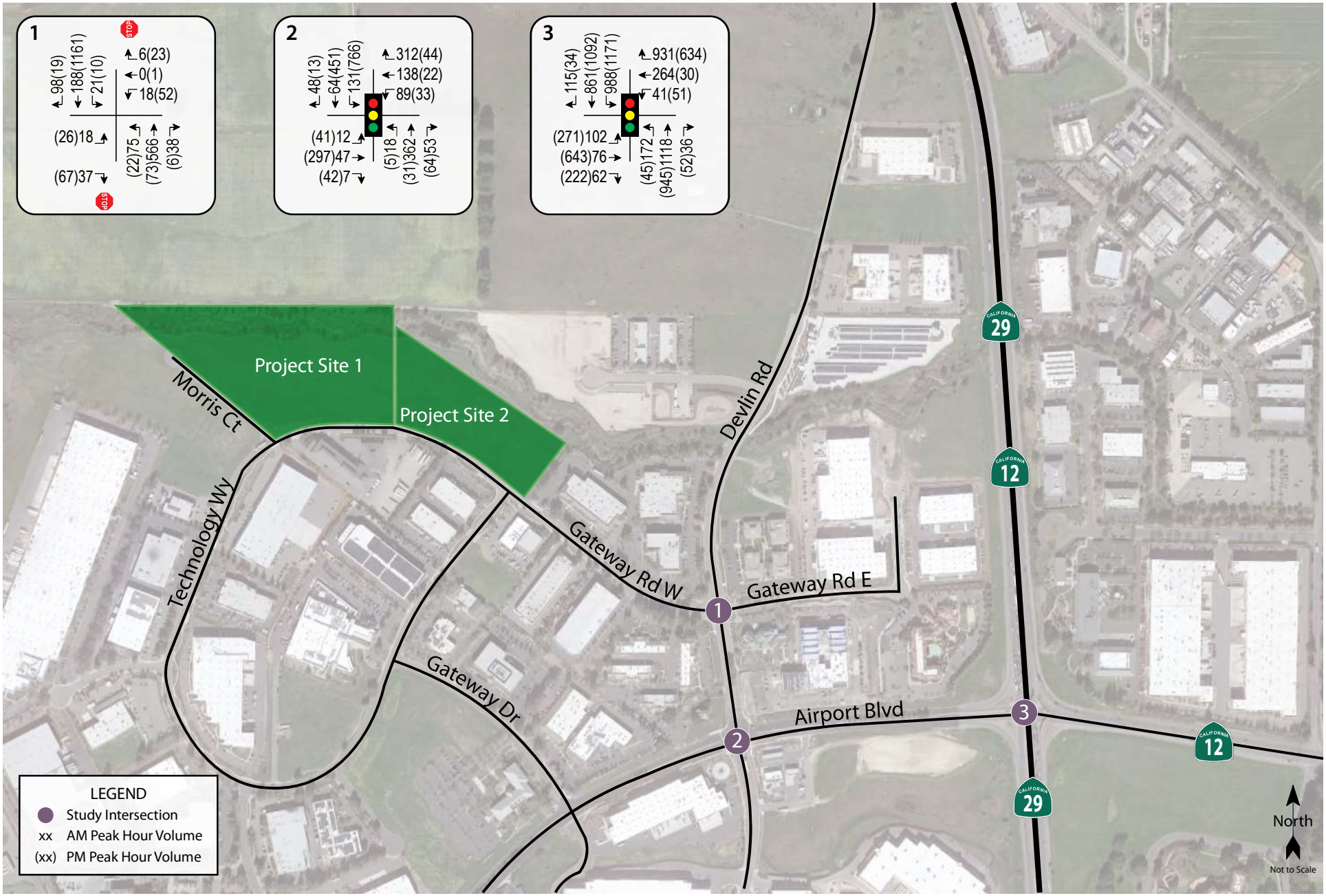

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Figure 8 – Existing plus Project 1 and 2 Traffic Volumes

Future plus Project Conditions

Future plus Project 1

Upon the addition of project-generated traffic for Project 1 to the anticipated future volumes, the eastbound approach to Devlin Road/Gateway Road would operate unacceptably during the evening peak hour and SR 12-29/Airport Boulevard would operate at LOS F during both peak hours. The Future plus Project 1 operating conditions are summarized in Table 14. Future plus Project 1 volumes are provided in Figure 9.

Table 14 – Future and Future plus Project 1 Peak Hour Intersection Levels of Service

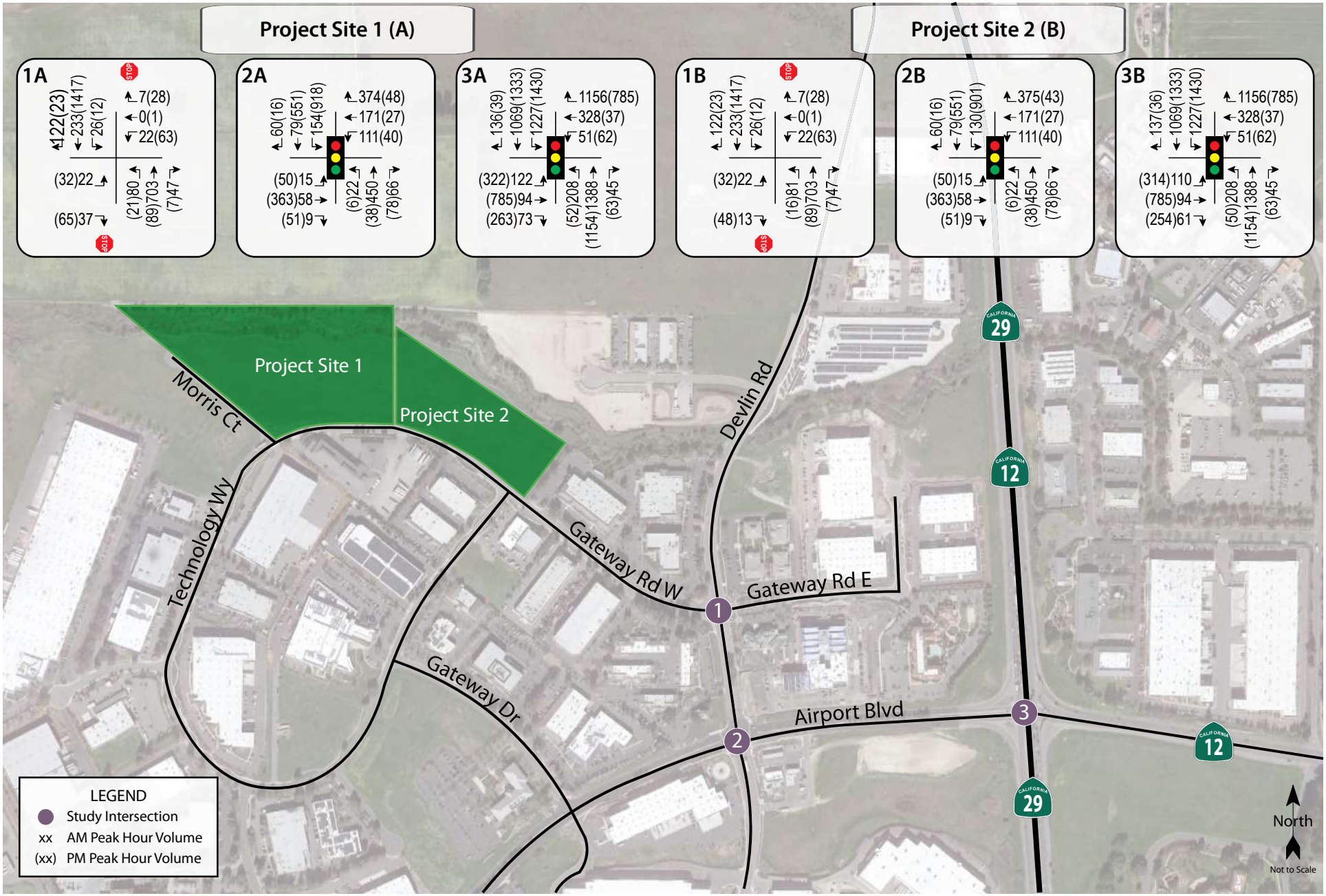
Study Intersection ***Approach***	**Future Conditions**				**Future plus Project 1**			
	AM Peak		**PM Peak**		**AM Peak**		**PM Peak**	
	Delay	**LOS**	**Delay**	**LOS**	**Delay**	**LOS**	**Delay**	**LOS**
1. Devlin Rd/Gateway Rd	1.8	A	4.2	A	2.1	A	4.8	A
EB (Gateway Rd) Approach	*19.4*	*C*	***60.9***	***F***	*15.5*	*C*	***52.0***	***F***
WB (Gateway Rd) Approach	*29.5*	*D*	*27.5*	*D*	*31.5*	*D*	*32.8*	*D*
2. Devlin Rd/Airport Blvd	20.0	B	39.2	D	20.2	C	40.2	D
3. SR 12-29/Airport Blvd	**108**	**F**	**192**	**F**	**108**	**F**	**194**	**F**

Notes: Delay is measured in average seconds per vehicle; LOS = Level of Service; Results for minor approaches to two-way stop-controlled intersections are indicated in *italics;* **Bold** text = deficient operation

Because the project would be expected to add trips predominantly to the stop-controlled eastbound right-turn movement at Devlin Road/Gateway Road, the added trips would reduce average delay on the approach, resulting in an acceptable effect on traffic operation. The project would increase entering volumes at SR 12-29/Airport Boulevard by less than one percent, so its effect on operation is acceptable at this intersection as well.

Future plus Project 2

Upon the addition of traffic associated with Project 2 to the anticipated future volumes, the study intersection of SR 12-29/Airport Boulevard would continue to operate unacceptably at LOS F and the eastbound approach to Devlin Road/Gateway Road would operate at LOS F during the p.m. peak hour. The Future plus Project 2 operating conditions are summarized in Table 15 and volumes are shown in Figure 9.



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Transportation Impact Study for a Winery and Warehouse at the Napa Airport Business Park

Figure 9 – Future plus Project Traffic Volumes

Table 15 – Future and Future plus Project 2 Peak Hour Intersection Levels of Service								
Study Intersection ***Approach***	**Future Conditions**				**Future plus Project 2**			
	AM Peak		**PM Peak**		**AM Peak**		**PM Peak**	
	Delay	**LOS**	**Delay**	**LOS**	**Delay**	**LOS**	**Delay**	**LOS**
1. Devlin Rd/Gateway Rd	1.8	A	4.2	A	2.0	A	4.4	A
EB (Gateway Rd) Approach	*19.4*	*C*	***60.9***	***F***	*19.3*	*C*	***57.4***	***F***
WB (Gateway Rd) Approach	*29.5*	*D*	*27.5*	*D*	*30.8*	*D*	*29.3*	*D*
2. Devlin Rd/Airport Blvd	20.0	B	39.2	D	20.1	C	39.5	D
3. SR 12-29/Airport Blvd	**108**	**F**	**192**	**F**	**108**	**F**	**193**	**F**

Notes: Delay is measured in average seconds per vehicle; LOS = Level of Service; Results for minor approaches to two-way stop-controlled intersections are indicated in *italics;* **Bold** text = deficient operation

The added project trips would again be expected to reduce average delay on the eastbound Gateway Road approach to Devlin Road, resulting in an acceptable effect. As the project increases entering volumes at SR 12-29/Airport Boulevard by less than one percent, its effect on operation at this location is acceptable.

Future plus Projects 1 and 2

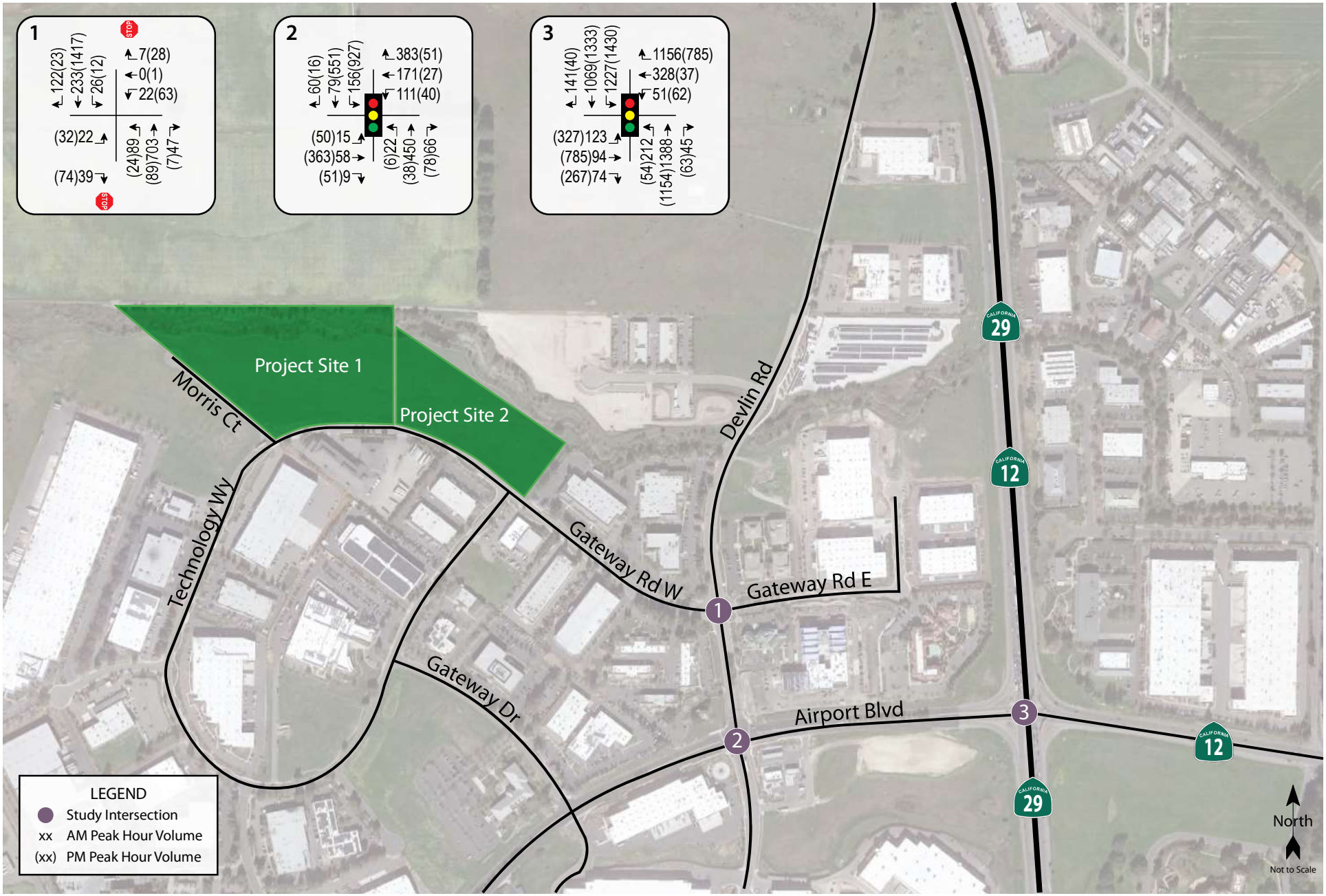
Upon the addition of traffic associated with both projects to the anticipated future volumes, SR 12-29/Airport Boulevard would continue to operate at LOS F during both peaks and the eastbound approach to Devlin Road/Gateway Road would continue to operate at LOS F during the p.m. peak hour. The Future plus Project operating conditions are summarized in Table 16, and volumes are shown in Figure 10.

Table 16 – Future and Future plus Projects 1 and 2 Peak Hour Intersection Levels of Service								
Study Intersection ***Approach***	**Future Conditions**				**Future plus Project 1 & 2**			
	AM Peak		**PM Peak**		**AM Peak**		**PM Peak**	
	Delay	**LOS**	**Delay**	**LOS**	**Delay**	**LOS**	**Delay**	**LOS**
1. Devlin Rd/Gateway Rd	1.8	A	4.2	A	2.2	A	5.1	A
EB (Gateway Rd) Approach	*19.4*	*C*	***60.9***	***F***	*15.6*	*C*	***50.4***	***F***
WB (Gateway Rd) Approach	*29.5*	*D*	*27.5*	*D*	*32.9*	*D*	*34.9*	*D*
2. Devlin Rd/Airport Blvd	20.0	B	39.2	D	20.4	C	40.6	D
3. SR 12-29/Airport Blvd	**108**	**F**	**192**	**F**	**108**	**F**	**195**	**F**

Notes: Delay is measured in average seconds per vehicle; LOS = Level of Service; Results for minor approaches to two-way stop-controlled intersections are indicated in *italics;* **Bold** text = deficient operation

The project would not increase delay on the stop-controlled eastbound approach to Devlin Road/Gateway Road, so the effect on traffic operation would be acceptable. The addition of project-generated trips from both projects increases entering volumes at SR 12-29/Airport Boulevard by less than one percent, so the projects would have an acceptable effect on operation.

Finding – Upon the addition of both project-generated traffic volumes to future volumes, the eastbound approach at Devlin Road/Gateway Road and the intersection of SR 12-29/Airport Boulevard are expected to continue operating unacceptably. However, both projects would have an acceptable effect on operation under Napa County traffic operation standards.



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Transportation Impact Study for a Winery and Warehouse at the Napa Airport Business Park

Figure 10 – Future plus Project 1 and 2 Traffic Volumes

Parking

The project was analyzed to determine whether the proposed parking supply would be sufficient to satisfy the number of parking spaces required by the County's Zoning Code for industrial uses. The winery as proposed would provide a total of 68 parking spaces for tank and barrel storage, 47 spaces for production and bottling, and 14 spaces for the office for a total of 129 parking spaces. The warehouse as proposed would provide 82 total parking spaces, 38 of which would be for the warehouse and 44 for the office.

Jurisdictional parking supply requirements are based on the Napa County Zoning Code, Section 18.44.080. The proposed parking supply is anticipated to adequately satisfy the required number of parking spaces for the winery and warehouse projects individually.

The proposed parking supply and requirements are shown in Table 17.

Table 17 – Parking Analysis Summary

Land Use	Units	Supply (spaces)	Napa County Parking Requirements	
			Rate	Spaces Required
Project 1 (Winery)				
Tank/Barrel Storage	116.112 ksf	68	1 per 1 ksf for the first 20 ksf 1 per 2 ksf above 20 ksf	68
Production/Bottling	23.7 ksf	47	1 per 500 square ft	47
Office	3.5 ksf	14	1 per 250 square ft	14
Project 1 Total		**129**		**129**
Project 2 (Warehouse)				
Warehouse	55.915 ksf	38	1 per 1 ksf for the first 20 ksf 1 per 2 ksf above 20 ksf	38
Office	11 ksf	44	1 per 250 square ft	44
Project 2 Total		**82**		**82**

Notes: ksf = 1,000 square feet.

Finding – Each of the proposed projects as planned would satisfy the County's Zoning Code off-street parking requirements.

Conclusions and Recommendations

Conclusions

- The proposed winery is expected to generate an average of 71 daily trips during non-harvest months, including 23 weekday a.m. and p.m. peak hour trips. During harvest months, the winery would be expected to generate 104 trips per day, with 34 weekday peak hour trips.
- The proposed warehouse is expected to generate 114 trips per day, including 11 morning peak hour trips and 12 evening peak hour trips.
- Pedestrian, bicycle, and transit facilities are adequate and would be improved by the sidewalk installation included as part of each project. This would be consistent with the County's policies.
- Project 1 screens out as being presumed to have a less-than-significant impact on VMT. Project 2 would need to achieve a reduction of 15 percent of daily vehicle travel, or 202 VMT per day, for the VMT impact to be considered less than significant.
- The implementation of TDM measures, which would include a commute trip reduction program, a ridesharing program, telework/compressed/flex schedules, and providing end-of-trip bicycle facilities, would be expected to reduce VMT by approximately 15 percent and result in a less-than-significant impact for the warehouse project.
- A left-turn lane would not be warranted at either project's driveways.
- The proposed projects would be designed to adequately accommodate emergency response vehicles if applicable standards are followed, resulting in a less-than-significant impact on emergency response.
- Under Existing Conditions, the study intersections are operating acceptably with the exception of SR 12-29/Airport Boulevard, which operates unacceptably. All intersections would be expected to continue operating at the same service levels with project volumes added. The projects have an acceptable effect on operation since the addition of either project individually or both projects together increase the volumes at SR 12-29/Airport Boulevard, which operates deficiently, by less than one percent.
- Under Future Conditions and Future plus Project Conditions, the eastbound Gateway Road approach to Devlin Road/Gateway Road is expected to operate unacceptably during the p.m. peak hour and SR 12-29/Airport Boulevard would continue to operate unacceptably during both peak hours. The projects have an acceptable effect on operation since delay would not increase on the eastbound approach to Devlin Road/Gateway Road and the volumes at SR 12-29/Airport Boulevard would increase by less than one percent.
- Each of the proposed projects as planned would provide a parking supply that would satisfy the County's Zoning Code off-street parking requirements.

Recommendations

- Each project should provide a minimum of ten (10) bicycle parking spaces, with at least five for each project covered.
- A Transportation Demand Management (TDM) Plan should be prepared by the future tenants of the warehouse project and include measures necessary to achieve a 15-percent reduction in project-related trips.
- Proposed landscaping within the vision triangle at the project driveways should consist of either low-lying (three feet high or less) or trees with all branches trimmed to a minimum height of seven feet above the roadway elevation.

Study Participants and References

Study Participants

Principal in Charge	Dalene J. Whitlock, PE (Civil, Traffic), PTOE
Associate Planner	Mark Brown
Assistant Engineer	Valerie Haines, EIT
Graphics	Cameron Wong, Jessica Bender
Editing/Formatting	Jessica Bender
Quality Control	Dalene J. Whitlock, PE (Civil, Traffic), PTOE

References

2019 Collision Data on California State Highways, California Department of Transportation, 2021
Highway Capacity Manual (HCM), Transportation Research Board, 2022
Highway Design Manual, 7th Edition, California Department of Transportation, 2020
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Napa County Zoning Code, County of Napa, 2023
Napa Valley Transportation Authority, https://www.nvta.ca.gov
Statewide Integrated Traffic Records System (SWITRS), California Highway Patrol, 2017-2022
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Appendix A

Intersection Turning Movement Counts

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National Data & Surveying Services Intersection Turning Movement Count

Location: Devlin Rd & Gateway Rd
City: Napa
Control: 2-Way Stop(EB/WB)

Project ID: 23-080228-001
Date: 8/24/2023

Data - Totals

NS/EW Streets:	Devlin Rd				Devlin Rd				Gateway Rd				Gateway Rd				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	13	96	4	0	3	46	23	0	7	0	2	0	3	0	9	0	206
7:15 AM	12	116	3	0	4	38	24	0	2	0	2	0	1	0	2	0	204
7:30 AM	12	162	4	0	3	34	17	0	4	0	3	0	2	0	1	0	242
7:45 AM	16	168	12	0	6	50	24	0	3	0	4	0	5	0	2	0	290
8:00 AM	15	143	6	0	6	55	33	0	5	0	1	0	4	0	0	0	268
8:15 AM	15	93	16	0	5	49	24	1	6	0	1	0	7	0	3	0	220
8:30 AM	21	98	14	0	9	46	26	0	2	0	3	0	11	0	1	0	231
8:45 AM	11	61	15	0	6	57	19	0	12	0	3	0	0	0	3	0	187
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	115	937	74	0	42	375	190	1	41	0	19	0	33	0	21	0	1848
APPROACH %'s :	10.21%	83.21%	6.57%	0.00%	6.91%	61.68%	31.25%	0.16%	68.33%	0.00%	31.67%	0.00%	61.11%	0.00%	38.89%	0.00%	
PEAK HR :	07:30 AM - 08:30 AM																TOTAL
PEAK HR VOL :	58	566	38	0	20	188	98	1	18	0	9	0	18	0	6	0	1020
PEAK HR FACTOR :	0.906	0.842	0.594	0.000	0.833	0.855	0.742	0.250	0.750	0.000	0.563	0.000	0.643	0.000	0.500	0.000	0.879
	0.844				0.816				0.964				0.600				

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	5	35	0	2	0	177	4	0	10	0	11	0	2	2	8	0	256
4:15 PM	2	33	1	1	3	275	4	0	7	0	10	0	5	0	3	0	344
4:30 PM	1	38	6	0	1	226	5	0	20	0	15	0	6	0	3	0	321
4:45 PM	2	14	2	0	1	300	5	0	5	0	5	0	6	1	3	0	344
5:00 PM	1	24	2	0	3	242	7	0	10	0	13	0	23	0	2	0	327
5:15 PM	4	15	2	1	4	312	5	0	9	0	7	0	11	0	11	0	381
5:30 PM	3	20	0	0	2	307	2	0	2	0	7	0	12	0	7	0	362
5:45 PM	1	17	1	2	3	295	0	0	3	0	5	0	4	0	2	0	333
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	19	196	14	6	17	2134	32	0	66	0	73	0	69	3	39	0	2668
APPROACH %'s :	8.09%	83.40%	5.96%	2.55%	0.78%	97.76%	1.47%	0.00%	47.48%	0.00%	52.52%	0.00%	62.16%	2.70%	35.14%	0.00%	
PEAK HR :	04:45 PM - 05:45 PM																TOTAL
PEAK HR VOL :	10	73	6	1	10	1161	19	0	26	0	32	0	52	1	23	0	1414
PEAK HR FACTOR :	0.625	0.760	0.750	0.250	0.625	0.930	0.679	0.000	0.650	0.000	0.615	0.000	0.565	0.250	0.523	0.000	0.928
	0.833				0.927				0.630				0.760				

National Data & Surveying Services Intersection Turning Movement Count

Location: Devlin Rd & Airport Blvd
City: Napa
Control: Signalized

Project ID: 23-080228-002
Date: 8/24/2023

Data - Totals

NS/EW Streets:	Devlin Rd				Devlin Rd				Airport Blvd				Airport Blvd				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	3	49	10	0	24	14	8	0	2	12	2	0	30	27	70	0	251
7:15 AM	3	58	18	0	19	17	4	0	2	5	0	0	17	33	77	1	254
7:30 AM	5	97	15	0	16	15	7	0	3	9	0	0	21	25	89	2	304
7:45 AM	3	106	16	0	22	22	13	0	4	14	2	0	24	41	75	1	343
8:00 AM	5	92	12	0	31	14	15	0	2	11	3	0	21	36	69	0	311
8:15 AM	5	67	10	0	34	13	13	0	3	13	2	0	20	36	62	0	278
8:30 AM	6	61	19	0	38	15	9	0	5	7	2	0	20	47	68	0	297
8:45 AM	2	34	11	0	21	27	10	0	1	12	1	0	18	26	52	0	215
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	32	564	111	0	205	137	79	0	22	83	12	0	171	271	562	4	2253
APPROACH %'s :	4.53%	79.77%	15.70%	0.00%	48.69%	32.54%	18.76%	0.00%	18.80%	70.94%	10.26%	0.00%	16.96%	26.88%	55.75%	0.40%	
PEAK HR :	07:30 AM - 08:30 AM																TOTAL
PEAK HR VOL :	18	362	53	0	103	64	48	0	12	47	7	0	86	138	295	3	1236
PEAK HR FACTOR :	0.900	0.854	0.828	0.000	0.757	0.727	0.800	0.000	0.750	0.839	0.583	0.000	0.896	0.841	0.829	0.375	0.901
	0.866				0.896				0.825				0.926				

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	1	17	19	0	142	76	1	0	13	55	25	0	5	6	10	1	371
4:15 PM	1	8	12	0	174	116	1	0	14	53	14	0	8	5	14	0	420
4:30 PM	0	14	20	0	162	100	4	0	17	108	11	0	8	6	11	0	461
4:45 PM	0	2	10	0	166	139	5	0	8	63	11	0	8	9	7	0	428
5:00 PM	4	8	23	0	168	105	2	0	12	84	12	0	11	2	9	0	440
5:15 PM	1	7	11	0	235	107	2	0	4	42	8	0	6	5	6	0	434
5:30 PM	0	5	5	0	217	107	5	0	6	22	1	0	6	2	12	0	388
5:45 PM	0	5	5	0	207	89	2	0	4	32	1	0	11	3	12	2	373
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	7	66	105	0	1471	839	22	0	78	459	83	0	63	38	81	3	3315
APPROACH %'s :	3.93%	37.08%	58.99%	0.00%	63.08%	35.98%	0.94%	0.00%	12.58%	74.03%	13.39%	0.00%	34.05%	20.54%	43.78%	1.62%	
PEAK HR :	04:30 PM - 05:30 PM																TOTAL
PEAK HR VOL :	5	31	64	0	731	451	13	0	41	297	42	0	33	22	33	0	1763
PEAK HR FACTOR :	0.313	0.554	0.696	0.000	0.778	0.811	0.650	0.000	0.603	0.688	0.875	0.000	0.750	0.611	0.750	0.000	0.956
	0.714				0.868				0.699				0.880				

National Data & Surveying Services Intersection Turning Movement Count

Location: SR 29 & SR 12/Airport Blvd
City: Napa
Control: Signalized

Project ID: 23-080228-003
Date: 8/24/2023

Data - Totals

NS/EW Streets:	SR 29				SR 29				SR 12/Airport Blvd				SR 12/Airport Blvd				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	48	345	5	0	229	226	23	2	25	12	12	0	10	55	227	0	1219
7:15 AM	44	260	7	0	259	194	23	4	23	21	12	0	12	75	242	0	1176
7:30 AM	44	307	15	0	220	221	21	2	16	21	10	0	4	58	235	0	1174
7:45 AM	28	206	9	0	267	220	39	5	24	22	14	0	15	76	227	0	1152
8:00 AM	40	252	11	0	223	187	26	2	35	29	15	0	25	58	187	0	1090
8:15 AM	38	335	10	2	215	213	33	1	22	24	15	0	12	53	185	0	1158
8:30 AM	47	258	7	0	274	218	29	1	16	35	16	0	11	53	180	0	1145
8:45 AM	31	261	8	0	215	188	19	1	18	25	11	0	22	51	183	0	1033
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	320	2224	72	2	1902	1667	213	18	179	189	105	0	111	479	1666	0	9147
APPROACH %'s :	12.22%	84.95%	2.75%	0.08%	50.05%	43.87%	5.61%	0.47%	37.84%	39.96%	22.20%	0.00%	4.92%	21.23%	73.85%	0.00%	
PEAK HR :	07:00 AM - 08:00 AM																TOTAL
PEAK HR VOL :	164	1118	36	0	975	861	106	13	88	76	48	0	41	264	931	0	4721
PEAK HR FACTOR :	0.854	0.810	0.600	0.000	0.913	0.952	0.679	0.650	0.880	0.864	0.857	0.000	0.683	0.868	0.962	0.000	0.968
	0.828				0.920				0.883				0.939				

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				hah				
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	5	268	13	0	270	242	10	0	39	153	33	0	11	10	121	0	1175
4:15 PM	12	248	7	0	330	272	8	3	47	148	43	0	9	4	193	0	1324
4:30 PM	6	237	19	0	277	271	8	0	81	156	61	0	21	12	157	0	1306
4:45 PM	11	188	14	1	278	277	4	2	53	190	49	0	11	8	143	0	1229
5:00 PM	8	272	12	1	281	272	9	0	72	149	52	0	10	6	150	0	1294
5:15 PM	6	218	10	1	337	277	6	0	46	146	60	0	10	4	167	0	1288
5:30 PM	8	179	13	1	281	234	4	1	39	184	60	0	13	8	163	0	1188
5:45 PM	5	252	7	0	273	314	17	0	37	169	79	0	11	6	150	0	1320
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	61	1862	95	4	2327	2159	66	6	414	1295	437	0	96	58	1244	0	10124
APPROACH %'s :	3.02%	92.09%	4.70%	0.20%	51.05%	47.37%	1.45%	0.13%	19.29%	60.34%	20.36%	0.00%	6.87%	4.15%	88.98%	0.00%	
PEAK HR :	04:15 PM - 05:15 PM																TOTAL
PEAK HR VOL :	37	945	52	2	1166	1092	29	5	253	643	205	0	51	30	643	0	5153
PEAK HR FACTOR :	0.771	0.869	0.684	0.500	0.883	0.986	0.806	0.417	0.781	0.846	0.840	0.000	0.607	0.625	0.833	0.000	0.973
	0.884				0.935				0.924				0.879				

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Appendix B

Collision Rate Calculations

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Intersection Collision Rate Worksheet

TIS for a Winery and Warehouse at the Napa Airport Business Park

Intersection # 1: Devlin Road & Gateway Road

Date of Count: Thursday, August 24, 2023

Number of Collisions: 7
Number of Injuries: 4
Number of Fatalities: 0
Average Daily Traffic (ADT): 12800
Start Date: January 1, 2018
End Date: December 31, 2022
Number of Years: 5

Intersection Type: Four-Legged
Control Type: Stop & Yield Controls
Area: Rural

$$\text{Collision Rate} = \frac{\text{Number of Collisions x 1 Million}}{\text{ADT x Days per Year x Number of Years}}$$

$$\text{Collision Rate} = \frac{7 \times 1{,}000{,}000}{12{,}800 \times 365 \times 5}$$

	Collision Rate	Fatality Rate	Injury Rate
Study Intersection	**0.30 c/mve**	**0.0%**	**57.1%**
Statewide Average*	**0.36 c/mve**	**2.4%**	**43.4%**

Notes
ADT = average daily total vehicles entering intersection
c/mve = collisions per million vehicles entering intersection
* 2019 Collision Data on California State Highways, Caltrans

Intersection # 2: Devlin Road & Airport Boulevard

Date of Count: Thursday, August 24, 2023

Number of Collisions: 14
Number of Injuries: 2
Number of Fatalities: 0
Average Daily Traffic (ADT): 15500
Start Date: January 1, 2018
End Date: December 31, 2022
Number of Years: 5

Intersection Type: Four-Legged
Control Type: Signals
Area: Rural

$$\text{Collision Rate} = \frac{\text{Number of Collisions x 1 Million}}{\text{ADT x Days per Year x Number of Years}}$$

$$\text{Collision Rate} = \frac{14 \times 1{,}000{,}000}{15{,}500 \times 365 \times 5}$$

	Collision Rate	Fatality Rate	Injury Rate
Study Intersection	**0.49 c/mve**	**0.0%**	**14.3%**
Statewide Average*	**0.74 c/mve**	**0.6%**	**34.2%**

Notes
ADT = average daily total vehicles entering intersection
c/mve = collisions per million vehicles entering intersection
* 2019 Collision Data on California State Highways, Caltrans

Intersection Collision Rate Worksheet

TIS for a Winery and Warehouse at the Napa Airport Business Park

Intersection # 3: SR 12-29 & Airport Boulevard
Date of Count: Thursday, August 24, 2023

Number of Collisions: 19
Number of Injuries: 3
Number of Fatalities: 0
Average Daily Traffic (ADT): 47200
Start Date: January 1, 2018
End Date: December 31, 2022
Number of Years: 5

Intersection Type: Four-Legged
Control Type: Signals
Area: Rural

$$\text{Collision Rate} = \frac{\text{Number of Collisions x 1 Million}}{\text{ADT x Days per Year x Number of Years}}$$

$$\text{Collision Rate} = \frac{19 \times 1{,}000{,}000}{47{,}200 \times 365 \times 5}$$

	Collision Rate	Fatality Rate	Injury Rate
Study Intersection	**0.22 c/mve**	**0.0%**	**15.8%**
Statewide Average*	**0.74 c/mve**	**0.6%**	**34.2%**

Notes
ADT = average daily total vehicles entering intersection
c/mve = collisions per million vehicles entering intersection
* 2019 Collision Data on California State Highways, Caltrans

Appendix C

Napa County Winery Trip Generation Worksheet

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WINERY TRIP GENERATION WORKSHEET

Planning, Building & Environmental Services
1195 Third Street, Suite 210
Napa, CA 94559-3082
(707) 253-4417

A Tradition of Stewardship
A Commitment to Service

Clear Form

PROJECT DESCRIPTION

Winery Name: Napa Airport Business Park Wine Production Facility **Date Prepared:** 7/13/23

Existing Winery	Harvest	Non-Harvest
Number of Full Time Employees*		
Number of Part Time Employees*		
Maximum Daily Visitation		
Annual Gallons of Production		
Annual Tons of Grape Haul		N/A
Square Footage of the Building(s) that Houses the Tasting Room		N/A
Number of Visitors at the Largest Event that occurs two or more times per month, on average		

Proposed Winery	Harvest	Non-Harvest
Number of Full Time Employees*	25	16
Number of Part Time Employees*	10	7
Maximum Daily Visitation	0	0
Annual Gallons of Production	450,000	450,000
Annual Tons of Grape Haul		N/A
Square Footage of the Building(s) that Houses the Tasting Room	0	N/A
Number of Visitors at the Largest Event that occurs two or more times per month, on average	0	0

*Number of full time and part time employees should represent the max number of employees that will be working on any given day (including the largest event that occurs two or more times per month on average).

Napa Airport Business Park Wine Production Facility

TRIP GENERATION

Existing Winery					Harvest	Non-Harvest
Maximum Daily Weekday Traffic (Friday)						
	Harvest	*Non-Harvest*				
FT Employees			3.05 one way trips/employee	FT Employee Daily Trips	0.0	0.0
PT Employees			1.9 one way trips/employee	PT Employee Daily Trips	0.0	0.0
Max Visitors	0	0	2.6 visitors/vehicle for 2 one way trips	Max Visitor Daily Trips	0.0	0.0
Gallons of Production			0.000018 truck trips	Production Daily Trips	0.0	0.0
Tons of Grape Haul#			0.013889 truck trips	Grape Haul Daily Trips	0.0	0
				Total Weekday Daily Trips	**0**	**0**
				Total Weekday Peak Hour Trips*	**0**	**0**
Maximum Daily Weekend Traffic (Saturday)						
	Harvest	*Non-Harvest*				
FT Employees			3.05 one way trips/employee	FT Employee Daily Trips	0.0	0.0
PT Employees			1.9 one way trips/employee	PT Employee Daily Trips	0.0	0.0
Max Visitors	0	0	2.8 visitors/vehicle for 2 one way trips	Max Visitor Daily Trips	0.0	0.0
Gallons of Production			0.000018 truck trips	Production Daily Trips	0.0	0.0
Tons of Grape Haul#			0.013889 truck trips	Grape Haul Daily Trips	0.0	0
				Total Weekend Daily Trips	**0**	**0**
				Total Weekend Peak Hour Trips*	**0**	**0**
Maximum Annual Traffic						
				Total Annual Trips**	**0**	

Proposed Winery					Harvest	Non-Harvest
Maximum Daily Weekday Traffic (Friday)						
	Harvest	*Non-Harvest*				
FT Employees	25	16	3.05 one way trips/employee	FT Employee Daily Trips	76.3	48.8
PT Employees	10	7	1.9 one way trips/employee	PT Employee Daily Trips	19.0	13.3
Max Visitors	0	0	2.6 visitors/vehicle for 2 one way trips	Max Visitor Daily Trips	0.0	0.0
Gallons of Production	450,000		0.000018 truck trips	Production Daily Trips	8.1	8.1
Tons of Grape Haul#			0.013889 truck trips	Grape Haul Daily Trips	0.0	0.0
				Total Weekday Daily Trips	**104**	**71**
				Total Weekday Peak Hour Trips*	**34**	**23**
Maximum Daily Weekend Traffic (Saturday)						
	Harvest	*Non-Harvest*				
FT Employees	25	16	3.05 one way trips/employee	FT Employee Daily Trips	76.3	48.8
PT Employees	10	7	1.9 one way trips/employee	PT Employee Daily Trips	19.0	13.3
Max Visitors	0	0	2.8 visitors/vehicle for 2 one way trips	Max Visitor Daily Trips	0.0	0.0
Gallons of Production	450,000		0.000018 truck trips	Production Daily Trips	8.1	8.1
Tons of Grape Haul#			0.013889 truck trips	Grape Haul Daily Trips	0.0	0.0
				Total Weekend Daily Trips	**104**	**71**
				Total Weekend Peak Hour Trips*	**35**	**25**
Maximum Annual Traffic						
				Total Annual Trips**	**28,456**	

Net New Trips		Harvest	Non-Harvest
Maximum Weekday Traffic (Friday)			
If total net new daily trips is greater than 40, a TIS is required	**Net New Weekday Daily Trips**	**104**	**71**
	Net New Weekday Peak Hour Trips*	**34**	**23**
Maximum Weekend Traffic (Saturday)			
If total net new daily trips is greater than 40, a TIS is required	**Net New Weekend Daily Trips**	**104**	**71**
	Net New Weekend Peak Hour Trips*	**35**	**25**
Maximum Annual Traffic			
Please Prepare a Traffic Impact Study	**Net New Annual Trips****	**28,456**	

#Trips associated with Grape Haul represent harvest season only.

*Weekday peak hour trips are calculated as 38% of daily trips associated with visitors and production plus one trip per employee. Weekend peak hour trips are calculated as 57% of daily trips associated with visitors and production plus one trip per employee.

**Annual trips represent a conservative calculation that assumes 11 weeks of harvest, all weekdays are Fridays, all weekends are Saturdays, and assumes that the largest event that occurs two or more times per month on average occurs every day.

Appendix D

Turn Lane Warrant Graph

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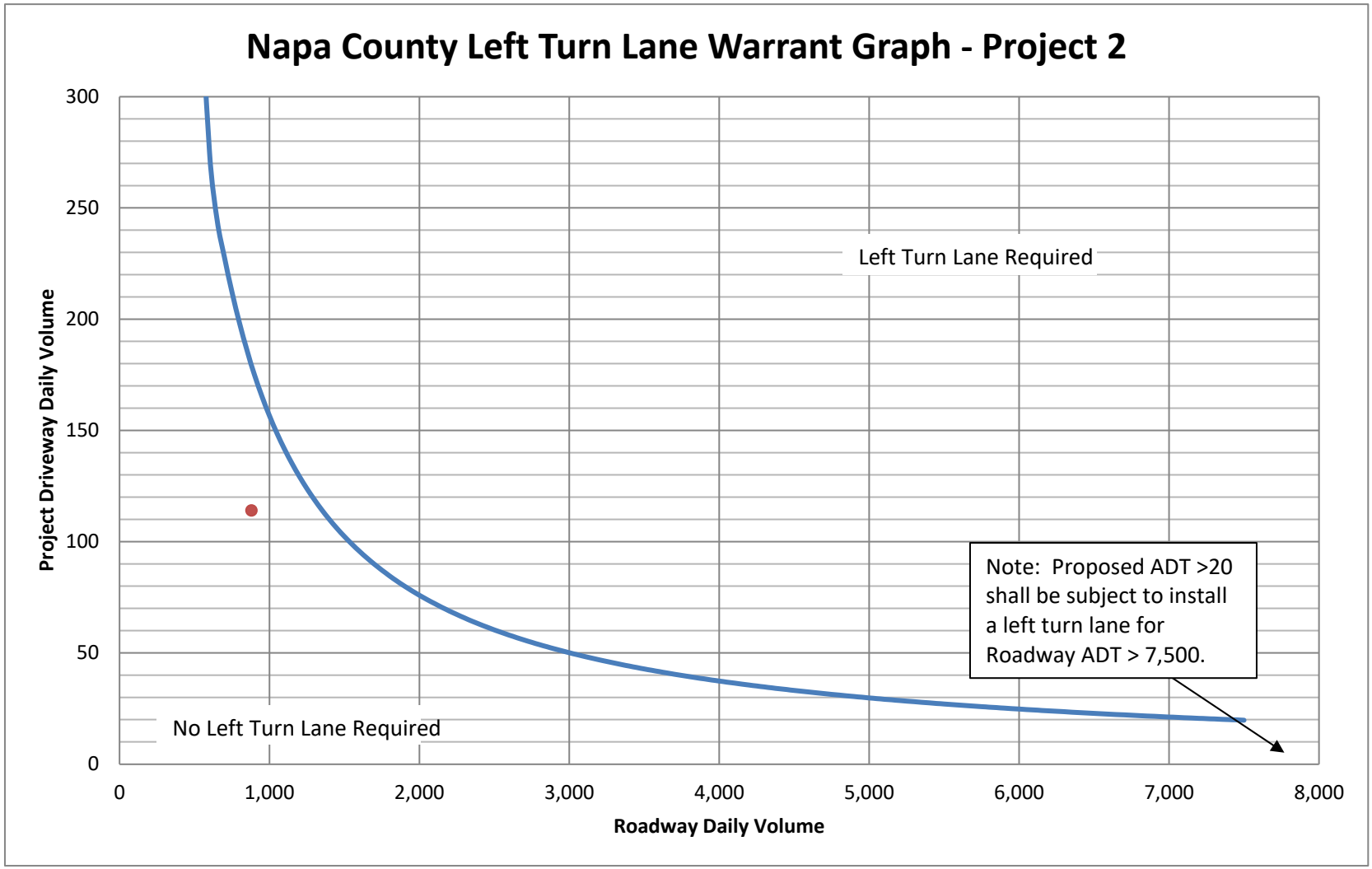
Napa County Left Turn Lane Warrant Graph - Project 2
Project Driveway Daily Volume
300
250
200
150
100
50
0
0
1,000
2,000
3,000
4,000
5,000
6,000
7,000
8,000
Roadway Daily Volume
Left Turn Lane Required
No Left Turn Lane Required
Note: Proposed ADT >20 shall be subject to install a left turn lane for Roadway ADT > 7,500.

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Appendix E

Intersection Level of Service Calculations

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HCM 6th TWSC
1: Devlin Rd & Gateway Rd W/Gateway Rd E

11/14/2023

Intersection	
Int Delay, s/veh	1.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	18	0	9	18	0	6	58	566	38	21	188	98
Future Vol, veh/h	18	0	9	18	0	6	58	566	38	21	188	98
Conflicting Peds, #/hr	1	0	7	6	0	0	7	0	6	0	0	1
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	160	-	370	-	-	-	175	-	-	0	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	5	5	5	5	5	5	5	5	5	5	5	5
Mvmt Flow	20	0	10	20	0	7	66	643	43	24	214	111

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	780	1149	177	965	1183	350	332	0	0	692	0	0
Stage 1	325	325	-	803	803	-	-	-	-	-	-	-
Stage 2	455	824	-	162	380	-	-	-	-	-	-	-
Critical Hdwy	7.6	6.6	7	7.6	6.6	7	4.2	-	-	4.2	-	-
Critical Hdwy Stg 1	6.6	5.6	-	6.6	5.6	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.6	5.6	-	6.6	5.6	-	-	-	-	-	-	-
Follow-up Hdwy	3.55	4.05	3.35	3.55	4.05	3.35	2.25	-	-	2.25	-	-
Pot Cap-1 Maneuver	280	193	826	205	184	638	1203	-	-	879	-	-
Stage 1	653	640	-	337	387	-	-	-	-	-	-	-
Stage 2	547	378	-	815	605	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	258	175	815	188	167	634	1195	-	-	874	-	-
Mov Cap-2 Maneuver	258	175	-	188	167	-	-	-	-	-	-	-
Stage 1	613	618	-	316	363	-	-	-	-	-	-	-
Stage 2	511	355	-	777	584	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	16.6	22.9	0.7	0.6
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	EBLn3	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1195	-	-	258	-	815	228	874	-	-
HCM Lane V/C Ratio	0.055	-	-	0.079	-	0.013	0.12	0.027	-	-
HCM Control Delay (s)	8.2	-	-	20.2	0	9.5	22.9	9.2	-	-
HCM Lane LOS	A	-	-	C	A	A	C	A	-	-
HCM 95th %tile Q(veh)	0.2	-	-	0.3	-	0	0.4	0.1	-	-

HCM 6th Signalized Intersection Summary
2: Devlin Rd & Airport Blvd

11/14/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	12	47	7	89	138	295	18	362	53	103	64	48
Future Volume (veh/h)	12	47	7	89	138	295	18	362	53	103	64	48
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826
Adj Flow Rate, veh/h	13	52	5	99	153	186	20	402	36	75	126	40
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	5	5	5	5	5	5	5	5	5	5	5	5
Cap, veh/h	40	456	43	183	390	347	338	626	56	245	377	115
Arrive On Green	0.02	0.14	0.14	0.11	0.22	0.22	0.19	0.19	0.19	0.14	0.14	0.14
Sat Flow, veh/h	1739	3202	303	1739	1735	1543	1739	3221	287	1739	2676	814
Grp Volume(v), veh/h	13	28	29	99	153	186	20	216	222	75	84	82
Grp Sat Flow(s),veh/h/ln	1739	1735	1771	1739	1735	1543	1739	1735	1773	1739	1826	1664
Q Serve(g_s), s	0.4	0.7	0.7	2.7	3.7	5.2	0.5	5.6	5.7	1.9	2.0	2.2
Cycle Q Clear(g_c), s	0.4	0.7	0.7	2.7	3.7	5.2	0.5	5.6	5.7	1.9	2.0	2.2
Prop In Lane	1.00		0.17	1.00		1.00	1.00		0.16	1.00		0.49
Lane Grp Cap(c), veh/h	40	247	252	183	390	347	338	337	345	245	257	234
V/C Ratio(X)	0.32	0.11	0.12	0.54	0.39	0.54	0.06	0.64	0.64	0.31	0.33	0.35
Avail Cap(c_a), veh/h	707	1058	1080	707	1270	1129	1273	1270	1298	1237	1299	1184
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	23.6	18.4	18.4	20.9	16.2	16.8	16.1	18.2	18.2	19.0	19.0	19.1
Incr Delay (d2), s/veh	1.7	0.1	0.1	0.9	0.2	0.5	0.0	0.8	0.8	0.3	0.3	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.2	0.2	1.0	1.2	1.5	0.2	2.0	2.0	0.7	0.8	0.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	25.3	18.5	18.5	21.8	16.5	17.3	16.2	19.0	19.0	19.2	19.3	19.4
LnGrp LOS	C	B	B	C	B	B	B	B	B	B	B	B
Approach Vol, veh/h		70			438			458			241	
Approach Delay, s/veh		19.7			18.0			18.9			19.3	
Approach LOS		B			B			B			B	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	5.3	16.9		12.3	9.4	12.8		14.7
Change Period (Y+Rc), s	* 4.2	5.8		5.4	* 4.2	5.8		5.1
Max Green Setting (Gmax), s	* 20	36.0		35.0	* 20	30.0		36.0
Max Q Clear Time (g_c+I1), s	2.4	7.2		4.2	4.7	2.7		7.7
Green Ext Time (p_c), s	0.0	1.2		0.6	0.1	0.1		1.5

Intersection Summary	
HCM 6th Ctrl Delay	18.7
HCM 6th LOS	B

Notes

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary
3: SR-29/SR-12/29 & Airport Blvd/SR-12

11/14/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	88	76	48	41	264	931	164	1118	36	988	861	106
Future Volume (veh/h)	88	76	48	41	264	931	164	1118	36	988	861	106
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826
Adj Flow Rate, veh/h	94	74	0	42	272	0	169	1153	14	1019	888	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	5	5	5	5	5	5	5	5	5	5	5	5
Cap, veh/h	305	160		282	296		191	1371	426	1025	1669	
Arrive On Green	0.09	0.09	0.00	0.16	0.16	0.00	0.11	0.28	0.28	0.30	0.48	0.00
Sat Flow, veh/h	3478	1826	1547	1739	1826	1547	1739	4985	1547	3374	3469	1547
Grp Volume(v), veh/h	94	74	0	42	272	0	169	1153	14	1019	888	0
Grp Sat Flow(s),veh/h/ln	1739	1826	1547	1739	1826	1547	1739	1662	1547	1687	1735	1547
Q Serve(g_s), s	3.8	5.7	0.0	3.1	21.7	0.0	14.2	32.3	1.0	44.6	26.4	0.0
Cycle Q Clear(g_c), s	3.8	5.7	0.0	3.1	21.7	0.0	14.2	32.3	1.0	44.6	26.4	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	305	160		282	296		191	1371	426	1025	1669	
V/C Ratio(X)	0.31	0.46		0.15	0.92		0.88	0.84	0.03	0.99	0.53	
Avail Cap(c_a), veh/h	376	197		305	321		282	1515	470	1025	1669	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	63.3	64.2	0.0	53.2	61.0	0.0	64.9	50.6	39.3	51.4	26.8	0.0
Incr Delay (d2), s/veh	0.6	2.1	0.0	0.2	29.0	0.0	14.7	4.4	0.0	26.5	0.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.7	2.7	0.0	1.3	12.1	0.0	6.9	13.5	0.4	21.7	10.4	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	63.9	66.3	0.0	53.5	90.0	0.0	79.6	55.0	39.3	77.9	27.2	0.0
LnGrp LOS	E	E		D	F		E	D	D	E	C	
Approach Vol, veh/h		168			314			1336			1907	
Approach Delay, s/veh		64.9			85.1			57.9			54.3	
Approach LOS		E			F			E			D	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	21.0	77.7		30.5	51.5	47.2		18.8
Change Period (Y+Rc), s	4.7	6.5		6.5	6.5	* 6.5		5.8
Max Green Setting (Gmax), s	24.4	45.0		26.0	45.0	* 45		16.0
Max Q Clear Time (g_c+I1), s	16.2	28.4		23.7	46.6	34.3		7.7
Green Ext Time (p_c), s	0.1	6.7		0.3	0.0	6.4		0.4

Intersection Summary		
HCM 6th Ctrl Delay		58.7
HCM 6th LOS		E

Notes

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th TWSC
1: Devlin Rd & Gateway Rd W/Gateway Rd E

11/14/2023

Intersection	
Int Delay, s/veh	2.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	26	0	32	52	1	23	11	73	6	10	1161	19
Future Vol, veh/h	26	0	32	52	1	23	11	73	6	10	1161	19
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	160	-	370	-	-	-	175	-	-	0	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	5	5	5	5	5	5	5	5	5	5	5	5
Mvmt Flow	28	0	34	56	1	25	12	78	6	11	1248	20

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1344	1388	634	751	1395	42	1268	0	0	84	0	0
Stage 1	1280	1280	-	105	105	-	-	-	-	-	-	-
Stage 2	64	108	-	646	1290	-	-	-	-	-	-	-
Critical Hdwy	7.6	6.6	7	7.6	6.6	7	4.2	-	-	4.2	-	-
Critical Hdwy Stg 1	6.6	5.6	-	6.6	5.6	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.6	5.6	-	6.6	5.6	-	-	-	-	-	-	-
Follow-up Hdwy	3.55	4.05	3.35	3.55	4.05	3.35	2.25	-	-	2.25	-	-
Pot Cap-1 Maneuver	107	138	415	294	137	1010	528	-	-	1489	-	-
Stage 1	171	229	-	881	800	-	-	-	-	-	-	-
Stage 2	931	798	-	420	226	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	101	134	415	263	133	1010	528	-	-	1489	-	-
Mov Cap-2 Maneuver	101	134	-	263	133	-	-	-	-	-	-	-
Stage 1	167	227	-	861	782	-	-	-	-	-	-	-
Stage 2	886	780	-	382	224	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	32.1	19.3	1.5	0.1
HCM LOS	D	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	EBLn3	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	528	-	-	101	-	415	333	1489	-	-
HCM Lane V/C Ratio	0.022	-	-	0.277	-	0.083	0.245	0.007	-	-
HCM Control Delay (s)	12	-	-	53.8	0	14.5	19.3	7.4	-	-
HCM Lane LOS	B	-	-	F	A	B	C	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	1	-	0.3	0.9	0	-	-

HCM 6th Signalized Intersection Summary
2: Devlin Rd & Airport Blvd

11/14/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	41	297	42	33	22	33	5	31	64	731	451	13
Future Volume (veh/h)	41	297	42	33	22	33	5	31	64	731	451	13
Initial Q (Qb), veh	5	6	0	0	0	0	0	0	0	30	9	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826
Adj Flow Rate, veh/h	43	309	24	34	23	17	5	32	35	854	340	13
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	5	5	5	5	5	5	5	5	5	5	5	5
Cap, veh/h	124	502	36	89	277	184	147	146	128	1159	570	19
Arrive On Green	0.06	0.15	0.15	0.05	0.14	0.14	0.09	0.09	0.09	0.32	0.32	0.32
Sat Flow, veh/h	1739	3263	252	1739	1999	1324	1739	1735	1521	3478	1747	67
Grp Volume(v), veh/h	43	163	170	34	20	20	5	32	35	854	0	353
Grp Sat Flow(s),veh/h/ln	1739	1735	1781	1739	1735	1588	1739	1735	1521	1739	0	1814
Q Serve(g_s), s	1.2	4.6	4.7	1.0	0.5	0.6	0.1	0.9	1.1	11.5	0.0	8.6
Cycle Q Clear(g_c), s	1.2	4.6	4.7	1.0	0.5	0.6	0.1	0.9	1.1	11.5	0.0	8.6
Prop In Lane	1.00		0.14	1.00		0.83	1.00		1.00	1.00		0.04
Lane Grp Cap(c), veh/h	124	265	272	89	241	220	147	146	128	1159	0	590
V/C Ratio(X)	0.35	0.62	0.62	0.38	0.08	0.09	0.03	0.22	0.27	0.74	0.00	0.60
Avail Cap(c_a), veh/h	667	998	1025	667	1198	1096	1201	1198	1050	2335	0	1218
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	24.4	21.3	21.3	26.1	21.2	21.3	23.9	24.3	24.4	20.1	0.0	16.7
Incr Delay (d2), s/veh	0.6	0.9	0.9	1.0	0.1	0.1	0.0	0.3	0.4	0.3	0.0	0.4
Initial Q Delay(d3),s/veh	17.9	2.4	2.3	0.0	0.0	0.0	0.0	0.0	0.0	18.4	0.0	4.2
%ile BackOfQ(50%),veh/ln	1.6	2.1	2.2	0.4	0.2	0.2	0.1	0.4	0.4	9.5	0.0	4.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	42.9	24.6	24.5	27.1	21.3	21.3	24.0	24.6	24.8	38.8	0.0	21.3
LnGrp LOS	D	C	C	C	C	C	C	C	C	D	A	C
Approach Vol, veh/h		376			74			72			1207	
Approach Delay, s/veh		26.6			23.9			24.7			33.7	
Approach LOS		C			C			C			C	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	7.4	13.0		22.1	6.9	13.5		9.6
Change Period (Y+Rc), s	* 4.2	5.8		5.4	* 4.2	5.8		5.1
Max Green Setting (Gmax), s	* 20	36.0		35.0	* 20	30.0		36.0
Max Q Clear Time (g_c+I1), s	3.2	2.6		13.5	3.0	6.7		3.1
Green Ext Time (p_c), s	0.0	0.1		3.0	0.0	1.0		0.2

Intersection Summary	
HCM 6th Ctrl Delay	31.3
HCM 6th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary
3: SR-29/SR-12/29 & Airport Blvd/SR-12

11/14/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	253	643	205	51	30	643	39	945	52	1171	1092	29
Future Volume (veh/h)	253	643	205	51	30	643	39	945	52	1171	1092	29
Initial Q (Qb), veh	28	25	0	4	0	0	0	0	0	6	8	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826
Adj Flow Rate, veh/h	261	663	0	53	31	0	40	974	24	1207	1126	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	5	5	5	5	5	5	5	5	5	5	5	5
Cap, veh/h	353	741		123	212		96	1019	316	1047	1797	
Arrive On Green	0.21	0.21	0.00	0.06	0.06	0.00	0.06	0.22	0.22	0.35	0.52	0.00
Sat Flow, veh/h	1739	3652	1547	1739	1826	1547	1739	4985	1547	3374	3469	1547
Grp Volume(v), veh/h	261	663	0	53	31	0	40	974	24	1207	1126	0
Grp Sat Flow(s),veh/h/ln	1739	1826	1547	1739	1826	1547	1739	1662	1547	1687	1735	1547
Q Serve(g_s), s	21.9	27.5	0.0	4.6	2.5	0.0	3.5	29.7	1.9	55.0	35.9	0.0
Cycle Q Clear(g_c), s	21.9	27.5	0.0	4.6	2.5	0.0	3.5	29.7	1.9	55.0	35.9	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	353	741		123	212		96	1019	316	1047	1797	
V/C Ratio(X)	0.74	0.89		0.43	0.15		0.42	0.96	0.08	1.15	0.63	
Avail Cap(c_a), veh/h	400	841		289	304		311	1116	346	1187	1810	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	70.7	70.7	0.0	71.0	67.2	0.0	77.5	66.8	54.6	61.1	27.8	0.0
Incr Delay (d2), s/veh	6.2	11.1	0.0	2.4	0.3	0.0	1.1	16.9	0.1	80.1	0.8	0.0
Initial Q Delay(d3),s/veh	168.1	73.7	0.0	13.5	0.0	0.0	0.0	0.0	0.0	20.6	0.4	0.0
%ile BackOfQ(50%),veh/ln	12.9	25.3	0.0	3.3	1.2	0.0	1.7	15.1	0.8	37.4	15.6	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	245.0	155.5	0.0	86.9	67.5	0.0	78.6	83.7	54.7	161.9	29.0	0.0
LnGrp LOS	F	F		F	E		E	F	D	F	C	
Approach Vol, veh/h		924			84			1038			2333	
Approach Delay, s/veh		180.8			79.7			82.8			97.8	
Approach LOS		F			E			F			F	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	13.8	88.1		16.5	61.5	40.3		38.0
Change Period (Y+Rc), s	4.7	6.5		6.5	6.5	* 6.5		5.8
Max Green Setting (Gmax), s	12.3	35.0		26.0	55.0	* 35		36.0
Max Q Clear Time (g_c+I1), s	5.5	37.9		6.6	57.0	31.7		29.5
Green Ext Time (p_c), s	0.0	0.0		0.2	0.0	2.1		2.6

Intersection Summary	
HCM 6th Ctrl Delay	111.4
HCM 6th LOS	F

Notes

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th TWSC
1: Devlin Rd & Gateway Rd W/Gateway Rd E

11/14/2023

Intersection	
Int Delay, s/veh	1.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	22	0	11	22	0	7	72	703	47	26	233	122
Future Vol, veh/h	22	0	11	22	0	7	72	703	47	26	233	122
Conflicting Peds, #/hr	1	0	7	6	0	0	7	0	6	0	0	1
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	160	-	370	-	-	-	175	-	-	0	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	5	5	5	5	5	5	5	5	5	5	5	5
Mvmt Flow	23	0	12	23	0	7	76	740	49	27	245	128

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	893	1317	201	1107	1357	402	380	0	0	795	0	0
Stage 1	370	370	-	923	923	-	-	-	-	-	-	-
Stage 2	523	947	-	184	434	-	-	-	-	-	-	-
Critical Hdwy	7.6	6.6	7	7.6	6.6	7	4.2	-	-	4.2	-	-
Critical Hdwy Stg 1	6.6	5.6	-	6.6	5.6	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.6	5.6	-	6.6	5.6	-	-	-	-	-	-	-
Follow-up Hdwy	3.55	4.05	3.35	3.55	4.05	3.35	2.25	-	-	2.25	-	-
Pot Cap-1 Maneuver	232	152	797	161	144	590	1154	-	-	803	-	-
Stage 1	614	611	-	284	340	-	-	-	-	-	-	-
Stage 2	498	331	-	791	572	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	210	135	786	145	128	586	1146	-	-	798	-	-
Mov Cap-2 Maneuver	210	135	-	145	128	-	-	-	-	-	-	-
Stage 1	569	586	-	264	316	-	-	-	-	-	-	-
Stage 2	459	307	-	748	549	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	19.4	29.5	0.7	0.7
HCM LOS	C	D		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	EBLn3	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1146	-	-	210	-	786	177	798	-	-
HCM Lane V/C Ratio	0.066	-	-	0.11	-	0.015	0.172	0.034	-	-
HCM Control Delay (s)	8.4	-	-	24.3	0	9.6	29.5	9.7	-	-
HCM Lane LOS	A	-	-	C	A	A	D	A	-	-
HCM 95th %tile Q(veh)	0.2	-	-	0.4	-	0	0.6	0.1	-	-

HCM 6th Signalized Intersection Summary
2: Devlin Rd & Airport Blvd

11/14/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	58	9	111	171	366	22	450	66	128	79	60
Future Volume (veh/h)	15	58	9	111	171	366	22	450	66	128	79	60
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826
Adj Flow Rate, veh/h	16	61	6	117	180	250	23	474	47	89	147	50
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	5	5	5	5	5	5	5	5	5	5	5	5
Cap, veh/h	48	456	44	191	390	347	379	695	69	237	357	116
Arrive On Green	0.03	0.14	0.14	0.11	0.22	0.22	0.22	0.22	0.22	0.14	0.14	0.14
Sat Flow, veh/h	1739	3195	310	1739	1735	1543	1739	3188	315	1739	2625	856
Grp Volume(v), veh/h	16	33	34	117	180	250	23	257	264	89	100	97
Grp Sat Flow(s),veh/h/ln	1739	1735	1770	1739	1735	1543	1739	1735	1768	1739	1826	1656
Q Serve(g_s), s	0.5	0.9	0.9	3.3	4.7	7.8	0.5	7.1	7.1	2.4	2.6	2.8
Cycle Q Clear(g_c), s	0.5	0.9	0.9	3.3	4.7	7.8	0.5	7.1	7.1	2.4	2.6	2.8
Prop In Lane	1.00		0.17	1.00		1.00	1.00		0.18	1.00		0.52
Lane Grp Cap(c), veh/h	48	248	253	191	390	347	379	378	386	237	248	225
V/C Ratio(X)	0.33	0.13	0.14	0.61	0.46	0.72	0.06	0.68	0.68	0.38	0.40	0.43
Avail Cap(c_a), veh/h	667	999	1019	667	1198	1066	1201	1198	1222	1168	1226	1112
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	24.9	19.5	19.5	22.1	17.5	18.7	16.1	18.7	18.7	20.5	20.6	20.7
Incr Delay (d2), s/veh	1.5	0.1	0.1	1.2	0.3	1.1	0.0	0.8	0.8	0.4	0.4	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.3	0.3	1.2	1.6	2.4	0.2	2.5	2.6	0.9	1.0	1.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	26.3	19.6	19.6	23.3	17.8	19.8	16.2	19.5	19.5	20.9	21.0	21.1
LnGrp LOS	C	B	B	C	B	B	B	B	B	C	C	C
Approach Vol, veh/h		83			547			544			286	
Approach Delay, s/veh		20.9			19.9			19.4			21.0	
Approach LOS		C			B			B			C	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	5.6	17.5		12.5	9.9	13.2		16.5
Change Period (Y+Rc), s	* 4.2	5.8		5.4	* 4.2	5.8		5.1
Max Green Setting (Gmax), s	* 20	36.0		35.0	* 20	30.0		36.0
Max Q Clear Time (g_c+I1), s	2.5	9.8		4.8	5.3	2.9		9.1
Green Ext Time (p_c), s	0.0	1.5		0.8	0.1	0.2		1.9

Intersection Summary	
HCM 6th Ctrl Delay	20.0
HCM 6th LOS	B

Notes

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary
3: SR-29/SR-12/29 & Airport Blvd/SR-12

11/14/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	109	94	60	51	328	1156	204	1388	45	1227	1069	132
Future Volume (veh/h)	109	94	60	51	328	1156	204	1388	45	1227	1069	132
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826
Adj Flow Rate, veh/h	119	93	0	54	345	0	215	1461	24	1292	1125	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	5	5	5	5	5	5	5	5	5	5	5	5
Cap, veh/h	293	154		293	308		236	1454	451	984	1594	
Arrive On Green	0.08	0.08	0.00	0.17	0.17	0.00	0.14	0.29	0.29	0.29	0.46	0.00
Sat Flow, veh/h	3478	1826	1547	1739	1826	1547	1739	4985	1547	3374	3469	1547
Grp Volume(v), veh/h	119	93	0	54	345	0	215	1461	24	1292	1125	0
Grp Sat Flow(s),veh/h/ln	1739	1826	1547	1739	1826	1547	1739	1662	1547	1687	1735	1547
Q Serve(g_s), s	5.0	7.6	0.0	4.1	26.0	0.0	18.8	45.0	1.7	45.0	40.0	0.0
Cycle Q Clear(g_c), s	5.0	7.6	0.0	4.1	26.0	0.0	18.8	45.0	1.7	45.0	40.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	293	154		293	308		236	1454	451	984	1594	
V/C Ratio(X)	0.41	0.60		0.18	1.12		0.91	1.00	0.05	1.31	0.71	
Avail Cap(c_a), veh/h	361	189		293	308		270	1454	451	984	1594	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	67.0	68.2	0.0	55.1	64.2	0.0	65.8	54.6	39.3	54.6	33.4	0.0
Incr Delay (d2), s/veh	0.9	3.8	0.0	0.3	88.1	0.0	28.7	24.8	0.1	148.2	1.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.2	3.7	0.0	1.8	19.2	0.0	10.0	21.4	0.7	38.5	16.3	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	67.9	72.0	0.0	55.3	152.3	0.0	94.5	79.5	39.4	202.9	34.9	0.0
LnGrp LOS	E	E		E	F		F	F	D	F	C	
Approach Vol, veh/h		212			399			1700			2417	
Approach Delay, s/veh		69.7			139.1			80.8			124.7	
Approach LOS		E			F			F			F	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	25.6	77.4		32.5	51.5	51.5		18.8
Change Period (Y+Rc), s	4.7	6.5		6.5	6.5	* 6.5		5.8
Max Green Setting (Gmax), s	24	45.0		26.0	45.0	* 45		16.0
Max Q Clear Time (g_c+I1), s	20.8	42.0		28.0	47.0	47.0		9.6
Green Ext Time (p_c), s	0.1	2.1		0.0	0.0	0.0		0.4

Intersection Summary	
HCM 6th Ctrl Delay	107.7
HCM 6th LOS	F

Notes

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th TWSC
1: Devlin Rd & Gateway Rd W/Gateway Rd E

11/14/2023

Intersection	
Int Delay, s/veh	4.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	32	0	39	63	1	28	13	89	7	12	1417	23
Future Vol, veh/h	32	0	39	63	1	28	13	89	7	12	1417	23
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	160	-	370	-	-	-	175	-	-	0	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	5	5	5	5	5	5	5	5	5	5	5	5
Mvmt Flow	34	0	41	66	1	29	14	94	7	13	1492	24

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1606	1659	758	898	1668	51	1516	0	0	101	0	0
Stage 1	1530	1530	-	126	126	-	-	-	-	-	-	-
Stage 2	76	129	-	772	1542	-	-	-	-	-	-	-
Critical Hdwy	7.6	6.6	7	7.6	6.6	7	4.2	-	-	4.2	-	-
Critical Hdwy Stg 1	6.6	5.6	-	6.6	5.6	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.6	5.6	-	6.6	5.6	-	-	-	-	-	-	-
Follow-up Hdwy	3.55	4.05	3.35	3.55	4.05	3.35	2.25	-	-	2.25	-	-
Pot Cap-1 Maneuver	68	94	343	230	93	996	422	-	-	1468	-	-
Stage 1	119	172	-	856	784	-	-	-	-	-	-	-
Stage 2	916	781	-	352	170	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	63	90	343	196	89	996	422	-	-	1468	-	-
Mov Cap-2 Maneuver	63	90	-	196	89	-	-	-	-	-	-	-
Stage 1	115	170	-	828	758	-	-	-	-	-	-	-
Stage 2	858	755	-	307	168	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	60.9	27.5	1.6	0.1
HCM LOS	F	D		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	EBLn3	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	422	-	-	63	-	343	255	1468	-	-
HCM Lane V/C Ratio	0.032	-	-	0.535	-	0.12	0.38	0.009	-	-
HCM Control Delay (s)	13.8	-	-	114.6	0	16.9	27.5	7.5	-	-
HCM Lane LOS	B	-	-	F	A	C	D	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	2.2	-	0.4	1.7	0	-	-

HCM 6th Signalized Intersection Summary
2: Devlin Rd & Airport Blvd

11/14/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	50	363	51	40	27	40	6	38	78	892	551	16
Future Volume (veh/h)	50	363	51	40	27	40	6	38	78	892	551	16
Initial Q (Qb), veh	5	6	0	0	0	0	0	0	0	30	9	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826
Adj Flow Rate, veh/h	53	382	34	42	28	25	6	40	49	1054	419	16
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	5	5	5	5	5	5	5	5	5	5	5	5
Cap, veh/h	132	551	46	98	286	225	149	148	130	1265	643	21
Arrive On Green	0.07	0.16	0.16	0.06	0.16	0.16	0.09	0.09	0.09	0.37	0.37	0.37
Sat Flow, veh/h	1739	3224	285	1739	1848	1452	1739	1735	1519	3478	1747	67
Grp Volume(v), veh/h	53	205	211	42	26	27	6	40	49	1054	0	435
Grp Sat Flow(s),veh/h/ln	1739	1735	1775	1739	1735	1565	1739	1735	1519	1739	0	1814
Q Serve(g_s), s	1.9	7.1	7.2	1.5	0.8	0.9	0.2	1.4	1.9	17.5	0.0	12.7
Cycle Q Clear(g_c), s	1.9	7.1	7.2	1.5	0.8	0.9	0.2	1.4	1.9	17.5	0.0	12.7
Prop In Lane	1.00		0.16	1.00		0.93	1.00		1.00	1.00		0.04
Lane Grp Cap(c), veh/h	132	295	301	98	269	242	149	148	130	1265	0	664
V/C Ratio(X)	0.40	0.69	0.70	0.43	0.10	0.11	0.04	0.27	0.38	0.83	0.00	0.66
Avail Cap(c_a), veh/h	546	817	836	546	981	884	983	981	859	1911	0	997
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	29.2	25.5	25.5	31.8	25.2	25.3	29.3	29.9	30.1	25.7	0.0	19.1
Incr Delay (d2), s/veh	0.7	1.1	1.1	1.1	0.1	0.1	0.0	0.4	0.7	1.2	0.0	0.4
Initial Q Delay(d3),s/veh	17.2	2.4	2.4	0.0	0.0	0.0	0.0	0.0	0.0	24.2	0.0	3.8
%ile BackOfQ(50%),veh/ln	1.8	3.2	3.3	0.7	0.3	0.4	0.1	0.6	0.8	14.9	0.0	6.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	47.2	29.0	29.0	32.9	25.3	25.3	29.3	30.2	30.8	51.1	0.0	23.3
LnGrp LOS	D	C	C	C	C	C	C	C	C	D	A	C
Approach Vol, veh/h		469			95			95			1489	
Approach Delay, s/veh		31.1			28.7			30.5			43.0	
Approach LOS		C			C			C			D	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	8.5	15.7		28.7	7.9	16.3		10.8
Change Period (Y+Rc), s	* 4.2	5.8		5.4	* 4.2	5.8		5.1
Max Green Setting (Gmax), s	* 20	36.0		35.0	* 20	30.0		36.0
Max Q Clear Time (g_c+I1), s	3.9	2.9		19.5	3.5	9.2		3.9
Green Ext Time (p_c), s	0.0	0.1		3.7	0.0	1.3		0.3

Intersection Summary	
HCM 6th Ctrl Delay	39.2
HCM 6th LOS	D

Notes

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary
3: SR-29/SR-12/29 & Airport Blvd/SR-12

11/14/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	309	785	250	62	37	785	48	1154	63	1430	1333	35
Future Volume (veh/h)	309	785	250	62	37	785	48	1154	63	1430	1333	35
Initial Q (Qb), veh	28	25	0	4	0	0	0	0	0	6	8	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826
Adj Flow Rate, veh/h	325	826	0	65	39	0	51	1215	35	1505	1403	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	5	5	5	5	5	5	5	5	5	5	5	5
Cap, veh/h	353	741		120	223		101	984	314	1047	1735	
Arrive On Green	0.22	0.22	0.00	0.06	0.06	0.00	0.06	0.22	0.22	0.34	0.51	0.00
Sat Flow, veh/h	1739	3652	1547	1739	1826	1547	1739	4985	1547	3374	3469	1547
Grp Volume(v), veh/h	325	826	0	65	39	0	51	1215	35	1505	1403	0
Grp Sat Flow(s),veh/h/ln	1739	1826	1547	1739	1826	1547	1739	1662	1547	1687	1735	1547
Q Serve(g_s), s	28.8	36.0	0.0	5.9	3.3	0.0	4.6	35.0	2.9	55.0	53.9	0.0
Cycle Q Clear(g_c), s	28.8	36.0	0.0	5.9	3.3	0.0	4.6	35.0	2.9	55.0	53.9	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	353	741		120	223		101	984	314	1047	1735	
V/C Ratio(X)	0.92	1.11		0.54	0.18		0.50	1.23	0.11	1.44	0.81	
Avail Cap(c_a), veh/h	388	815		280	294		302	1082	336	1150	1762	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	70.7	70.7	0.0	73.9	67.9	0.0	78.9	71.2	56.1	61.1	35.3	0.0
Incr Delay (d2), s/veh	25.6	68.9	0.0	3.7	0.4	0.0	1.4	114.5	0.2	202.6	3.0	0.0
Initial Q Delay(d3),s/veh	249.7	121.4	0.0	17.4	0.0	0.0	0.0	0.0	0.0	20.6	0.8	0.0
%ile BackOfQ(50%),veh/ln	42.8	36.2	0.0	4.0	1.5	0.0	2.2	24.9	1.2	55.2	24.2	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	346.0	261.0	0.0	95.0	68.2	0.0	80.3	185.7	56.4	284.4	39.1	0.0
LnGrp LOS	F	F		F	E		F	F	E	F	D	
Approach Vol, veh/h		1151			104			1301			2908	
Approach Delay, s/veh		285.0			85.0			178.1			166.1	
Approach LOS		F			F			F			F	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	14.6	88.4		16.5	61.5	41.5		41.8
Change Period (Y+Rc), s	4.7	6.5		6.5	6.5	* 6.5		5.8
Max Green Setting (Gmax), s	23	35.0		26.0	55.0	* 35		36.0
Max Q Clear Time (g_c+I1), s	10.8	55.9		7.9	57.0	37.0		38.0
Green Ext Time (p_c), s	0.0	0.0		0.2	0.0	0.0		0.0

Intersection Summary	
HCM 6th Ctrl Delay	192.4
HCM 6th LOS	F

Notes

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th TWSC
1: Devlin Rd & Gateway Rd W/Gateway Rd E

11/14/2023

Intersection	
Int Delay, s/veh	1.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	18	0	35	18	0	6	66	566	38	21	188	98
Future Vol, veh/h	18	0	35	18	0	6	66	566	38	21	188	98
Conflicting Peds, #/hr	1	0	7	6	0	0	7	0	6	0	0	1
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	160	-	370	-	-	-	175	-	-	0	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	5	5	5	5	5	5	5	5	5	5	5	5
Mvmt Flow	20	0	40	20	0	7	75	643	43	24	214	111

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	798	1167	177	983	1201	350	332	0	0	692	0	0
Stage 1	325	325	-	821	821	-	-	-	-	-	-	-
Stage 2	473	842	-	162	380	-	-	-	-	-	-	-
Critical Hdwy	7.6	6.6	7	7.6	6.6	7	4.2	-	-	4.2	-	-
Critical Hdwy Stg 1	6.6	5.6	-	6.6	5.6	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.6	5.6	-	6.6	5.6	-	-	-	-	-	-	-
Follow-up Hdwy	3.55	4.05	3.35	3.55	4.05	3.35	2.25	-	-	2.25	-	-
Pot Cap-1 Maneuver	272	188	826	199	179	638	1203	-	-	879	-	-
Stage 1	653	640	-	328	380	-	-	-	-	-	-	-
Stage 2	533	371	-	815	605	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	249	169	815	174	161	634	1195	-	-	874	-	-
Mov Cap-2 Maneuver	249	169	-	174	161	-	-	-	-	-	-	-
Stage 1	608	618	-	306	354	-	-	-	-	-	-	-
Stage 2	494	345	-	749	584	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	13.4	24.4	0.8	0.6
HCM LOS	B	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	EBLn3	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1195	-	-	249	-	815	213	874	-	-
HCM Lane V/C Ratio	0.063	-	-	0.082	-	0.049	0.128	0.027	-	-
HCM Control Delay (s)	8.2	-	-	20.7	0	9.6	24.4	9.2	-	-
HCM Lane LOS	A	-	-	C	A	A	C	A	-	-
HCM 95th %tile Q(veh)	0.2	-	-	0.3	-	0.2	0.4	0.1	-	-

HCM 6th Signalized Intersection Summary
2: Devlin Rd & Airport Blvd

11/14/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	12	47	7	89	138	303	18	362	53	129	64	48
Future Volume (veh/h)	12	47	7	89	138	303	18	362	53	129	64	48
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826
Adj Flow Rate, veh/h	13	52	5	99	153	195	20	402	36	166	39	40
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	5	5	5	5	5	5	5	5	5	5	5	5
Cap, veh/h	40	456	43	183	390	347	338	626	56	491	116	119
Arrive On Green	0.02	0.14	0.14	0.11	0.22	0.22	0.19	0.19	0.19	0.14	0.14	0.14
Sat Flow, veh/h	1739	3202	303	1739	1735	1543	1739	3221	287	3478	819	840
Grp Volume(v), veh/h	13	28	29	99	153	195	20	216	222	166	0	79
Grp Sat Flow(s),veh/h/ln	1739	1735	1771	1739	1735	1543	1739	1735	1773	1739	0	1659
Q Serve(g_s), s	0.4	0.7	0.7	2.7	3.7	5.5	0.5	5.6	5.7	2.1	0.0	2.1
Cycle Q Clear(g_c), s	0.4	0.7	0.7	2.7	3.7	5.5	0.5	5.6	5.7	2.1	0.0	2.1
Prop In Lane	1.00		0.17	1.00		1.00	1.00		0.16	1.00		0.51
Lane Grp Cap(c), veh/h	40	247	252	183	390	347	338	337	345	491	0	234
V/C Ratio(X)	0.32	0.11	0.12	0.54	0.39	0.56	0.06	0.64	0.64	0.34	0.00	0.34
Avail Cap(c_a), veh/h	707	1058	1080	707	1269	1129	1272	1269	1297	2474	0	1180
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	23.7	18.4	18.4	20.9	16.2	16.9	16.1	18.2	18.3	19.1	0.0	19.1
Incr Delay (d2), s/veh	1.7	0.1	0.1	0.9	0.2	0.5	0.0	0.8	0.8	0.2	0.0	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.2	0.2	1.0	1.2	1.6	0.2	2.0	2.0	0.7	0.0	0.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	25.4	18.5	18.5	21.8	16.5	17.5	16.2	19.0	19.0	19.2	0.0	19.4
LnGrp LOS	C	B	B	C	B	B	B	B	B	B	A	B
Approach Vol, veh/h		70			447			458			245	
Approach Delay, s/veh		19.8			18.1			18.9			19.3	
Approach LOS		B			B			B			B	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	5.3	16.9		12.3	9.4	12.8		14.7
Change Period (Y+Rc), s	* 4.2	5.8		5.4	* 4.2	5.8		5.1
Max Green Setting (Gmax), s	* 20	36.0		35.0	* 20	30.0		36.0
Max Q Clear Time (g_c+I1), s	2.4	7.5		4.1	4.7	2.7		7.7
Green Ext Time (p_c), s	0.0	1.2		0.6	0.1	0.1		1.5

Intersection Summary	
HCM 6th Ctrl Delay	18.7
HCM 6th LOS	B

Notes

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary
3: SR-29/SR-12/29 & Airport Blvd/SR-12

11/14/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	101	76	61	41	264	931	168	1118	36	988	861	110
Future Volume (veh/h)	101	76	61	41	264	931	168	1118	36	988	861	110
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826
Adj Flow Rate, veh/h	104	78	0	42	272	0	173	1153	14	1019	888	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	5	5	5	5	5	5	5	5	5	5	5	5
Cap, veh/h	305	160		282	296		195	1371	426	1025	1661	
Arrive On Green	0.09	0.09	0.00	0.16	0.16	0.00	0.11	0.28	0.28	0.30	0.48	0.00
Sat Flow, veh/h	3478	1826	1547	1739	1826	1547	1739	4985	1547	3374	3469	1547
Grp Volume(v), veh/h	104	78	0	42	272	0	173	1153	14	1019	888	0
Grp Sat Flow(s),veh/h/ln	1739	1826	1547	1739	1826	1547	1739	1662	1547	1687	1735	1547
Q Serve(g_s), s	4.2	6.0	0.0	3.1	21.7	0.0	14.5	32.3	1.0	44.6	26.5	0.0
Cycle Q Clear(g_c), s	4.2	6.0	0.0	3.1	21.7	0.0	14.5	32.3	1.0	44.6	26.5	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	305	160		282	296		195	1371	426	1025	1661	
V/C Ratio(X)	0.34	0.49		0.15	0.92		0.89	0.84	0.03	0.99	0.53	
Avail Cap(c_a), veh/h	376	197		305	321		282	1515	470	1025	1661	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	63.5	64.3	0.0	53.2	61.0	0.0	64.8	50.6	39.3	51.4	27.0	0.0
Incr Delay (d2), s/veh	0.7	2.3	0.0	0.2	29.0	0.0	15.8	4.4	0.0	26.5	0.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.8	2.9	0.0	1.3	12.1	0.0	7.1	13.5	0.4	21.7	10.5	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	64.1	66.6	0.0	53.5	90.0	0.0	80.6	55.0	39.3	77.9	27.5	0.0
LnGrp LOS	E	E		D	F		F	D	D	E	C	
Approach Vol, veh/h		182			314			1340			1907	
Approach Delay, s/veh		65.2			85.1			58.1			54.4	
Approach LOS		E			F			E			D	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	21.3	77.4		30.5	51.5	47.2		18.8
Change Period (Y+Rc), s	4.7	6.5		6.5	6.5	* 6.5		5.8
Max Green Setting (Gmax), s	24.6	45.0		26.0	45.0	* 45		16.0
Max Q Clear Time (g_c+I1), s	16.5	28.5		23.7	46.6	34.3		8.0
Green Ext Time (p_c), s	0.1	6.7		0.3	0.0	6.4		0.4

Intersection Summary	
HCM 6th Ctrl Delay	58.8
HCM 6th LOS	E

Notes

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th TWSC
1: Devlin Rd & Gateway Rd W/Gateway Rd E

11/14/2023

Intersection	
Int Delay, s/veh	3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	26	0	58	52	1	23	19	73	6	10	1161	19
Future Vol, veh/h	26	0	58	52	1	23	19	73	6	10	1161	19
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	160	-	370	-	-	-	175	-	-	0	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	5	5	5	5	5	5	5	5	5	5	5	5
Mvmt Flow	28	0	62	56	1	25	20	78	6	11	1248	20

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1360	1404	634	767	1411	42	1268	0	0	84	0	0
Stage 1	1280	1280	-	121	121	-	-	-	-	-	-	-
Stage 2	80	124	-	646	1290	-	-	-	-	-	-	-
Critical Hdwy	7.6	6.6	7	7.6	6.6	7	4.2	-	-	4.2	-	-
Critical Hdwy Stg 1	6.6	5.6	-	6.6	5.6	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.6	5.6	-	6.6	5.6	-	-	-	-	-	-	-
Follow-up Hdwy	3.55	4.05	3.35	3.55	4.05	3.35	2.25	-	-	2.25	-	-
Pot Cap-1 Maneuver	104	135	415	286	133	1010	528	-	-	1489	-	-
Stage 1	171	229	-	862	788	-	-	-	-	-	-	-
Stage 2	911	785	-	420	226	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	97	129	415	235	127	1010	528	-	-	1489	-	-
Mov Cap-2 Maneuver	97	129	-	235	127	-	-	-	-	-	-	-
Stage 1	165	227	-	829	758	-	-	-	-	-	-	-
Stage 2	854	755	-	354	224	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	28	21.3	2.3	0.1
HCM LOS	D	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	EBLn3	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	528	-	-	97	-	415	302	1489	-	-
HCM Lane V/C Ratio	0.039	-	-	0.288	-	0.15	0.271	0.007	-	-
HCM Control Delay (s)	12.1	-	-	56.5	0	15.2	21.3	7.4	-	-
HCM Lane LOS	B	-	-	F	A	C	C	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	1.1	-	0.5	1.1	0	-	-

HCM 6th Signalized Intersection Summary
2: Devlin Rd & Airport Blvd

11/14/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	41	297	42	33	22	41	5	31	64	757	451	13
Future Volume (veh/h)	41	297	42	33	22	41	5	31	64	757	451	13
Initial Q (Qb), veh	5	6	0	0	0	0	0	0	0	30	9	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826
Adj Flow Rate, veh/h	43	309	24	34	23	26	5	32	35	869	359	13
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	5	5	5	5	5	5	5	5	5	5	5	5
Cap, veh/h	124	500	36	89	240	214	146	146	128	1172	579	19
Arrive On Green	0.06	0.15	0.15	0.05	0.14	0.14	0.09	0.09	0.09	0.32	0.32	0.32
Sat Flow, veh/h	1739	3263	252	1739	1735	1547	1739	1735	1521	3478	1751	63
Grp Volume(v), veh/h	43	163	170	34	23	26	5	32	35	869	0	372
Grp Sat Flow(s),veh/h/ln	1739	1735	1781	1739	1735	1547	1739	1735	1521	1739	0	1814
Q Serve(g_s), s	1.3	4.7	4.7	1.0	0.6	0.8	0.1	0.9	1.1	11.8	0.0	9.2
Cycle Q Clear(g_c), s	1.3	4.7	4.7	1.0	0.6	0.8	0.1	0.9	1.1	11.8	0.0	9.2
Prop In Lane	1.00		0.14	1.00		1.00	1.00		1.00	1.00		0.03
Lane Grp Cap(c), veh/h	124	264	271	89	240	214	146	146	128	1172	0	599
V/C Ratio(X)	0.35	0.62	0.63	0.38	0.10	0.12	0.03	0.22	0.27	0.74	0.00	0.62
Avail Cap(c_a), veh/h	661	989	1015	661	1186	1058	1189	1186	1040	2312	0	1206
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	24.6	21.5	21.5	26.3	21.5	21.6	24.2	24.6	24.7	20.3	0.0	17.0
Incr Delay (d2), s/veh	0.6	0.9	0.9	1.0	0.1	0.1	0.0	0.3	0.4	0.4	0.0	0.4
Initial Q Delay(d3),s/veh	18.0	2.4	2.3	0.0	0.0	0.0	0.0	0.0	0.0	18.2	0.0	4.3
%ile BackOfQ(50%),veh/ln	1.6	2.2	2.2	0.4	0.2	0.3	0.1	0.4	0.4	9.7	0.0	5.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	43.2	24.8	24.7	27.3	21.6	21.7	24.2	24.9	25.1	38.8	0.0	21.6
LnGrp LOS	D	C	C	C	C	C	C	C	C	D	A	C
Approach Vol, veh/h		376			83			72			1241	
Approach Delay, s/veh		26.9			24.0			25.0			33.7	
Approach LOS		C			C			C			C	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	7.5	13.0		22.5	6.9	13.5		9.7
Change Period (Y+Rc), s	* 4.2	5.8		5.4	* 4.2	5.8		5.1
Max Green Setting (Gmax), s	* 20	36.0		35.0	* 20	30.0		36.0
Max Q Clear Time (g_c+I1), s	3.3	2.8		13.8	3.0	6.7		3.1
Green Ext Time (p_c), s	0.0	0.1		3.1	0.0	1.0		0.2

Intersection Summary			
HCM 6th Ctrl Delay			31.4
HCM 6th LOS			C

Notes

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary
3: SR-29/SR-12/29 & Airport Blvd/SR-12

11/14/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	266	643	218	51	30	643	43	945	52	1171	1092	33
Future Volume (veh/h)	266	643	218	51	30	643	43	945	52	1171	1092	33
Initial Q (Qb), veh	28	25	0	4	0	0	0	0	0	6	8	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826
Adj Flow Rate, veh/h	274	663	0	53	31	0	44	974	24	1207	1126	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	5	5	5	5	5	5	5	5	5	5	5	5
Cap, veh/h	353	741		123	212		99	1019	316	1047	1790	
Arrive On Green	0.21	0.21	0.00	0.06	0.06	0.00	0.06	0.22	0.22	0.35	0.52	0.00
Sat Flow, veh/h	1739	3652	1547	1739	1826	1547	1739	4985	1547	3374	3469	1547
Grp Volume(v), veh/h	274	663	0	53	31	0	44	974	24	1207	1126	0
Grp Sat Flow(s),veh/h/ln	1739	1826	1547	1739	1826	1547	1739	1662	1547	1687	1735	1547
Q Serve(g_s), s	23.2	27.5	0.0	4.6	2.5	0.0	3.8	29.8	1.9	55.0	36.1	0.0
Cycle Q Clear(g_c), s	23.2	27.5	0.0	4.6	2.5	0.0	3.8	29.8	1.9	55.0	36.1	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	353	741		123	212		99	1019	316	1047	1790	
V/C Ratio(X)	0.78	0.89		0.43	0.15		0.45	0.96	0.08	1.15	0.63	
Avail Cap(c_a), veh/h	400	841		289	304		311	1116	346	1187	1803	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	70.7	70.7	0.0	71.0	67.2	0.0	77.4	66.8	54.6	61.1	28.1	0.0
Incr Delay (d2), s/veh	8.2	11.1	0.0	2.4	0.3	0.0	1.2	16.9	0.1	80.1	0.8	0.0
Initial Q Delay(d3),s/veh	184.7	73.7	0.0	13.5	0.0	0.0	0.0	0.0	0.0	20.6	0.4	0.0
%ile BackOfQ(50%),veh/ln	14.7	25.3	0.0	3.3	1.2	0.0	1.9	15.1	0.8	37.4	15.6	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	263.6	155.5	0.0	86.9	67.5	0.0	78.6	83.7	54.7	161.9	29.3	0.0
LnGrp LOS	F	F		F	E		E	F	D	F	C	
Approach Vol, veh/h		937			84			1042			2333	
Approach Delay, s/veh		187.1			79.8			82.8			97.9	
Approach LOS		F			E			F			F	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	14.1	87.8		16.5	61.5	40.4		38.0
Change Period (Y+Rc), s	4.7	6.5		6.5	6.5	* 6.5		5.8
Max Green Setting (Gmax), s	23	35.0		26.0	55.0	* 35		36.0
Max Q Clear Time (g_c+I1), s	5.8	38.1		6.6	57.0	31.8		29.5
Green Ext Time (p_c), s	0.0	0.0		0.2	0.0	2.1		2.7

Intersection Summary			
HCM 6th Ctrl Delay			113.0
HCM 6th LOS			F

Notes

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th TWSC
1: Devlin Rd & Gateway Rd W/Gateway Rd E

11/14/2023

Intersection	
Int Delay, s/veh	1.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	18	0	11	18	0	6	67	566	38	21	188	98
Future Vol, veh/h	18	0	11	18	0	6	67	566	38	21	188	98
Conflicting Peds, #/hr	1	0	7	6	0	0	7	0	6	0	0	1
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	160	-	370	-	-	-	175	-	-	0	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	5	5	5	5	5	5	5	5	5	5	5	5
Mvmt Flow	20	0	13	20	0	7	76	643	43	24	214	111

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	800	1169	177	985	1203	350	332	0	0	692	0	0
Stage 1	325	325	-	823	823	-	-	-	-	-	-	-
Stage 2	475	844	-	162	380	-	-	-	-	-	-	-
Critical Hdwy	7.6	6.6	7	7.6	6.6	7	4.2	-	-	4.2	-	-
Critical Hdwy Stg 1	6.6	5.6	-	6.6	5.6	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.6	5.6	-	6.6	5.6	-	-	-	-	-	-	-
Follow-up Hdwy	3.55	4.05	3.35	3.55	4.05	3.35	2.25	-	-	2.25	-	-
Pot Cap-1 Maneuver	271	187	826	198	179	638	1203	-	-	879	-	-
Stage 1	653	640	-	327	379	-	-	-	-	-	-	-
Stage 2	532	370	-	815	605	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	248	168	815	179	161	634	1195	-	-	874	-	-
Mov Cap-2 Maneuver	248	168	-	179	161	-	-	-	-	-	-	-
Stage 1	607	618	-	304	352	-	-	-	-	-	-	-
Stage 2	492	344	-	775	584	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	16.5	23.9	0.8	0.6
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	EBLn3	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1195	-	-	248	-	815	218	874	-	-
HCM Lane V/C Ratio	0.064	-	-	0.082	-	0.015	0.125	0.027	-	-
HCM Control Delay (s)	8.2	-	-	20.8	0	9.5	23.9	9.2	-	-
HCM Lane LOS	A	-	-	C	A	A	C	A	-	-
HCM 95th %tile Q(veh)	0.2	-	-	0.3	-	0	0.4	0.1	-	-

HCM 6th Signalized Intersection Summary
2: Devlin Rd & Airport Blvd

11/14/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	12	47	7	89	138	304	18	362	53	105	64	48
Future Volume (veh/h)	12	47	7	89	138	304	18	362	53	105	64	48
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826
Adj Flow Rate, veh/h	13	52	5	99	153	196	20	402	36	76	129	40
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	5	5	5	5	5	5	5	5	5	5	5	5
Cap, veh/h	40	456	43	183	390	347	338	626	56	245	380	113
Arrive On Green	0.02	0.14	0.14	0.11	0.22	0.22	0.19	0.19	0.19	0.14	0.14	0.14
Sat Flow, veh/h	1739	3202	303	1739	1735	1543	1739	3221	287	1739	2692	801
Grp Volume(v), veh/h	13	28	29	99	153	196	20	216	222	76	86	83
Grp Sat Flow(s),veh/h/ln	1739	1735	1771	1739	1735	1543	1739	1735	1773	1739	1826	1667
Q Serve(g_s), s	0.4	0.7	0.7	2.7	3.7	5.6	0.5	5.6	5.7	1.9	2.1	2.2
Cycle Q Clear(g_c), s	0.4	0.7	0.7	2.7	3.7	5.6	0.5	5.6	5.7	1.9	2.1	2.2
Prop In Lane	1.00		0.17	1.00		1.00	1.00		0.16	1.00		0.48
Lane Grp Cap(c), veh/h	40	247	252	183	390	347	338	337	345	245	258	235
V/C Ratio(X)	0.32	0.11	0.12	0.54	0.39	0.57	0.06	0.64	0.64	0.31	0.33	0.35
Avail Cap(c_a), veh/h	707	1058	1080	707	1269	1129	1272	1269	1297	1237	1299	1186
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	23.7	18.4	18.4	20.9	16.2	16.9	16.1	18.2	18.3	19.0	19.0	19.1
Incr Delay (d2), s/veh	1.7	0.1	0.1	0.9	0.2	0.5	0.0	0.8	0.8	0.3	0.3	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.2	0.2	1.0	1.2	1.6	0.2	2.0	2.0	0.7	0.8	0.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	25.4	18.5	18.5	21.8	16.5	17.5	16.2	19.0	19.0	19.2	19.3	19.4
LnGrp LOS	C	B	B	C	B	B	B	B	B	B	B	B
Approach Vol, veh/h		70			448			458			245	
Approach Delay, s/veh		19.8			18.1			18.9			19.3	
Approach LOS		B			B			B			B	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	5.3	16.9		12.3	9.4	12.8		14.7
Change Period (Y+Rc), s	* 4.2	5.8		5.4	* 4.2	5.8		5.1
Max Green Setting (Gmax), s	* 20	36.0		35.0	* 20	30.0		36.0
Max Q Clear Time (g_c+I1), s	2.4	7.6		4.2	4.7	2.7		7.7
Green Ext Time (p_c), s	0.0	1.2		0.6	0.1	0.1		1.5

Intersection Summary	
HCM 6th Ctrl Delay	18.7
HCM 6th LOS	B

Notes

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary
3: SR-29/SR-12/29 & Airport Blvd/SR-12

11/14/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	89	76	49	41	264	931	168	1118	36	988	861	111
Future Volume (veh/h)	89	76	49	41	264	931	168	1118	36	988	861	111
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826
Adj Flow Rate, veh/h	95	74	0	42	272	0	173	1153	14	1019	888	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	5	5	5	5	5	5	5	5	5	5	5	5
Cap, veh/h	305	160		282	296		195	1371	426	1025	1661	
Arrive On Green	0.09	0.09	0.00	0.16	0.16	0.00	0.11	0.28	0.28	0.30	0.48	0.00
Sat Flow, veh/h	3478	1826	1547	1739	1826	1547	1739	4985	1547	3374	3469	1547
Grp Volume(v), veh/h	95	74	0	42	272	0	173	1153	14	1019	888	0
Grp Sat Flow(s),veh/h/ln	1739	1826	1547	1739	1826	1547	1739	1662	1547	1687	1735	1547
Q Serve(g_s), s	3.8	5.7	0.0	3.1	21.7	0.0	14.5	32.3	1.0	44.6	26.5	0.0
Cycle Q Clear(g_c), s	3.8	5.7	0.0	3.1	21.7	0.0	14.5	32.3	1.0	44.6	26.5	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	305	160		282	296		195	1371	426	1025	1661	
V/C Ratio(X)	0.31	0.46		0.15	0.92		0.89	0.84	0.03	0.99	0.53	
Avail Cap(c_a), veh/h	376	197		305	321		282	1515	470	1025	1661	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	63.3	64.2	0.0	53.2	61.0	0.0	64.8	50.6	39.3	51.4	27.0	0.0
Incr Delay (d2), s/veh	0.6	2.1	0.0	0.2	29.0	0.0	15.8	4.4	0.0	26.5	0.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.7	2.7	0.0	1.3	12.1	0.0	7.1	13.5	0.4	21.7	10.5	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	63.9	66.3	0.0	53.5	90.0	0.0	80.6	55.0	39.3	77.9	27.5	0.0
LnGrp LOS	E	E		D	F		F	D	D	E	C	
Approach Vol, veh/h		169			314			1340			1907	
Approach Delay, s/veh		64.9			85.1			58.1			54.4	
Approach LOS		E			F			E			D	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	21.3	77.4		30.5	51.5	47.2		18.8
Change Period (Y+Rc), s	4.7	6.5		6.5	6.5	* 6.5		5.8
Max Green Setting (Gmax), s	24.6	45.0		26.0	45.0	* 45		16.0
Max Q Clear Time (g_c+I1), s	16.5	28.5		23.7	46.6	34.3		7.7
Green Ext Time (p_c), s	0.1	6.7		0.3	0.0	6.4		0.4

Intersection Summary	
HCM 6th Ctrl Delay	58.8
HCM 6th LOS	E

Notes

User approved volume balancing among the lanes for turning movement.
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.
Unsignalized Delay for [EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th TWSC
1: Devlin Rd & Gateway Rd W/Gateway Rd E

11/14/2023

Intersection	
Int Delay, s/veh	2.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	26	0	41	52	1	23	14	73	6	10	1161	19
Future Vol, veh/h	26	0	41	52	1	23	14	73	6	10	1161	19
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	160	-	370	-	-	-	175	-	-	0	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	5	5	5	5	5	5	5	5	5	5	5	5
Mvmt Flow	28	0	44	56	1	25	15	78	6	11	1248	20

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1350	1394	634	757	1401	42	1268	0	0	84	0	0
Stage 1	1280	1280	-	111	111	-	-	-	-	-	-	-
Stage 2	70	114	-	646	1290	-	-	-	-	-	-	-
Critical Hdwy	7.6	6.6	7	7.6	6.6	7	4.2	-	-	4.2	-	-
Critical Hdwy Stg 1	6.6	5.6	-	6.6	5.6	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.6	5.6	-	6.6	5.6	-	-	-	-	-	-	-
Follow-up Hdwy	3.55	4.05	3.35	3.55	4.05	3.35	2.25	-	-	2.25	-	-
Pot Cap-1 Maneuver	106	137	415	291	135	1010	528	-	-	1489	-	-
Stage 1	171	229	-	873	796	-	-	-	-	-	-	-
Stage 2	923	793	-	420	226	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	100	132	415	253	130	1010	528	-	-	1489	-	-
Mov Cap-2 Maneuver	100	132	-	253	130	-	-	-	-	-	-	-
Stage 1	166	227	-	849	774	-	-	-	-	-	-	-
Stage 2	874	771	-	373	224	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	30.1	19.9	1.8	0.1
HCM LOS	D	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	EBLn3	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	528	-	-	100	-	415	322	1489	-	-
HCM Lane V/C Ratio	0.029	-	-	0.28	-	0.106	0.254	0.007	-	-
HCM Control Delay (s)	12	-	-	54.4	0	14.7	19.9	7.4	-	-
HCM Lane LOS	B	-	-	F	A	B	C	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	1	-	0.4	1	0	-	-

HCM 6th Signalized Intersection Summary
2: Devlin Rd & Airport Blvd

11/14/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	41	297	42	33	22	36	5	31	64	740	451	13
Future Volume (veh/h)	41	297	42	33	22	36	5	31	64	740	451	13
Initial Q (Qb), veh	5	6	0	0	0	0	0	0	0	30	9	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826
Adj Flow Rate, veh/h	43	309	24	34	23	21	5	32	35	859	347	13
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	5	5	5	5	5	5	5	5	5	5	5	5
Cap, veh/h	124	501	36	89	254	203	146	146	128	1163	573	19
Arrive On Green	0.06	0.15	0.15	0.05	0.14	0.14	0.09	0.09	0.09	0.32	0.32	0.32
Sat Flow, veh/h	1739	3263	252	1739	1832	1465	1739	1735	1521	3478	1749	66
Grp Volume(v), veh/h	43	163	170	34	22	22	5	32	35	859	0	360
Grp Sat Flow(s),veh/h/ln	1739	1735	1781	1739	1735	1562	1739	1735	1521	1739	0	1814
Q Serve(g_s), s	1.2	4.6	4.7	1.0	0.6	0.7	0.1	0.9	1.1	11.6	0.0	8.8
Cycle Q Clear(g_c), s	1.2	4.6	4.7	1.0	0.6	0.7	0.1	0.9	1.1	11.6	0.0	8.8
Prop In Lane	1.00		0.14	1.00		0.94	1.00		1.00	1.00		0.04
Lane Grp Cap(c), veh/h	124	265	272	89	240	217	146	146	128	1163	0	593
V/C Ratio(X)	0.35	0.62	0.62	0.38	0.09	0.10	0.03	0.22	0.27	0.74	0.00	0.61
Avail Cap(c_a), veh/h	665	995	1021	665	1194	1075	1197	1194	1047	2327	0	1214
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	24.5	21.4	21.4	26.2	21.3	21.4	24.0	24.4	24.5	20.1	0.0	16.8
Incr Delay (d2), s/veh	0.6	0.9	0.9	1.0	0.1	0.1	0.0	0.3	0.4	0.3	0.0	0.4
Initial Q Delay(d3),s/veh	17.9	2.4	2.3	0.0	0.0	0.0	0.0	0.0	0.0	18.3	0.0	4.2
%ile BackOfQ(50%),veh/ln	1.6	2.1	2.2	0.4	0.2	0.2	0.1	0.4	0.4	9.6	0.0	5.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	43.0	24.6	24.6	27.2	21.4	21.5	24.1	24.7	24.9	38.8	0.0	21.4
LnGrp LOS	D	C	C	C	C	C	C	C	C	D	A	C
Approach Vol, veh/h		376			78			72			1219	
Approach Delay, s/veh		26.7			23.9			24.8			33.7	
Approach LOS		C			C			C			C	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	7.5	13.0		22.2	6.9	13.5		9.6
Change Period (Y+Rc), s	* 4.2	5.8		5.4	* 4.2	5.8		5.1
Max Green Setting (Gmax), s	* 20	36.0		35.0	* 20	30.0		36.0
Max Q Clear Time (g_c+I1), s	3.2	2.7		13.6	3.0	6.7		3.1
Green Ext Time (p_c), s	0.0	0.1		3.1	0.0	1.0		0.2

Intersection Summary	
HCM 6th Ctrl Delay	31.4
HCM 6th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary
3: SR-29/SR-12/29 & Airport Blvd/SR-12

11/14/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	258	643	209	51	30	643	41	945	52	1171	1092	30
Future Volume (veh/h)	258	643	209	51	30	643	41	945	52	1171	1092	30
Initial Q (Qb), veh	28	25	0	4	0	0	0	0	0	6	8	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826
Adj Flow Rate, veh/h	266	663	0	53	31	0	42	974	24	1207	1126	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	5	5	5	5	5	5	5	5	5	5	5	5
Cap, veh/h	353	741		123	212		97	1019	316	1047	1794	
Arrive On Green	0.21	0.21	0.00	0.06	0.06	0.00	0.06	0.22	0.22	0.35	0.52	0.00
Sat Flow, veh/h	1739	3652	1547	1739	1826	1547	1739	4985	1547	3374	3469	1547
Grp Volume(v), veh/h	266	663	0	53	31	0	42	974	24	1207	1126	0
Grp Sat Flow(s),veh/h/ln	1739	1826	1547	1739	1826	1547	1739	1662	1547	1687	1735	1547
Q Serve(g_s), s	22.4	27.5	0.0	4.6	2.5	0.0	3.6	29.7	1.9	55.0	36.0	0.0
Cycle Q Clear(g_c), s	22.4	27.5	0.0	4.6	2.5	0.0	3.6	29.7	1.9	55.0	36.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	353	741		123	212		97	1019	316	1047	1794	
V/C Ratio(X)	0.75	0.89		0.43	0.15		0.43	0.96	0.08	1.15	0.63	
Avail Cap(c_a), veh/h	400	841		289	304		311	1116	346	1187	1807	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	70.7	70.7	0.0	71.0	67.2	0.0	77.4	66.8	54.6	61.1	28.0	0.0
Incr Delay (d2), s/veh	6.9	11.1	0.0	2.4	0.3	0.0	1.1	16.9	0.1	80.1	0.8	0.0
Initial Q Delay(d3),s/veh	174.5	73.7	0.0	13.5	0.0	0.0	0.0	0.0	0.0	20.6	0.4	0.0
%ile BackOfQ(50%),veh/ln	13.6	25.3	0.0	3.3	1.2	0.0	1.8	15.1	0.8	37.4	15.6	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	252.1	155.5	0.0	86.9	67.5	0.0	78.6	83.7	54.7	161.9	29.2	0.0
LnGrp LOS	F	F		F	E		E	F	D	F	C	
Approach Vol, veh/h		929			84			1040			2333	
Approach Delay, s/veh		183.2			79.7			82.8			97.9	
Approach LOS		F			E			F			F	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	13.9	87.9		16.5	61.5	40.3		38.0
Change Period (Y+Rc), s	4.7	6.5		6.5	6.5	* 6.5		5.8
Max Green Setting (Gmax), s	23	35.0		26.0	55.0	* 35		36.0
Max Q Clear Time (g_c+I1), s	5.6	38.0		6.6	57.0	31.7		29.5
Green Ext Time (p_c), s	0.0	0.0		0.2	0.0	2.1		2.7

Intersection Summary	
HCM 6th Ctrl Delay	112.0
HCM 6th LOS	F

Notes

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th TWSC
1: Devlin Rd & Gateway Rd W/Gateway Rd E

11/14/2023

Intersection	
Int Delay, s/veh	2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	18	0	37	18	0	6	75	566	38	21	188	98
Future Vol, veh/h	18	0	37	18	0	6	75	566	38	21	188	98
Conflicting Peds, #/hr	1	0	7	6	0	0	7	0	6	0	0	1
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	160	-	370	-	-	-	175	-	-	0	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	5	5	5	5	5	5	5	5	5	5	5	5
Mvmt Flow	20	0	42	20	0	7	85	643	43	24	214	111

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	818	1187	177	1003	1221	350	332	0	0	692	0	0
Stage 1	325	325	-	841	841	-	-	-	-	-	-	-
Stage 2	493	862	-	162	380	-	-	-	-	-	-	-
Critical Hdwy	7.6	6.6	7	7.6	6.6	7	4.2	-	-	4.2	-	-
Critical Hdwy Stg 1	6.6	5.6	-	6.6	5.6	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.6	5.6	-	6.6	5.6	-	-	-	-	-	-	-
Follow-up Hdwy	3.55	4.05	3.35	3.55	4.05	3.35	2.25	-	-	2.25	-	-
Pot Cap-1 Maneuver	263	183	826	192	174	638	1203	-	-	879	-	-
Stage 1	653	640	-	319	372	-	-	-	-	-	-	-
Stage 2	519	363	-	815	605	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	239	163	815	166	155	634	1195	-	-	874	-	-
Mov Cap-2 Maneuver	239	163	-	166	155	-	-	-	-	-	-	-
Stage 1	603	618	-	295	343	-	-	-	-	-	-	-
Stage 2	476	335	-	747	584	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	13.6	25.4	0.9	0.6
HCM LOS	B	D		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	EBLn3	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1195	-	-	239	-	815	204	874	-	-
HCM Lane V/C Ratio	0.071	-	-	0.086	-	0.052	0.134	0.027	-	-
HCM Control Delay (s)	8.2	-	-	21.5	0	9.7	25.4	9.2	-	-
HCM Lane LOS	A	-	-	C	A	A	D	A	-	-
HCM 95th %tile Q(veh)	0.2	-	-	0.3	-	0.2	0.5	0.1	-	-

HCM 6th Signalized Intersection Summary
2: Devlin Rd & Airport Blvd

11/14/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	12	47	7	89	138	312	18	362	53	131	64	48
Future Volume (veh/h)	12	47	7	89	138	312	18	362	53	131	64	48
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826
Adj Flow Rate, veh/h	13	52	5	99	153	205	20	402	36	168	41	40
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	5	5	5	5	5	5	5	5	5	5	5	5
Cap, veh/h	40	455	43	183	389	347	338	626	56	492	119	116
Arrive On Green	0.02	0.14	0.14	0.11	0.22	0.22	0.19	0.19	0.19	0.14	0.14	0.14
Sat Flow, veh/h	1739	3202	303	1739	1735	1543	1739	3221	287	3478	842	821
Grp Volume(v), veh/h	13	28	29	99	153	205	20	216	222	168	0	81
Grp Sat Flow(s),veh/h/ln	1739	1735	1771	1739	1735	1543	1739	1735	1773	1739	0	1663
Q Serve(g_s), s	0.4	0.7	0.7	2.7	3.7	5.8	0.5	5.6	5.7	2.1	0.0	2.2
Cycle Q Clear(g_c), s	0.4	0.7	0.7	2.7	3.7	5.8	0.5	5.6	5.7	2.1	0.0	2.2
Prop In Lane	1.00		0.17	1.00		1.00	1.00		0.16	1.00		0.49
Lane Grp Cap(c), veh/h	40	247	252	183	389	347	338	337	345	492	0	235
V/C Ratio(X)	0.32	0.11	0.12	0.54	0.39	0.59	0.06	0.64	0.64	0.34	0.00	0.34
Avail Cap(c_a), veh/h	707	1057	1080	707	1269	1129	1272	1269	1297	2473	0	1182
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	23.7	18.4	18.4	20.9	16.2	17.1	16.2	18.2	18.3	19.1	0.0	19.1
Incr Delay (d2), s/veh	1.7	0.1	0.1	0.9	0.2	0.6	0.0	0.8	0.8	0.2	0.0	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.2	0.2	1.0	1.2	1.7	0.2	2.0	2.0	0.8	0.0	0.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	25.4	18.5	18.5	21.8	16.5	17.7	16.2	19.0	19.0	19.2	0.0	19.4
LnGrp LOS	C	B	B	C	B	B	B	B	B	B	A	B
Approach Vol, veh/h		70			457			458			249	
Approach Delay, s/veh		19.8			18.2			18.9			19.3	
Approach LOS		B			B			B			B	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	5.3	16.9		12.4	9.4	12.8		14.7
Change Period (Y+Rc), s	* 4.2	5.8		5.4	* 4.2	5.8		5.1
Max Green Setting (Gmax), s	* 20	36.0		35.0	* 20	30.0		36.0
Max Q Clear Time (g_c+I1), s	2.4	7.8		4.2	4.7	2.7		7.7
Green Ext Time (p_c), s	0.0	1.3		0.6	0.1	0.1		1.5

Intersection Summary	
HCM 6th Ctrl Delay	18.7
HCM 6th LOS	B

Notes

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary
3: SR-29/SR-12/29 & Airport Blvd/SR-12

11/14/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	102	76	62	41	264	931	172	1118	36	988	861	115
Future Volume (veh/h)	102	76	62	41	264	931	172	1118	36	988	861	115
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826
Adj Flow Rate, veh/h	105	78	0	42	272	0	177	1153	14	1019	888	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	5	5	5	5	5	5	5	5	5	5	5	5
Cap, veh/h	305	160		282	296		199	1371	426	1025	1653	
Arrive On Green	0.09	0.09	0.00	0.16	0.16	0.00	0.11	0.28	0.28	0.30	0.48	0.00
Sat Flow, veh/h	3478	1826	1547	1739	1826	1547	1739	4985	1547	3374	3469	1547
Grp Volume(v), veh/h	105	78	0	42	272	0	177	1153	14	1019	888	0
Grp Sat Flow(s),veh/h/ln	1739	1826	1547	1739	1826	1547	1739	1662	1547	1687	1735	1547
Q Serve(g_s), s	4.2	6.0	0.0	3.1	21.7	0.0	14.9	32.3	1.0	44.6	26.7	0.0
Cycle Q Clear(g_c), s	4.2	6.0	0.0	3.1	21.7	0.0	14.9	32.3	1.0	44.6	26.7	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	305	160		282	296		199	1371	426	1025	1653	
V/C Ratio(X)	0.34	0.49		0.15	0.92		0.89	0.84	0.03	0.99	0.54	
Avail Cap(c_a), veh/h	376	197		305	321		282	1515	470	1025	1653	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	63.5	64.3	0.0	53.2	61.0	0.0	64.6	50.6	39.3	51.4	27.3	0.0
Incr Delay (d2), s/veh	0.7	2.3	0.0	0.2	29.0	0.0	17.0	4.4	0.0	26.5	0.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.9	2.9	0.0	1.3	12.1	0.0	7.3	13.5	0.4	21.7	10.6	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	64.2	66.6	0.0	53.5	90.0	0.0	81.6	55.0	39.3	77.9	27.7	0.0
LnGrp LOS	E	E		D	F		F	D	D	E	C	
Approach Vol, veh/h		183			314			1344			1907	
Approach Delay, s/veh		65.2			85.1			58.3			54.5	
Approach LOS		E			F			E			D	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	21.7	77.1		30.5	51.5	47.2		18.8
Change Period (Y+Rc), s	4.7	6.5		6.5	6.5	* 6.5		5.8
Max Green Setting (Gmax), s	24.4	45.0		26.0	45.0	* 45		16.0
Max Q Clear Time (g_c+I1), s	16.9	28.7		23.7	46.6	34.3		8.0
Green Ext Time (p_c), s	0.1	6.7		0.3	0.0	6.4		0.4

Intersection Summary		
HCM 6th Ctrl Delay		59.0
HCM 6th LOS		E

Notes

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th TWSC
1: Devlin Rd & Gateway Rd W/Gateway Rd E

11/14/2023

Intersection	
Int Delay, s/veh	3.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	26	0	67	52	1	23	22	73	6	10	1161	19
Future Vol, veh/h	26	0	67	52	1	23	22	73	6	10	1161	19
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	160	-	370	-	-	-	175	-	-	0	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	5	5	5	5	5	5	5	5	5	5	5	5
Mvmt Flow	28	0	72	56	1	25	24	78	6	11	1248	20

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1368	1412	634	775	1419	42	1268	0	0	84	0	0
Stage 1	1280	1280	-	129	129	-	-	-	-	-	-	-
Stage 2	88	132	-	646	1290	-	-	-	-	-	-	-
Critical Hdwy	7.6	6.6	7	7.6	6.6	7	4.2	-	-	4.2	-	-
Critical Hdwy Stg 1	6.6	5.6	-	6.6	5.6	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.6	5.6	-	6.6	5.6	-	-	-	-	-	-	-
Follow-up Hdwy	3.55	4.05	3.35	3.55	4.05	3.35	2.25	-	-	2.25	-	-
Pot Cap-1 Maneuver	103	133	415	282	132	1010	528	-	-	1489	-	-
Stage 1	171	229	-	852	781	-	-	-	-	-	-	-
Stage 2	901	779	-	420	226	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	96	126	415	224	125	1010	528	-	-	1489	-	-
Mov Cap-2 Maneuver	96	126	-	224	125	-	-	-	-	-	-	-
Stage 1	163	227	-	814	746	-	-	-	-	-	-	-
Stage 2	838	744	-	345	224	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	27.2	22.3	2.6	0.1
HCM LOS	D	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	EBLn3	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	528	-	-	96	-	415	289	1489	-	-
HCM Lane V/C Ratio	0.045	-	-	0.291	-	0.174	0.283	0.007	-	-
HCM Control Delay (s)	12.1	-	-	57.2	0	15.5	22.3	7.4	-	-
HCM Lane LOS	B	-	-	F	A	C	C	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	1.1	-	0.6	1.1	0	-	-

HCM 6th Signalized Intersection Summary
2: Devlin Rd & Airport Blvd

11/14/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	41	297	42	33	22	44	5	31	64	766	451	13
Future Volume (veh/h)	41	297	42	33	22	44	5	31	64	766	451	13
Initial Q (Qb), veh	5	6	0	0	0	0	0	0	0	30	9	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826
Adj Flow Rate, veh/h	43	309	24	34	23	29	5	32	35	873	365	13
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	5	5	5	5	5	5	5	5	5	5	5	5
Cap, veh/h	124	500	36	89	240	214	146	145	127	1176	581	18
Arrive On Green	0.06	0.15	0.15	0.05	0.14	0.14	0.09	0.09	0.09	0.33	0.33	0.33
Sat Flow, veh/h	1739	3263	252	1739	1735	1547	1739	1735	1521	3478	1752	62
Grp Volume(v), veh/h	43	163	170	34	23	29	5	32	35	873	0	378
Grp Sat Flow(s),veh/h/ln	1739	1735	1781	1739	1735	1547	1739	1735	1521	1739	0	1815
Q Serve(g_s), s	1.3	4.7	4.7	1.0	0.6	0.9	0.1	0.9	1.1	11.9	0.0	9.4
Cycle Q Clear(g_c), s	1.3	4.7	4.7	1.0	0.6	0.9	0.1	0.9	1.1	11.9	0.0	9.4
Prop In Lane	1.00		0.14	1.00		1.00	1.00		1.00	1.00		0.03
Lane Grp Cap(c), veh/h	124	264	271	89	240	214	146	145	127	1176	0	601
V/C Ratio(X)	0.35	0.62	0.63	0.38	0.10	0.14	0.03	0.22	0.27	0.74	0.00	0.63
Avail Cap(c_a), veh/h	659	986	1012	659	1183	1055	1186	1183	1037	2306	0	1203
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	24.7	21.6	21.6	26.4	21.6	21.7	24.3	24.7	24.8	20.3	0.0	17.0
Incr Delay (d2), s/veh	0.6	0.9	0.9	1.0	0.1	0.1	0.0	0.3	0.4	0.4	0.0	0.4
Initial Q Delay(d3),s/veh	18.0	2.4	2.4	0.0	0.0	0.0	0.0	0.0	0.0	18.2	0.0	4.3
%ile BackOfQ(50%),veh/ln	1.6	2.2	2.2	0.4	0.2	0.3	0.1	0.4	0.4	9.8	0.0	5.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	43.3	24.9	24.8	27.4	21.7	21.8	24.3	25.0	25.2	38.9	0.0	21.8
LnGrp LOS	D	C	C	C	C	C	C	C	C	D	A	C
Approach Vol, veh/h		376			86			72			1251	
Approach Delay, s/veh		27.0			24.0			25.0			33.7	
Approach LOS		C			C			C			C	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	7.5	13.0		22.6	6.9	13.6		9.7
Change Period (Y+Rc), s	* 4.2	5.8		5.4	* 4.2	5.8		5.1
Max Green Setting (Gmax), s	* 20	36.0		35.0	* 20	30.0		36.0
Max Q Clear Time (g_c+I1), s	3.3	2.9		13.9	3.0	6.7		3.1
Green Ext Time (p_c), s	0.0	0.1		3.2	0.0	1.0		0.2

Intersection Summary	
HCM 6th Ctrl Delay	31.5
HCM 6th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary
3: SR-29/SR-12/29 & Airport Blvd/SR-12

11/14/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	271	643	222	51	30	643	45	945	52	1171	1092	34
Future Volume (veh/h)	271	643	222	51	30	643	45	945	52	1171	1092	34
Initial Q (Qb), veh	28	25	0	4	0	0	0	0	0	6	8	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826
Adj Flow Rate, veh/h	279	663	0	53	31	0	46	974	24	1207	1126	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	5	5	5	5	5	5	5	5	5	5	5	5
Cap, veh/h	353	741		123	212		100	1019	316	1047	1787	
Arrive On Green	0.21	0.21	0.00	0.06	0.06	0.00	0.06	0.22	0.22	0.35	0.52	0.00
Sat Flow, veh/h	1739	3652	1547	1739	1826	1547	1739	4985	1547	3374	3469	1547
Grp Volume(v), veh/h	279	663	0	53	31	0	46	974	24	1207	1126	0
Grp Sat Flow(s),veh/h/ln	1739	1826	1547	1739	1826	1547	1739	1662	1547	1687	1735	1547
Q Serve(g_s), s	23.7	27.5	0.0	4.6	2.5	0.0	4.0	29.8	1.9	55.0	36.1	0.0
Cycle Q Clear(g_c), s	23.7	27.5	0.0	4.6	2.5	0.0	4.0	29.8	1.9	55.0	36.1	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	353	741		123	212		100	1019	316	1047	1787	
V/C Ratio(X)	0.79	0.89		0.43	0.15		0.46	0.96	0.08	1.15	0.63	
Avail Cap(c_a), veh/h	400	841		289	304		311	1116	346	1187	1800	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	70.7	70.7	0.0	71.1	67.2	0.0	77.4	66.8	54.6	61.1	28.2	0.0
Incr Delay (d2), s/veh	9.2	11.1	0.0	2.4	0.3	0.0	1.2	16.9	0.1	80.1	0.8	0.0
Initial Q Delay(d3),s/veh	191.1	73.7	0.0	13.5	0.0	0.0	0.0	0.0	0.0	20.6	0.4	0.0
%ile BackOfQ(50%),veh/ln	15.4	25.3	0.0	3.3	1.2	0.0	1.9	15.1	0.8	37.4	15.7	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	270.9	155.5	0.0	86.9	67.5	0.0	78.6	83.7	54.7	161.9	29.4	0.0
LnGrp LOS	F	F		F	E		E	F	D	F	C	
Approach Vol, veh/h		942			84			1044			2333	
Approach Delay, s/veh		189.7			79.8			82.8			98.0	
Approach LOS		F			E			F			F	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	14.2	87.6		16.5	61.5	40.4		38.0
Change Period (Y+Rc), s	4.7	6.5		6.5	6.5	* 6.5		5.8
Max Green Setting (Gmax), s	23	35.0		26.0	55.0	* 35		36.0
Max Q Clear Time (g_c+I1), s	6.0	38.1		6.6	57.0	31.8		29.5
Green Ext Time (p_c), s	0.0	0.0		0.2	0.0	2.1		2.7

Intersection Summary	
HCM 6th Ctrl Delay	113.7
HCM 6th LOS	F

Notes

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th TWSC
1: Devlin Rd & Gateway Rd W/Gateway Rd E

11/14/2023

Intersection	
Int Delay, s/veh	2.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	22	0	37	22	0	7	80	703	47	26	233	122
Future Vol, veh/h	22	0	37	22	0	7	80	703	47	26	233	122
Conflicting Peds, #/hr	1	0	7	6	0	0	7	0	6	0	0	1
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	160	-	370	-	-	-	175	-	-	0	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	5	5	5	5	5	5	5	5	5	5	5	5
Mvmt Flow	23	0	39	23	0	7	84	740	49	27	245	128

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	909	1333	201	1123	1373	402	380	0	0	795	0	0
Stage 1	370	370	-	939	939	-	-	-	-	-	-	-
Stage 2	539	963	-	184	434	-	-	-	-	-	-	-
Critical Hdwy	7.6	6.6	7	7.6	6.6	7	4.2	-	-	4.2	-	-
Critical Hdwy Stg 1	6.6	5.6	-	6.6	5.6	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.6	5.6	-	6.6	5.6	-	-	-	-	-	-	-
Follow-up Hdwy	3.55	4.05	3.35	3.55	4.05	3.35	2.25	-	-	2.25	-	-
Pot Cap-1 Maneuver	225	149	797	157	141	590	1154	-	-	803	-	-
Stage 1	614	611	-	278	334	-	-	-	-	-	-	-
Stage 2	487	325	-	791	572	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	203	132	786	135	125	586	1146	-	-	798	-	-
Mov Cap-2 Maneuver	203	132	-	135	125	-	-	-	-	-	-	-
Stage 1	565	586	-	256	308	-	-	-	-	-	-	-
Stage 2	445	299	-	722	549	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	15.5	31.5	0.8	0.7
HCM LOS	C	D		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	EBLn3	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1146	-	-	203	-	786	166	798	-	-
HCM Lane V/C Ratio	0.073	-	-	0.114	-	0.05	0.184	0.034	-	-
HCM Control Delay (s)	8.4	-	-	25	0	9.8	31.5	9.7	-	-
HCM Lane LOS	A	-	-	D	A	A	D	A	-	-
HCM 95th %tile Q(veh)	0.2	-	-	0.4	-	0.2	0.7	0.1	-	-

HCM 6th Signalized Intersection Summary
2: Devlin Rd & Airport Blvd

11/14/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	58	9	111	171	374	22	450	66	154	79	60
Future Volume (veh/h)	15	58	9	111	171	374	22	450	66	154	79	60
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826
Adj Flow Rate, veh/h	16	61	6	117	180	259	23	474	47	98	172	50
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	5	5	5	5	5	5	5	5	5	5	5	5
Cap, veh/h	48	475	46	189	399	355	378	693	68	236	370	104
Arrive On Green	0.03	0.15	0.15	0.11	0.23	0.23	0.22	0.22	0.22	0.14	0.14	0.14
Sat Flow, veh/h	1739	3195	310	1739	1735	1543	1739	3188	315	1739	2731	768
Grp Volume(v), veh/h	16	33	34	117	180	259	23	257	264	98	113	109
Grp Sat Flow(s),veh/h/ln	1739	1735	1770	1739	1735	1543	1739	1735	1768	1739	1826	1673
Q Serve(g_s), s	0.5	0.9	0.9	3.4	4.7	8.2	0.6	7.2	7.2	2.7	3.0	3.2
Cycle Q Clear(g_c), s	0.5	0.9	0.9	3.4	4.7	8.2	0.6	7.2	7.2	2.7	3.0	3.2
Prop In Lane	1.00		0.17	1.00		1.00	1.00		0.18	1.00		0.46
Lane Grp Cap(c), veh/h	48	258	263	189	399	355	378	377	385	236	247	227
V/C Ratio(X)	0.33	0.13	0.13	0.62	0.45	0.73	0.06	0.68	0.69	0.42	0.46	0.48
Avail Cap(c_a), veh/h	661	988	1009	661	1186	1055	1189	1186	1209	1156	1214	1112
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	25.1	19.4	19.5	22.4	17.4	18.8	16.3	18.9	18.9	20.8	21.0	21.0
Incr Delay (d2), s/veh	1.5	0.1	0.1	1.2	0.3	1.1	0.0	0.8	0.8	0.4	0.5	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.3	0.3	1.3	1.6	2.5	0.2	2.5	2.6	1.0	1.2	1.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	26.6	19.5	19.5	23.6	17.7	19.9	16.4	19.7	19.8	21.3	21.5	21.6
LnGrp LOS	C	B	B	C	B	B	B	B	B	C	C	C
Approach Vol, veh/h		83			556			544			320	
Approach Delay, s/veh		20.9			20.0			19.6			21.5	
Approach LOS		C			B			B			C	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	5.7	17.9		12.5	9.9	13.6		16.6
Change Period (Y+Rc), s	* 4.2	5.8		5.4	* 4.2	5.8		5.1
Max Green Setting (Gmax), s	* 20	36.0		35.0	* 20	30.0		36.0
Max Q Clear Time (g_c+I1), s	2.5	10.2		5.2	5.4	2.9		9.2
Green Ext Time (p_c), s	0.0	1.6		0.9	0.1	0.2		1.9

Intersection Summary	
HCM 6th Ctrl Delay	20.2
HCM 6th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary
3: SR-29/SR-12/29 & Airport Blvd/SR-12

11/14/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	122	94	73	51	328	1156	208	1388	45	1227	1069	136
Future Volume (veh/h)	122	94	73	51	328	1156	208	1388	45	1227	1069	136
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826
Adj Flow Rate, veh/h	128	99	0	54	345	0	219	1461	24	1292	1125	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	5	5	5	5	5	5	5	5	5	5	5	5
Cap, veh/h	293	154		293	308		239	1454	451	984	1586	
Arrive On Green	0.08	0.08	0.00	0.17	0.17	0.00	0.14	0.29	0.29	0.29	0.46	0.00
Sat Flow, veh/h	3478	1826	1547	1739	1826	1547	1739	4985	1547	3374	3469	1547
Grp Volume(v), veh/h	128	99	0	54	345	0	219	1461	24	1292	1125	0
Grp Sat Flow(s),veh/h/ln	1739	1826	1547	1739	1826	1547	1739	1662	1547	1687	1735	1547
Q Serve(g_s), s	5.4	8.1	0.0	4.1	26.0	0.0	19.2	45.0	1.7	45.0	40.2	0.0
Cycle Q Clear(g_c), s	5.4	8.1	0.0	4.1	26.0	0.0	19.2	45.0	1.7	45.0	40.2	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	293	154		293	308		239	1454	451	984	1586	
V/C Ratio(X)	0.44	0.64		0.18	1.12		0.91	1.00	0.05	1.31	0.71	
Avail Cap(c_a), veh/h	361	189		293	308		270	1454	451	984	1586	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	67.2	68.4	0.0	55.1	64.2	0.0	65.6	54.6	39.3	54.6	33.6	0.0
Incr Delay (d2), s/veh	1.0	5.2	0.0	0.3	88.1	0.0	29.5	24.8	0.1	148.2	1.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.4	4.0	0.0	1.8	19.2	0.0	10.2	21.4	0.7	38.5	16.4	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	68.2	73.6	0.0	55.3	152.3	0.0	95.2	79.5	39.4	202.9	35.3	0.0
LnGrp LOS	E	E		E	F		F	F	D	F	D	
Approach Vol, veh/h		227			399			1704			2417	
Approach Delay, s/veh		70.5			139.1			80.9			124.9	
Approach LOS		E			F			F			F	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	26.0	77.0		32.5	51.5	51.5		18.8
Change Period (Y+Rc), s	4.7	6.5		6.5	6.5	* 6.5		5.8
Max Green Setting (Gmax), s	24	45.0		26.0	45.0	* 45		16.0
Max Q Clear Time (g_c+I1), s	21.2	42.2		28.0	47.0	47.0		10.1
Green Ext Time (p_c), s	0.1	2.0		0.0	0.0	0.0		0.4

Intersection Summary	
HCM 6th Ctrl Delay	107.7
HCM 6th LOS	F

Notes

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th TWSC
1: Devlin Rd & Gateway Rd W/Gateway Rd E

11/14/2023

Intersection	
Int Delay, s/veh	4.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	32	0	65	63	1	28	21	89	7	12	1417	23
Future Vol, veh/h	32	0	65	63	1	28	21	89	7	12	1417	23
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	160	-	370	-	-	-	175	-	-	0	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	5	5	5	5	5	5	5	5	5	5	5	5
Mvmt Flow	34	0	68	66	1	29	22	94	7	13	1492	24

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1622	1675	758	914	1684	51	1516	0	0	101	0	0
Stage 1	1530	1530	-	142	142	-	-	-	-	-	-	-
Stage 2	92	145	-	772	1542	-	-	-	-	-	-	-
Critical Hdwy	7.6	6.6	7	7.6	6.6	7	4.2	-	-	4.2	-	-
Critical Hdwy Stg 1	6.6	5.6	-	6.6	5.6	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.6	5.6	-	6.6	5.6	-	-	-	-	-	-	-
Follow-up Hdwy	3.55	4.05	3.35	3.55	4.05	3.35	2.25	-	-	2.25	-	-
Pot Cap-1 Maneuver	66	92	343	223	90	996	422	-	-	1468	-	-
Stage 1	119	172	-	838	771	-	-	-	-	-	-	-
Stage 2	896	769	-	352	170	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	61	86	343	170	85	996	422	-	-	1468	-	-
Mov Cap-2 Maneuver	61	86	-	170	85	-	-	-	-	-	-	-
Stage 1	113	170	-	794	731	-	-	-	-	-	-	-
Stage 2	823	729	-	279	168	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	52	32.8	2.5	0.1
HCM LOS	F	D		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	EBLn3	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	422	-	-	61	-	343	224	1468	-	-
HCM Lane V/C Ratio	0.052	-	-	0.552	-	0.199	0.432	0.009	-	-
HCM Control Delay (s)	14	-	-	120.8	0	18.1	32.8	7.5	-	-
HCM Lane LOS	B	-	-	F	A	C	D	A	-	-
HCM 95th %tile Q(veh)	0.2	-	-	2.2	-	0.7	2	0	-	-

HCM 6th Signalized Intersection Summary
2: Devlin Rd & Airport Blvd

11/14/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	50	363	51	40	27	48	6	38	78	918	551	16
Future Volume (veh/h)	50	363	51	40	27	48	6	38	78	918	551	16
Initial Q (Qb), veh	5	6	0	0	0	0	0	0	0	30	9	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826
Adj Flow Rate, veh/h	53	382	34	42	28	34	6	40	49	1068	437	16
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	5	5	5	5	5	5	5	5	5	5	5	5
Cap, veh/h	132	549	46	97	268	239	147	147	129	1270	649	21
Arrive On Green	0.07	0.16	0.16	0.06	0.15	0.15	0.09	0.09	0.09	0.37	0.37	0.37
Sat Flow, veh/h	1739	3224	285	1739	1735	1547	1739	1735	1519	3478	1750	64
Grp Volume(v), veh/h	53	205	211	42	28	34	6	40	49	1068	0	453
Grp Sat Flow(s),veh/h/ln	1739	1735	1775	1739	1735	1547	1739	1735	1519	1739	0	1814
Q Serve(g_s), s	1.9	7.2	7.3	1.5	0.9	1.2	0.2	1.4	2.0	17.9	0.0	13.5
Cycle Q Clear(g_c), s	1.9	7.2	7.3	1.5	0.9	1.2	0.2	1.4	2.0	17.9	0.0	13.5
Prop In Lane	1.00		0.16	1.00		1.00	1.00		1.00	1.00		0.04
Lane Grp Cap(c), veh/h	132	294	301	97	268	239	147	147	129	1270	0	670
V/C Ratio(X)	0.40	0.70	0.70	0.43	0.10	0.14	0.04	0.27	0.38	0.84	0.00	0.68
Avail Cap(c_a), veh/h	541	810	828	541	972	867	974	972	851	1894	0	988
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	29.5	25.7	25.8	32.2	25.6	25.7	29.7	30.3	30.6	26.2	0.0	19.4
Incr Delay (d2), s/veh	0.7	1.1	1.1	1.1	0.1	0.1	0.0	0.4	0.7	1.5	0.0	0.4
Initial Q Delay(d3),s/veh	17.3	2.5	2.4	0.0	0.0	0.0	0.0	0.0	0.0	25.3	0.0	4.0
%ile BackOfQ(50%),veh/ln	1.9	3.3	3.3	0.7	0.4	0.5	0.1	0.6	0.8	15.5	0.0	7.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	47.6	29.3	29.3	33.3	25.6	25.8	29.7	30.6	31.2	52.9	0.0	23.8
LnGrp LOS	D	C	C	C	C	C	C	C	C	D	A	C
Approach Vol, veh/h		469			104			95			1521	
Approach Delay, s/veh		31.4			28.8			30.9			44.3	
Approach LOS		C			C			C			D	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	8.5	15.8		29.2	7.9	16.3		10.8
Change Period (Y+Rc), s	* 4.2	5.8		5.4	* 4.2	5.8		5.1
Max Green Setting (Gmax), s	* 20	36.0		35.0	* 20	30.0		36.0
Max Q Clear Time (g_c+I1), s	3.9	3.2		19.9	3.5	9.3		4.0
Green Ext Time (p_c), s	0.0	0.2		3.8	0.0	1.3		0.3

Intersection Summary	
HCM 6th Ctrl Delay	40.2
HCM 6th LOS	D

Notes

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary
3: SR-29/SR-12/29 & Airport Blvd/SR-12

11/14/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	322	785	263	62	37	785	52	1154	63	1430	1333	39
Future Volume (veh/h)	322	785	263	62	37	785	52	1154	63	1430	1333	39
Initial Q (Qb), veh	28	25	0	4	0	0	0	0	0	6	8	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826
Adj Flow Rate, veh/h	339	826	0	65	39	0	55	1215	35	1505	1403	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	5	5	5	5	5	5	5	5	5	5	5	5
Cap, veh/h	353	741		120	223		103	984	314	1047	1731	
Arrive On Green	0.22	0.22	0.00	0.06	0.06	0.00	0.06	0.22	0.22	0.34	0.51	0.00
Sat Flow, veh/h	1739	3652	1547	1739	1826	1547	1739	4985	1547	3374	3469	1547
Grp Volume(v), veh/h	339	826	0	65	39	0	55	1215	35	1505	1403	0
Grp Sat Flow(s),veh/h/ln	1739	1826	1547	1739	1826	1547	1739	1662	1547	1687	1735	1547
Q Serve(g_s), s	30.3	36.0	0.0	5.9	3.3	0.0	4.9	35.0	2.9	55.0	54.0	0.0
Cycle Q Clear(g_c), s	30.3	36.0	0.0	5.9	3.3	0.0	4.9	35.0	2.9	55.0	54.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	353	741		120	223		103	984	314	1047	1731	
V/C Ratio(X)	0.96	1.11		0.54	0.18		0.53	1.23	0.11	1.44	0.81	
Avail Cap(c_a), veh/h	388	815		280	294		302	1082	336	1150	1758	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	70.7	70.7	0.0	73.9	67.9	0.0	78.9	71.2	56.1	61.1	35.4	0.0
Incr Delay (d2), s/veh	34.0	68.9	0.0	3.7	0.4	0.0	1.6	114.5	0.2	202.6	3.1	0.0
Initial Q Delay(d3),s/veh	267.5	121.4	0.0	17.4	0.0	0.0	0.0	0.0	0.0	20.6	0.8	0.0
%ile BackOfQ(50%),veh/ln	45.4	36.2	0.0	4.0	1.5	0.0	2.4	24.9	1.2	55.2	24.2	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	372.2	261.0	0.0	95.0	68.2	0.0	80.5	185.7	56.4	284.4	39.3	0.0
LnGrp LOS	F	F		F	E		F	F	E	F	D	
Approach Vol, veh/h		1165			104			1305			2908	
Approach Delay, s/veh		293.3			85.0			177.8			166.2	
Approach LOS		F			F			F			F	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	14.8	88.2		16.5	61.5	41.5		41.8
Change Period (Y+Rc), s	4.7	6.5		6.5	6.5	* 6.5		5.8
Max Green Setting (Gmax), s	23	35.0		26.0	55.0	* 35		36.0
Max Q Clear Time (g_c+I1), s	10.3	56.0		7.9	57.0	37.0		38.0
Green Ext Time (p_c), s	0.0	0.0		0.2	0.0	0.0		0.0

Intersection Summary	
HCM 6th Ctrl Delay	194.4
HCM 6th LOS	F

Notes

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th TWSC
1: Devlin Rd & Gateway Rd W/Gateway Rd E

11/14/2023

Intersection	
Int Delay, s/veh	2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	22	0	13	22	0	7	81	703	47	26	233	122
Future Vol, veh/h	22	0	13	22	0	7	81	703	47	26	233	122
Conflicting Peds, #/hr	1	0	7	6	0	0	7	0	6	0	0	1
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	160	-	370	-	-	-	175	-	-	0	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	5	5	5	5	5	5	5	5	5	5	5	5
Mvmt Flow	23	0	14	23	0	7	85	740	49	27	245	128

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	911	1335	201	1125	1375	402	380	0	0	795	0	0
Stage 1	370	370	-	941	941	-	-	-	-	-	-	-
Stage 2	541	965	-	184	434	-	-	-	-	-	-	-
Critical Hdwy	7.6	6.6	7	7.6	6.6	7	4.2	-	-	4.2	-	-
Critical Hdwy Stg 1	6.6	5.6	-	6.6	5.6	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.6	5.6	-	6.6	5.6	-	-	-	-	-	-	-
Follow-up Hdwy	3.55	4.05	3.35	3.55	4.05	3.35	2.25	-	-	2.25	-	-
Pot Cap-1 Maneuver	225	149	797	156	140	590	1154	-	-	803	-	-
Stage 1	614	611	-	277	333	-	-	-	-	-	-	-
Stage 2	485	325	-	791	572	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	203	132	786	139	124	586	1146	-	-	798	-	-
Mov Cap-2 Maneuver	203	132	-	139	124	-	-	-	-	-	-	-
Stage 1	565	586	-	255	306	-	-	-	-	-	-	-
Stage 2	443	299	-	746	549	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	19.3	30.8	0.8	0.7
HCM LOS	C	D		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	EBLn3	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1146	-	-	203	-	786	170	798	-	-
HCM Lane V/C Ratio	0.074	-	-	0.114	-	0.017	0.18	0.034	-	-
HCM Control Delay (s)	8.4	-	-	25	0	9.7	30.8	9.7	-	-
HCM Lane LOS	A	-	-	D	A	A	D	A	-	-
HCM 95th %tile Q(veh)	0.2	-	-	0.4	-	0.1	0.6	0.1	-	-

HCM 6th Signalized Intersection Summary
2: Devlin Rd & Airport Blvd

11/14/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	58	9	111	171	375	22	450	66	130	79	60
Future Volume (veh/h)	15	58	9	111	171	375	22	450	66	130	79	60
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826
Adj Flow Rate, veh/h	16	61	6	117	180	260	23	474	47	90	149	50
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	5	5	5	5	5	5	5	5	5	5	5	5
Cap, veh/h	48	477	46	189	400	356	378	693	68	234	355	114
Arrive On Green	0.03	0.15	0.15	0.11	0.23	0.23	0.22	0.22	0.22	0.13	0.13	0.13
Sat Flow, veh/h	1739	3195	310	1739	1735	1543	1739	3188	315	1739	2635	848
Grp Volume(v), veh/h	16	33	34	117	180	260	23	257	264	90	101	98
Grp Sat Flow(s),veh/h/ln	1739	1735	1770	1739	1735	1543	1739	1735	1768	1739	1826	1657
Q Serve(g_s), s	0.5	0.9	0.9	3.4	4.7	8.2	0.6	7.2	7.2	2.5	2.7	2.9
Cycle Q Clear(g_c), s	0.5	0.9	0.9	3.4	4.7	8.2	0.6	7.2	7.2	2.5	2.7	2.9
Prop In Lane	1.00		0.17	1.00		1.00	1.00		0.18	1.00		0.51
Lane Grp Cap(c), veh/h	48	259	264	189	400	356	378	377	385	234	246	223
V/C Ratio(X)	0.33	0.13	0.13	0.62	0.45	0.73	0.06	0.68	0.69	0.38	0.41	0.44
Avail Cap(c_a), veh/h	661	988	1009	661	1186	1055	1189	1186	1209	1156	1214	1102
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	25.1	19.4	19.4	22.4	17.4	18.7	16.3	18.9	18.9	20.8	20.9	20.9
Incr Delay (d2), s/veh	1.5	0.1	0.1	1.2	0.3	1.1	0.0	0.8	0.8	0.4	0.4	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.3	0.3	1.3	1.6	2.5	0.2	2.5	2.6	0.9	1.0	1.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	26.6	19.5	19.5	23.6	17.7	19.8	16.4	19.7	19.8	21.2	21.3	21.4
LnGrp LOS	C	B	B	C	B	B	B	B	B	C	C	C
Approach Vol, veh/h		83			557			544			289	
Approach Delay, s/veh		20.9			19.9			19.6			21.3	
Approach LOS		C			B			B			C	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	5.7	17.9		12.5	9.9	13.7		16.6
Change Period (Y+Rc), s	* 4.2	5.8		5.4	* 4.2	5.8		5.1
Max Green Setting (Gmax), s	* 20	36.0		35.0	* 20	30.0		36.0
Max Q Clear Time (g_c+I1), s	2.5	10.2		4.9	5.4	2.9		9.2
Green Ext Time (p_c), s	0.0	1.6		0.8	0.1	0.2		1.9

Intersection Summary	
HCM 6th Ctrl Delay	20.1
HCM 6th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary
3: SR-29/SR-12/29 & Airport Blvd/SR-12

11/14/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	110	94	61	51	328	1156	208	1388	45	1227	1069	137
Future Volume (veh/h)	110	94	61	51	328	1156	208	1388	45	1227	1069	137
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826
Adj Flow Rate, veh/h	120	94	0	54	345	0	219	1461	24	1292	1125	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	5	5	5	5	5	5	5	5	5	5	5	5
Cap, veh/h	293	154		293	308		239	1454	451	984	1586	
Arrive On Green	0.08	0.08	0.00	0.17	0.17	0.00	0.14	0.29	0.29	0.29	0.46	0.00
Sat Flow, veh/h	3478	1826	1547	1739	1826	1547	1739	4985	1547	3374	3469	1547
Grp Volume(v), veh/h	120	94	0	54	345	0	219	1461	24	1292	1125	0
Grp Sat Flow(s),veh/h/ln	1739	1826	1547	1739	1826	1547	1739	1662	1547	1687	1735	1547
Q Serve(g_s), s	5.0	7.7	0.0	4.1	26.0	0.0	19.2	45.0	1.7	45.0	40.2	0.0
Cycle Q Clear(g_c), s	5.0	7.7	0.0	4.1	26.0	0.0	19.2	45.0	1.7	45.0	40.2	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	293	154		293	308		239	1454	451	984	1586	
V/C Ratio(X)	0.41	0.61		0.18	1.12		0.91	1.00	0.05	1.31	0.71	
Avail Cap(c_a), veh/h	361	189		293	308		270	1454	451	984	1586	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	67.0	68.2	0.0	55.1	64.2	0.0	65.6	54.6	39.3	54.6	33.6	0.0
Incr Delay (d2), s/veh	0.9	3.9	0.0	0.3	88.1	0.0	29.5	24.8	0.1	148.2	1.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.3	3.7	0.0	1.8	19.2	0.0	10.2	21.4	0.7	38.5	16.4	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	67.9	72.1	0.0	55.3	152.3	0.0	95.2	79.5	39.4	202.9	35.3	0.0
LnGrp LOS	E	E		E	F		F	F	D	F	D	
Approach Vol, veh/h		214			399			1704			2417	
Approach Delay, s/veh		69.8			139.1			80.9			124.9	
Approach LOS		E			F			F			F	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	26.0	77.0		32.5	51.5	51.5		18.8
Change Period (Y+Rc), s	4.7	6.5		6.5	6.5	* 6.5		5.8
Max Green Setting (Gmax), s	24	45.0		26.0	45.0	* 45		16.0
Max Q Clear Time (g_c+I1), s	21.2	42.2		28.0	47.0	47.0		9.7
Green Ext Time (p_c), s	0.1	2.0		0.0	0.0	0.0		0.4

Intersection Summary	
HCM 6th Ctrl Delay	107.8
HCM 6th LOS	F

Notes

User approved volume balancing among the lanes for turning movement.
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.
Unsignalized Delay for [EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th TWSC
1: Devlin Rd & Gateway Rd W/Gateway Rd E

11/14/2023

Intersection	
Int Delay, s/veh	4.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	32	0	48	63	1	28	16	89	7	12	1417	23
Future Vol, veh/h	32	0	48	63	1	28	16	89	7	12	1417	23
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	160	-	370	-	-	-	175	-	-	0	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	5	5	5	5	5	5	5	5	5	5	5	5
Mvmt Flow	34	0	51	66	1	29	17	94	7	13	1492	24

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1612	1665	758	904	1674	51	1516	0	0	101	0	0
Stage 1	1530	1530	-	132	132	-	-	-	-	-	-	-
Stage 2	82	135	-	772	1542	-	-	-	-	-	-	-
Critical Hdwy	7.6	6.6	7	7.6	6.6	7	4.2	-	-	4.2	-	-
Critical Hdwy Stg 1	6.6	5.6	-	6.6	5.6	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.6	5.6	-	6.6	5.6	-	-	-	-	-	-	-
Follow-up Hdwy	3.55	4.05	3.35	3.55	4.05	3.35	2.25	-	-	2.25	-	-
Pot Cap-1 Maneuver	67	93	343	227	92	996	422	-	-	1468	-	-
Stage 1	119	172	-	849	779	-	-	-	-	-	-	-
Stage 2	908	777	-	352	170	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	62	88	343	186	87	996	422	-	-	1468	-	-
Mov Cap-2 Maneuver	62	88	-	186	87	-	-	-	-	-	-	-
Stage 1	114	170	-	815	748	-	-	-	-	-	-	-
Stage 2	844	746	-	297	168	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	57.4	29.3	2	0.1
HCM LOS	F	D		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	EBLn3	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	422	-	-	62	-	343	243	1468	-	-
HCM Lane V/C Ratio	0.04	-	-	0.543	-	0.147	0.399	0.009	-	-
HCM Control Delay (s)	13.9	-	-	117.6	0	17.3	29.3	7.5	-	-
HCM Lane LOS	B	-	-	F	A	C	D	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	2.2	-	0.5	1.8	0	-	-

HCM 6th Signalized Intersection Summary
2: Devlin Rd & Airport Blvd

11/14/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	50	363	51	40	27	43	6	38	78	901	551	16
Future Volume (veh/h)	50	363	51	40	27	43	6	38	78	901	551	16
Initial Q (Qb), veh	5	6	0	0	0	0	0	0	0	30	9	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826
Adj Flow Rate, veh/h	53	382	34	42	28	28	6	40	49	1058	425	16
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	5	5	5	5	5	5	5	5	5	5	5	5
Cap, veh/h	132	550	46	97	272	236	148	148	129	1267	645	21
Arrive On Green	0.07	0.16	0.16	0.06	0.16	0.16	0.09	0.09	0.09	0.37	0.37	0.37
Sat Flow, veh/h	1739	3224	285	1739	1759	1527	1739	1735	1519	3478	1748	66
Grp Volume(v), veh/h	53	205	211	42	28	28	6	40	49	1058	0	441
Grp Sat Flow(s),veh/h/ln	1739	1735	1775	1739	1735	1551	1739	1735	1519	1739	0	1814
Q Serve(g_s), s	1.9	7.1	7.2	1.5	0.9	1.0	0.2	1.4	1.9	17.7	0.0	13.0
Cycle Q Clear(g_c), s	1.9	7.1	7.2	1.5	0.9	1.0	0.2	1.4	1.9	17.7	0.0	13.0
Prop In Lane	1.00		0.16	1.00		0.98	1.00		1.00	1.00		0.04
Lane Grp Cap(c), veh/h	132	294	301	97	268	240	148	148	129	1267	0	666
V/C Ratio(X)	0.40	0.70	0.70	0.43	0.10	0.12	0.04	0.27	0.38	0.84	0.00	0.66
Avail Cap(c_a), veh/h	545	815	834	545	978	874	980	978	857	1906	0	994
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	29.3	25.6	25.6	31.9	25.3	25.4	29.4	30.0	30.3	25.8	0.0	19.2
Incr Delay (d2), s/veh	0.7	1.1	1.1	1.1	0.1	0.1	0.0	0.4	0.7	1.3	0.0	0.4
Initial Q Delay(d3),s/veh	17.2	2.5	2.4	0.0	0.0	0.0	0.0	0.0	0.0	24.5	0.0	3.9
%ile BackOfQ(50%),veh/ln	1.8	3.2	3.3	0.7	0.4	0.4	0.1	0.6	0.8	15.1	0.0	7.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	47.3	29.1	29.1	33.0	25.4	25.5	29.4	30.3	30.9	51.6	0.0	23.5
LnGrp LOS	D	C	C	C	C	C	C	C	C	D	A	C
Approach Vol, veh/h		469			98			95			1499	
Approach Delay, s/veh		31.2			28.7			30.6			43.3	
Approach LOS		C			C			C			D	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	8.5	15.7		28.9	7.9	16.3		10.8
Change Period (Y+Rc), s	* 4.2	5.8		5.4	* 4.2	5.8		5.1
Max Green Setting (Gmax), s	* 20	36.0		35.0	* 20	30.0		36.0
Max Q Clear Time (g_c+I1), s	3.9	3.0		19.7	3.5	9.2		3.9
Green Ext Time (p_c), s	0.0	0.1		3.7	0.0	1.3		0.3

Intersection Summary	
HCM 6th Ctrl Delay	39.5
HCM 6th LOS	D

Notes

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary
3: SR-29/SR-12/29 & Airport Blvd/SR-12

11/14/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	314	785	254	62	37	785	50	1154	63	1430	1333	36
Future Volume (veh/h)	314	785	254	62	37	785	50	1154	63	1430	1333	36
Initial Q (Qb), veh	28	25	0	4	0	0	0	0	0	6	8	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826
Adj Flow Rate, veh/h	331	826	0	65	39	0	53	1215	35	1505	1403	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	5	5	5	5	5	5	5	5	5	5	5	5
Cap, veh/h	353	741		120	223		102	984	314	1047	1733	
Arrive On Green	0.22	0.22	0.00	0.06	0.06	0.00	0.06	0.22	0.22	0.34	0.51	0.00
Sat Flow, veh/h	1739	3652	1547	1739	1826	1547	1739	4985	1547	3374	3469	1547
Grp Volume(v), veh/h	331	826	0	65	39	0	53	1215	35	1505	1403	0
Grp Sat Flow(s),veh/h/ln	1739	1826	1547	1739	1826	1547	1739	1662	1547	1687	1735	1547
Q Serve(g_s), s	29.5	36.0	0.0	5.9	3.3	0.0	4.8	35.0	2.9	55.0	54.0	0.0
Cycle Q Clear(g_c), s	29.5	36.0	0.0	5.9	3.3	0.0	4.8	35.0	2.9	55.0	54.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	353	741		120	223		102	984	314	1047	1733	
V/C Ratio(X)	0.94	1.11		0.54	0.18		0.52	1.23	0.11	1.44	0.81	
Avail Cap(c_a), veh/h	388	815		280	294		302	1082	336	1150	1760	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	70.7	70.7	0.0	73.9	67.9	0.0	78.9	71.2	56.1	61.1	35.3	0.0
Incr Delay (d2), s/veh	29.0	68.9	0.0	3.7	0.4	0.0	1.5	114.5	0.2	202.6	3.1	0.0
Initial Q Delay(d3),s/veh	257.3	121.4	0.0	17.4	0.0	0.0	0.0	0.0	0.0	20.6	0.8	0.0
%ile BackOfQ(50%),veh/ln	48.9	36.2	0.0	4.0	1.5	0.0	2.3	24.9	1.2	55.2	24.2	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	356.9	261.0	0.0	95.0	68.2	0.0	80.4	185.7	56.4	284.4	39.2	0.0
LnGrp LOS	F	F		F	E		F	F	E	F	D	
Approach Vol, veh/h		1157			104			1303			2908	
Approach Delay, s/veh		288.4			85.0			177.9			166.1	
Approach LOS		F			F			F			F	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	14.7	88.3		16.5	61.5	41.5		41.8
Change Period (Y+Rc), s	4.7	6.5		6.5	6.5	* 6.5		5.8
Max Green Setting (Gmax), s	23	35.0		26.0	55.0	* 35		36.0
Max Q Clear Time (g_c+I1), s	6.8	56.0		7.9	57.0	37.0		38.0
Green Ext Time (p_c), s	0.0	0.0		0.2	0.0	0.0		0.0

Intersection Summary	
HCM 6th Ctrl Delay	193.2
HCM 6th LOS	F

Notes

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th TWSC
1: Devlin Rd & Gateway Rd W/Gateway Rd E

11/14/2023

Intersection	
Int Delay, s/veh	2.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	22	0	39	22	0	7	89	703	47	26	233	122
Future Vol, veh/h	22	0	39	22	0	7	89	703	47	26	233	122
Conflicting Peds, #/hr	1	0	7	6	0	0	7	0	6	0	0	1
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	160	-	370	-	-	-	175	-	-	0	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	5	5	5	5	5	5	5	5	5	5	5	5
Mvmt Flow	23	0	41	23	0	7	94	740	49	27	245	128

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	929	1353	201	1143	1393	402	380	0	0	795	0	0
Stage 1	370	370	-	959	959	-	-	-	-	-	-	-
Stage 2	559	983	-	184	434	-	-	-	-	-	-	-
Critical Hdwy	7.6	6.6	7	7.6	6.6	7	4.2	-	-	4.2	-	-
Critical Hdwy Stg 1	6.6	5.6	-	6.6	5.6	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.6	5.6	-	6.6	5.6	-	-	-	-	-	-	-
Follow-up Hdwy	3.55	4.05	3.35	3.55	4.05	3.35	2.25	-	-	2.25	-	-
Pot Cap-1 Maneuver	218	145	797	151	137	590	1154	-	-	803	-	-
Stage 1	614	611	-	270	327	-	-	-	-	-	-	-
Stage 2	473	318	-	791	572	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	195	127	786	129	120	586	1146	-	-	798	-	-
Mov Cap-2 Maneuver	195	127	-	129	120	-	-	-	-	-	-	-
Stage 1	560	586	-	247	298	-	-	-	-	-	-	-
Stage 2	428	290	-	719	549	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	15.6	32.9	0.9	0.7
HCM LOS	C	D		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	EBLn3	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1146	-	-	195	-	786	159	798	-	-
HCM Lane V/C Ratio	0.082	-	-	0.119	-	0.052	0.192	0.034	-	-
HCM Control Delay (s)	8.4	-	-	25.9	0	9.8	32.9	9.7	-	-
HCM Lane LOS	A	-	-	D	A	A	D	A	-	-
HCM 95th %tile Q(veh)	0.3	-	-	0.4	-	0.2	0.7	0.1	-	-

HCM 6th Signalized Intersection Summary
2: Devlin Rd & Airport Blvd

11/14/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	58	9	111	171	383	22	450	66	156	79	60
Future Volume (veh/h)	15	58	9	111	171	383	22	450	66	156	79	60
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826
Adj Flow Rate, veh/h	16	61	6	117	180	268	23	474	47	99	174	50
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	5	5	5	5	5	5	5	5	5	5	5	5
Cap, veh/h	48	494	48	188	408	363	377	691	68	234	368	102
Arrive On Green	0.03	0.15	0.15	0.11	0.24	0.24	0.22	0.22	0.22	0.13	0.13	0.13
Sat Flow, veh/h	1739	3195	310	1739	1735	1543	1739	3188	315	1739	2739	761
Grp Volume(v), veh/h	16	33	34	117	180	268	23	257	264	99	114	110
Grp Sat Flow(s),veh/h/ln	1739	1735	1770	1739	1735	1543	1739	1735	1768	1739	1826	1674
Q Serve(g_s), s	0.5	0.9	0.9	3.4	4.7	8.5	0.6	7.2	7.3	2.8	3.1	3.2
Cycle Q Clear(g_c), s	0.5	0.9	0.9	3.4	4.7	8.5	0.6	7.2	7.3	2.8	3.1	3.2
Prop In Lane	1.00		0.17	1.00		1.00	1.00		0.18	1.00		0.45
Lane Grp Cap(c), veh/h	48	268	274	188	408	363	377	376	383	234	245	225
V/C Ratio(X)	0.33	0.12	0.13	0.62	0.44	0.74	0.06	0.68	0.69	0.42	0.46	0.49
Avail Cap(c_a), veh/h	654	979	999	654	1175	1045	1178	1175	1198	1145	1202	1103
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	25.4	19.4	19.4	22.7	17.3	18.8	16.5	19.1	19.2	21.1	21.2	21.3
Incr Delay (d2), s/veh	1.5	0.1	0.1	1.2	0.3	1.1	0.0	0.8	0.8	0.5	0.5	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.3	0.3	1.3	1.6	2.6	0.2	2.6	2.6	1.0	1.2	1.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	26.8	19.4	19.4	23.9	17.6	19.9	16.5	20.0	20.0	21.6	21.7	21.9
LnGrp LOS	C	B	B	C	B	B	B	B	B	C	C	C
Approach Vol, veh/h		83			565			544			323	
Approach Delay, s/veh		20.9			20.0			19.8			21.8	
Approach LOS		C			C			B			C	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	5.7	18.3		12.5	10.0	14.0		16.6
Change Period (Y+Rc), s	* 4.2	5.8		5.4	* 4.2	5.8		5.1
Max Green Setting (Gmax), s	* 20	36.0		35.0	* 20	30.0		36.0
Max Q Clear Time (g_c+I1), s	2.5	10.5		5.2	5.4	2.9		9.3
Green Ext Time (p_c), s	0.0	1.6		0.9	0.1	0.2		1.9

Intersection Summary	
HCM 6th Ctrl Delay	20.4
HCM 6th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary
3: SR-29/SR-12/29 & Airport Blvd/SR-12

11/14/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	123	94	74	51	328	1156	212	1388	45	1227	1069	141
Future Volume (veh/h)	123	94	74	51	328	1156	212	1388	45	1227	1069	141
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826
Adj Flow Rate, veh/h	129	99	0	54	345	0	223	1461	24	1292	1125	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	5	5	5	5	5	5	5	5	5	5	5	5
Cap, veh/h	293	154		293	308		243	1454	451	984	1578	
Arrive On Green	0.08	0.08	0.00	0.17	0.17	0.00	0.14	0.29	0.29	0.29	0.45	0.00
Sat Flow, veh/h	3478	1826	1547	1739	1826	1547	1739	4985	1547	3374	3469	1547
Grp Volume(v), veh/h	129	99	0	54	345	0	223	1461	24	1292	1125	0
Grp Sat Flow(s),veh/h/ln	1739	1826	1547	1739	1826	1547	1739	1662	1547	1687	1735	1547
Q Serve(g_s), s	5.4	8.1	0.0	4.1	26.0	0.0	19.5	45.0	1.7	45.0	40.4	0.0
Cycle Q Clear(g_c), s	5.4	8.1	0.0	4.1	26.0	0.0	19.5	45.0	1.7	45.0	40.4	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	293	154		293	308		243	1454	451	984	1578	
V/C Ratio(X)	0.44	0.64		0.18	1.12		0.92	1.00	0.05	1.31	0.71	
Avail Cap(c_a), veh/h	361	189		293	308		270	1454	451	984	1578	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	67.2	68.4	0.0	55.1	64.2	0.0	65.5	54.6	39.3	54.6	33.9	0.0
Incr Delay (d2), s/veh	1.0	5.2	0.0	0.3	88.1	0.0	30.4	24.8	0.1	148.2	1.7	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.4	4.0	0.0	1.8	19.2	0.0	10.5	21.4	0.7	38.5	16.5	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	68.2	73.6	0.0	55.3	152.3	0.0	95.8	79.5	39.4	202.9	35.6	0.0
LnGrp LOS	E	E		E	F		F	F	D	F	D	
Approach Vol, veh/h		228			399			1708			2417	
Approach Delay, s/veh		70.5			139.1			81.0			125.0	
Approach LOS		E			F			F			F	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	26.3	76.7		32.5	51.5	51.5		18.8
Change Period (Y+Rc), s	4.7	6.5		6.5	6.5	* 6.5		5.8
Max Green Setting (Gmax), s	24	45.0		26.0	45.0	* 45		16.0
Max Q Clear Time (g_c+I1), s	21.5	42.4		28.0	47.0	47.0		10.1
Green Ext Time (p_c), s	0.1	1.9		0.0	0.0	0.0		0.4

Intersection Summary	
HCM 6th Ctrl Delay	107.8
HCM 6th LOS	F

Notes

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th TWSC
1: Devlin Rd & Gateway Rd W/Gateway Rd E

11/14/2023

Intersection	
Int Delay, s/veh	5.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	32	0	74	63	1	28	24	89	7	12	1417	23
Future Vol, veh/h	32	0	74	63	1	28	24	89	7	12	1417	23
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	160	-	370	-	-	-	175	-	-	0	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	5	5	5	5	5	5	5	5	5	5	5	5
Mvmt Flow	34	0	78	66	1	29	25	94	7	13	1492	24

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1628	1681	758	920	1690	51	1516	0	0	101	0	0
Stage 1	1530	1530	-	148	148	-	-	-	-	-	-	-
Stage 2	98	151	-	772	1542	-	-	-	-	-	-	-
Critical Hdwy	7.6	6.6	7	7.6	6.6	7	4.2	-	-	4.2	-	-
Critical Hdwy Stg 1	6.6	5.6	-	6.6	5.6	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.6	5.6	-	6.6	5.6	-	-	-	-	-	-	-
Follow-up Hdwy	3.55	4.05	3.35	3.55	4.05	3.35	2.25	-	-	2.25	-	-
Pot Cap-1 Maneuver	66	91	343	221	90	996	422	-	-	1468	-	-
Stage 1	119	172	-	831	767	-	-	-	-	-	-	-
Stage 2	889	764	-	352	170	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	60	85	343	162	84	996	422	-	-	1468	-	-
Mov Cap-2 Maneuver	60	85	-	162	84	-	-	-	-	-	-	-
Stage 1	112	170	-	782	722	-	-	-	-	-	-	-
Stage 2	810	719	-	270	168	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	50.4	34.9	2.8	0.1
HCM LOS	F	D		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	EBLn3	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	422	-	-	60	-	343	214	1468	-	-
HCM Lane V/C Ratio	0.06	-	-	0.561	-	0.227	0.453	0.009	-	-
HCM Control Delay (s)	14.1	-	-	124.1	0	18.6	34.9	7.5	-	-
HCM Lane LOS	B	-	-	F	A	C	D	A	-	-
HCM 95th %tile Q(veh)	0.2	-	-	2.3	-	0.9	2.2	0	-	-

HCM 6th Signalized Intersection Summary
2: Devlin Rd & Airport Blvd

11/14/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	50	363	51	40	27	51	6	38	78	927	551	16
Future Volume (veh/h)	50	363	51	40	27	51	6	38	78	927	551	16
Initial Q (Qb), veh	5	6	0	0	0	0	0	0	0	30	9	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826
Adj Flow Rate, veh/h	53	382	34	42	28	37	6	40	49	1073	444	16
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	5	5	5	5	5	5	5	5	5	5	5	5
Cap, veh/h	132	549	46	97	268	239	147	147	128	1271	652	20
Arrive On Green	0.07	0.16	0.16	0.06	0.15	0.15	0.09	0.09	0.09	0.37	0.37	0.37
Sat Flow, veh/h	1739	3224	285	1739	1735	1547	1739	1735	1519	3478	1751	63
Grp Volume(v), veh/h	53	205	211	42	28	37	6	40	49	1073	0	460
Grp Sat Flow(s),veh/h/ln	1739	1735	1775	1739	1735	1547	1739	1735	1519	1739	0	1814
Q Serve(g_s), s	1.9	7.2	7.3	1.5	0.9	1.3	0.2	1.4	2.0	18.1	0.0	13.8
Cycle Q Clear(g_c), s	1.9	7.2	7.3	1.5	0.9	1.3	0.2	1.4	2.0	18.1	0.0	13.8
Prop In Lane	1.00		0.16	1.00		1.00	1.00		1.00	1.00		0.03
Lane Grp Cap(c), veh/h	132	294	300	97	268	239	147	147	128	1271	0	672
V/C Ratio(X)	0.40	0.70	0.70	0.43	0.10	0.15	0.04	0.27	0.38	0.84	0.00	0.68
Avail Cap(c_a), veh/h	539	807	826	539	968	864	971	968	848	1888	0	985
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	29.6	25.8	25.8	32.3	25.7	25.9	29.8	30.4	30.7	26.4	0.0	19.5
Incr Delay (d2), s/veh	0.7	1.1	1.1	1.1	0.1	0.1	0.0	0.4	0.7	1.5	0.0	0.5
Initial Q Delay(d3),s/veh	17.4	2.5	2.4	0.0	0.0	0.0	0.0	0.0	0.0	25.7	0.0	4.1
%ile BackOfQ(50%),veh/ln	1.9	3.3	3.4	0.7	0.4	0.5	0.1	0.6	0.8	15.8	0.0	7.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	47.7	29.4	29.4	33.5	25.8	26.0	29.9	30.8	31.4	53.7	0.0	24.1
LnGrp LOS	D	C	C	C	C	C	C	C	C	D	A	C
Approach Vol, veh/h		469			107			95			1533	
Approach Delay, s/veh		31.5			28.9			31.0			44.8	
Approach LOS		C			C			C			D	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	8.5	15.8		29.4	7.9	16.4		10.8
Change Period (Y+Rc), s	* 4.2	5.8		5.4	* 4.2	5.8		5.1
Max Green Setting (Gmax), s	* 20	36.0		35.0	* 20	30.0		36.0
Max Q Clear Time (g_c+I1), s	3.9	3.3		20.1	3.5	9.3		4.0
Green Ext Time (p_c), s	0.0	0.2		3.8	0.0	1.3		0.3

Intersection Summary	
HCM 6th Ctrl Delay	40.6
HCM 6th LOS	D

Notes

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary
3: SR-29/SR-12/29 & Airport Blvd/SR-12

11/14/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	327	785	267	62	37	785	54	1154	63	1430	1333	40
Future Volume (veh/h)	327	785	267	62	37	785	54	1154	63	1430	1333	40
Initial Q (Qb), veh	28	25	0	4	0	0	0	0	0	6	8	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826	1826
Adj Flow Rate, veh/h	344	826	0	65	39	0	57	1215	35	1505	1403	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	5	5	5	5	5	5	5	5	5	5	5	5
Cap, veh/h	353	741		120	223		104	984	314	1047	1729	
Arrive On Green	0.22	0.22	0.00	0.06	0.06	0.00	0.06	0.22	0.22	0.34	0.51	0.00
Sat Flow, veh/h	1739	3652	1547	1739	1826	1547	1739	4985	1547	3374	3469	1547
Grp Volume(v), veh/h	344	826	0	65	39	0	57	1215	35	1505	1403	0
Grp Sat Flow(s),veh/h/ln	1739	1826	1547	1739	1826	1547	1739	1662	1547	1687	1735	1547
Q Serve(g_s), s	30.9	36.0	0.0	5.9	3.3	0.0	5.1	35.0	2.9	55.0	54.1	0.0
Cycle Q Clear(g_c), s	30.9	36.0	0.0	5.9	3.3	0.0	5.1	35.0	2.9	55.0	54.1	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	353	741		120	223		104	984	314	1047	1729	
V/C Ratio(X)	0.97	1.11		0.54	0.18		0.55	1.23	0.11	1.44	0.81	
Avail Cap(c_a), veh/h	388	815		280	294		302	1082	336	1150	1756	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	70.7	70.7	0.0	73.9	67.9	0.0	78.9	71.2	56.1	61.1	35.5	0.0
Incr Delay (d2), s/veh	37.5	68.9	0.0	3.7	0.4	0.0	1.7	114.5	0.2	202.6	3.1	0.0
Initial Q Delay(d3),s/veh	273.9	121.4	0.0	17.4	0.0	0.0	0.0	0.0	0.0	20.6	0.8	0.0
%ile BackOfQ(50%),veh/ln	46.3	36.2	0.0	4.0	1.5	0.0	2.5	24.9	1.2	55.2	24.3	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	382.0	261.0	0.0	95.0	68.2	0.0	80.6	185.7	56.4	284.4	39.4	0.0
LnGrp LOS	F	F		F	E		F	F	E	F	D	
Approach Vol, veh/h		1170			104			1307			2908	
Approach Delay, s/veh		296.6			85.0			177.6			166.2	
Approach LOS		F			F			F			F	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	14.8	88.2		16.5	61.5	41.5		41.8
Change Period (Y+Rc), s	4.7	6.5		6.5	6.5	* 6.5		5.8
Max Green Setting (Gmax), s	10.3	35.0		26.0	55.0	* 35		36.0
Max Q Clear Time (g_c+I1), s	7.9	56.1		7.9	57.0	37.0		38.0
Green Ext Time (p_c), s	0.0	0.0		0.2	0.0	0.0		0.0

Intersection Summary	
HCM 6th Ctrl Delay	195.2
HCM 6th LOS	F

Notes

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Appendix F

Queuing Calculations and Reports

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Intersection: 2: Devlin Rd & Airport Blvd

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	T	TR	L	LT	TR
Maximum Queue (ft)	47	65	42	134	110	229	94	218	187	94	102	72
Average Queue (ft)	8	17	11	51	33	90	13	112	62	39	41	24
95th Queue (ft)	30	47	35	102	79	173	53	179	136	78	79	54
Link Distance (ft)		1198	1198		1201	1201		1130		492	492	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	300			370			110		380			110
Storage Blk Time (%)								8			0	0
Queuing Penalty (veh)								20			0	0

Intersection: 3: SR-29/SR-12/29 & Airport Blvd/SR-12

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	NB
Directions Served	L	LT	T	R	L	T	R	L	T	T	T	R
Maximum Queue (ft)	100	125	117	22	220	724	1139	263	458	440	382	168
Average Queue (ft)	35	69	51	1	68	339	698	135	324	308	237	26
95th Queue (ft)	80	110	100	12	210	671	1373	230	428	410	349	96
Link Distance (ft)		1201	1201			2637	2637		1658	1658	1658	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	310			315	195			870				220
Storage Blk Time (%)					0	34					6	0
Queuing Penalty (veh)					0	14					2	0

Intersection: 3: SR-29/SR-12/29 & Airport Blvd/SR-12

Movement	SB	SB	SB	SB	SB
Directions Served	L	L	T	T	R
Maximum Queue (ft)	1171	1143	471	430	42
Average Queue (ft)	818	805	229	221	1
95th Queue (ft)	1304	1285	401	365	42
Link Distance (ft)	2526	2526	2526	2526	
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)					400
Storage Blk Time (%)				0	
Queuing Penalty (veh)				0	

Zone Summary

Zone wide Queuing Penalty: 37

Intersection: 2: Devlin Rd & Airport Blvd

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	T	TR	L	LT	TR
Maximum Queue (ft)	76	164	146	78	30	56	26	69	84	253	322	135
Average Queue (ft)	28	81	64	21	5	12	3	24	34	139	176	113
95th Queue (ft)	63	140	124	56	20	35	16	57	65	216	275	168
Link Distance (ft)		1198	1198		1201	1201		1130		492	492	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	300			370			110		380			110
Storage Blk Time (%)								0			16	2
Queuing Penalty (veh)								0			38	11

Intersection: 3: SR-29/SR-12/29 & Airport Blvd/SR-12

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	NB
Directions Served	L	LT	T	R	L	T	R	L	T	T	T	R
Maximum Queue (ft)	335	542	564	340	108	108	375	93	471	450	393	244
Average Queue (ft)	213	323	342	148	34	13	131	26	336	313	251	53
95th Queue (ft)	364	475	501	399	84	72	284	68	451	424	365	167
Link Distance (ft)		1201	1201			2637	2637		1658	1658	1658	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	310			315	195			870				220
Storage Blk Time (%)	0	10	12	0							9	0
Queuing Penalty (veh)	0	12	24	0							5	0

Intersection: 3: SR-29/SR-12/29 & Airport Blvd/SR-12

Movement	SB	SB	SB	SB	SB
Directions Served	L	L	T	T	R
Maximum Queue (ft)	1910	1885	1288	1183	127
Average Queue (ft)	1248	1232	419	356	6
95th Queue (ft)	1986	1954	1033	771	85
Link Distance (ft)	2526	2526	2526	2526	
Upstream Blk Time (%)	0	0			
Queuing Penalty (veh)	0	0			
Storage Bay Dist (ft)					400
Storage Blk Time (%)				1	0
Queuing Penalty (veh)				0	0

Zone Summary

Zone wide Queuing Penalty: 92

Intersection: 2: Devlin Rd & Airport Blvd

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	T	TR	L	LT	TR
Maximum Queue (ft)	52	63	59	128	139	282	117	241	221	121	122	92
Average Queue (ft)	13	23	17	62	43	123	16	140	90	47	51	34
95th Queue (ft)	37	54	45	114	102	227	69	214	181	92	96	72
Link Distance (ft)		1198	1198		1201	1201		1130		492	492	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	300			370			110		380			110
Storage Blk Time (%)								15			0	0
Queuing Penalty (veh)								46			0	0

Intersection: 3: SR-29/SR-12/29 & Airport Blvd/SR-12

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	NB
Directions Served	L	LT	T	R	L	T	R	L	T	T	T	R
Maximum Queue (ft)	107	150	126	51	219	2695	2693	361	579	565	517	226
Average Queue (ft)	45	84	62	3	63	2520	2591	204	423	409	351	58
95th Queue (ft)	89	132	111	24	204	3245	2974	341	551	535	490	196
Link Distance (ft)		1201	1201			2637	2637		1658	1658	1658	
Upstream Blk Time (%)						67	82					
Queuing Penalty (veh)						0	0					
Storage Bay Dist (ft)	310			315	195			870				220
Storage Blk Time (%)					0	47					23	0
Queuing Penalty (veh)					0	24					10	0

Intersection: 3: SR-29/SR-12/29 & Airport Blvd/SR-12

Movement	SB	SB	SB	SB	SB
Directions Served	L	L	T	T	R
Maximum Queue (ft)	4022	4028	4013	4001	297
Average Queue (ft)	2919	2914	2360	1576	20
95th Queue (ft)	4565	4550	4889	3863	167
Link Distance (ft)	3980	3980	3980	3980	
Upstream Blk Time (%)	24	21	9	4	
Queuing Penalty (veh)	0	0	0	0	
Storage Bay Dist (ft)					400
Storage Blk Time (%)				1	0
Queuing Penalty (veh)				2	0

Zone Summary

Zone wide Queuing Penalty: 82

Intersection: 2: Devlin Rd & Airport Blvd

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	T	TR	L	LT	TR
Maximum Queue (ft)	100	202	204	77	31	66	36	73	100	474	504	135
Average Queue (ft)	35	104	95	25	6	16	4	26	41	275	335	128
95th Queue (ft)	77	169	172	60	24	45	19	61	79	492	545	158
Link Distance (ft)		1198	1198		1201	1201		1130		492	492	
Upstream Blk Time (%)										4	7	
Queuing Penalty (veh)										29	50	
Storage Bay Dist (ft)	300			370			110		380			110
Storage Blk Time (%)		0						0			38	9
Queuing Penalty (veh)		0						0			111	62

Intersection: 3: SR-29/SR-12/29 & Airport Blvd/SR-12

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	NB
Directions Served	L	LT	T	R	L	T	R	L	T	T	T	R
Maximum Queue (ft)	335	1140	1146	340	153	93	572	431	944	912	871	245
Average Queue (ft)	296	883	889	278	44	19	273	87	694	668	607	99
95th Queue (ft)	410	1376	1367	470	108	62	502	427	1103	1065	999	260
Link Distance (ft)		1201	1201			2637	2637		1658	1658	1658	
Upstream Blk Time (%)		4	4									
Queuing Penalty (veh)		26	23									
Storage Bay Dist (ft)	310			315	195			870				220
Storage Blk Time (%)	1	56	58	0	0			0	9		59	0
Queuing Penalty (veh)	7	87	145	2	0			0	4		37	0

Intersection: 3: SR-29/SR-12/29 & Airport Blvd/SR-12

Movement	SB	SB	SB	SB	SB
Directions Served	L	L	T	T	R
Maximum Queue (ft)	4034	4037	4031	4025	212
Average Queue (ft)	3269	3263	2893	2352	11
95th Queue (ft)	4750	4738	5209	4897	124
Link Distance (ft)	3980	3980	3980	3980	
Upstream Blk Time (%)	40	41	31	14	
Queuing Penalty (veh)	0	0	0	0	
Storage Bay Dist (ft)					400
Storage Blk Time (%)				4	0
Queuing Penalty (veh)				1	0

Zone Summary

Zone wide Queuing Penalty: 586

Intersection: 2: Devlin Rd & Airport Blvd

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	T	TR	L	LT	TR
Maximum Queue (ft)	48	59	50	121	104	208	76	233	183	100	100	82
Average Queue (ft)	9	16	13	55	31	90	11	112	66	41	45	29
95th Queue (ft)	32	46	39	103	74	170	45	185	141	82	85	62
Link Distance (ft)		1198	1198		1201	1201		1130		492	492	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	300			370			110		380			110
Storage Blk Time (%)								9			0	0
Queuing Penalty (veh)								22			0	0

Intersection: 3: SR-29/SR-12/29 & Airport Blvd/SR-12

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	NB
Directions Served	L	LT	T	R	L	T	R	L	T	T	T	R
Maximum Queue (ft)	101	129	107	36	219	692	1039	276	439	427	362	225
Average Queue (ft)	37	74	49	2	52	315	548	145	310	295	230	31
95th Queue (ft)	84	117	96	21	177	636	1132	238	410	390	333	118
Link Distance (ft)		1201	1201			2637	2637		1658	1658	1658	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	310			315	195			870				220
Storage Blk Time (%)					0	33					5	0
Queuing Penalty (veh)					0	14					2	0

Intersection: 3: SR-29/SR-12/29 & Airport Blvd/SR-12

Movement	SB	SB	SB	SB
Directions Served	L	L	T	T
Maximum Queue (ft)	1147	1157	435	409
Average Queue (ft)	803	809	214	224
95th Queue (ft)	1303	1307	338	339
Link Distance (ft)	3980	3980	3980	3980
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				0
Queuing Penalty (veh)				0

Zone Summary

Zone wide Queuing Penalty: 38

Intersection: 2: Devlin Rd & Airport Blvd

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	T	TR	L	LT	TR
Maximum Queue (ft)	87	156	146	79	25	67	29	73	83	263	353	135
Average Queue (ft)	27	79	64	21	5	15	4	23	32	145	182	113
95th Queue (ft)	64	131	120	55	20	43	19	57	65	230	297	168
Link Distance (ft)		1198	1198		1201	1201		1130		492	492	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	300			370			110		380			110
Storage Blk Time (%)								0			17	2
Queuing Penalty (veh)								0			41	12

Intersection: 3: SR-29/SR-12/29 & Airport Blvd/SR-12

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	NB
Directions Served	L	LT	T	R	L	T	R	L	T	T	T	R
Maximum Queue (ft)	335	552	574	340	115	58	316	108	463	438	370	231
Average Queue (ft)	215	324	332	140	36	13	118	34	328	309	248	49
95th Queue (ft)	367	494	507	379	88	42	240	83	431	410	353	151
Link Distance (ft)		1201	1201			2637	2637		1658	1658	1658	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	310			315	195			870				220
Storage Blk Time (%)	0	10	11	0							8	0
Queuing Penalty (veh)	1	14	24	0							4	0

Intersection: 3: SR-29/SR-12/29 & Airport Blvd/SR-12

Movement	SB	SB	SB	SB	SB
Directions Served	L	L	T	T	R
Maximum Queue (ft)	1773	1784	1238	1089	42
Average Queue (ft)	1235	1244	361	344	1
95th Queue (ft)	2070	2069	839	722	41
Link Distance (ft)	3980	3980	3980	3980	
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)					400
Storage Blk Time (%)				1	0
Queuing Penalty (veh)				0	0

Zone Summary

Zone wide Queuing Penalty: 97

Intersection: 2: Devlin Rd & Airport Blvd

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	T	TR	L	LT	TR
Maximum Queue (ft)	48	60	56	123	106	224	68	201	166	90	95	80
Average Queue (ft)	9	17	12	51	31	92	12	106	63	36	40	27
95th Queue (ft)	31	45	39	102	77	176	44	170	134	74	77	57
Link Distance (ft)		1198	1198		1201	1201		1130		492	492	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	300			370			110		380			110
Storage Blk Time (%)								7			0	0
Queuing Penalty (veh)								18			0	0

Intersection: 3: SR-29/SR-12/29 & Airport Blvd/SR-12

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	NB
Directions Served	L	LT	T	R	L	T	R	L	T	T	T	R
Maximum Queue (ft)	96	122	115	32	220	593	938	274	422	406	364	209
Average Queue (ft)	34	71	48	2	57	251	455	141	311	290	223	27
95th Queue (ft)	76	112	97	21	188	478	928	243	397	376	321	102
Link Distance (ft)		1201	1201			2637	2637		1658	1658	1658	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	310			315	195			870				220
Storage Blk Time (%)					0	24					4	0
Queuing Penalty (veh)					0	10					1	0

Intersection: 3: SR-29/SR-12/29 & Airport Blvd/SR-12

Movement	SB	SB	SB	SB
Directions Served	L	L	T	T
Maximum Queue (ft)	1067	1064	439	371
Average Queue (ft)	770	780	209	220
95th Queue (ft)	1273	1273	380	326
Link Distance (ft)	3980	3980	3980	3980
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				0
Queuing Penalty (veh)				0

Zone Summary

Zone wide Queuing Penalty: 29

Intersection: 2: Devlin Rd & Airport Blvd

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	T	TR	L	LT	TR
Maximum Queue (ft)	76	150	131	71	28	68	26	72	84	267	337	135
Average Queue (ft)	29	80	63	21	5	16	4	22	34	141	175	111
95th Queue (ft)	63	133	116	54	20	44	17	57	66	223	283	169
Link Distance (ft)		1198	1198		1201	1201		1130		492	492	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	300			370			110		380			110
Storage Blk Time (%)								0			15	2
Queuing Penalty (veh)								0			36	13

Intersection: 3: SR-29/SR-12/29 & Airport Blvd/SR-12

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	NB
Directions Served	L	LT	T	R	L	T	R	L	T	T	T	R
Maximum Queue (ft)	335	507	515	340	108	83	324	105	458	436	385	244
Average Queue (ft)	198	308	317	131	36	14	124	31	328	304	251	60
95th Queue (ft)	344	456	464	365	86	52	265	79	430	407	362	182
Link Distance (ft)		1201	1201			2637	2637		1658	1658	1658	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	310			315	195			870				220
Storage Blk Time (%)	0	9	10	0							9	0
Queuing Penalty (veh)	0	11	20	0							5	0

Intersection: 3: SR-29/SR-12/29 & Airport Blvd/SR-12

Movement	SB	SB	SB	SB	SB
Directions Served	L	L	T	T	R
Maximum Queue (ft)	1921	1908	1366	969	42
Average Queue (ft)	1253	1259	358	322	1
95th Queue (ft)	2016	2012	875	656	42
Link Distance (ft)	3980	3980	3980	3980	
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)					400
Storage Blk Time (%)				1	
Queuing Penalty (veh)				0	

Zone Summary

Zone wide Queuing Penalty: 86

Intersection: 2: Devlin Rd & Airport Blvd

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	T	TR	L	LT	TR
Maximum Queue (ft)	43	68	48	132	105	217	106	212	181	106	104	88
Average Queue (ft)	9	18	11	54	33	100	13	120	65	44	47	27
95th Queue (ft)	31	50	36	109	78	182	57	187	139	85	88	62
Link Distance (ft)		1198	1198		1201	1201		1130		492	492	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	300			370			110		380			110
Storage Blk Time (%)							0	10			0	0
Queuing Penalty (veh)							0	26			0	0

Intersection: 3: SR-29/SR-12/29 & Airport Blvd/SR-12

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	NB
Directions Served	L	LT	T	R	L	T	R	L	T	T	T	R
Maximum Queue (ft)	102	131	116	34	220	618	856	287	427	402	350	189
Average Queue (ft)	42	76	54	2	60	321	454	149	308	291	227	27
95th Queue (ft)	87	121	103	20	196	610	884	249	398	381	328	100
Link Distance (ft)		1201	1201			2637	2637		1658	1658	1658	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	310			315	195			870				220
Storage Blk Time (%)						38					5	0
Queuing Penalty (veh)						16					2	0

Intersection: 3: SR-29/SR-12/29 & Airport Blvd/SR-12

Movement	SB	SB	SB	SB
Directions Served	L	L	T	T
Maximum Queue (ft)	1043	1053	396	423
Average Queue (ft)	692	707	216	229
95th Queue (ft)	1171	1182	355	353
Link Distance (ft)	3980	3980	3980	3980
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				0
Queuing Penalty (veh)				0

Zone Summary

Zone wide Queuing Penalty: 44

Intersection: 2: Devlin Rd & Airport Blvd

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	T	TR	L	LT	TR
Maximum Queue (ft)	74	161	155	69	32	48	31	66	77	284	346	135
Average Queue (ft)	27	79	68	23	5	13	4	21	33	152	191	113
95th Queue (ft)	61	134	128	57	20	34	19	52	62	243	306	169
Link Distance (ft)		1198	1198		1201	1201		1130		492	492	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	300			370			110		380			110
Storage Blk Time (%)								0			18	2
Queuing Penalty (veh)								0			43	12

Intersection: 3: SR-29/SR-12/29 & Airport Blvd/SR-12

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	NB
Directions Served	L	LT	T	R	L	T	R	L	T	T	T	R
Maximum Queue (ft)	334	540	554	340	122	56	330	107	451	436	369	211
Average Queue (ft)	212	325	335	153	37	13	122	36	328	305	245	45
95th Queue (ft)	363	498	510	389	92	41	257	85	427	400	345	138
Link Distance (ft)		1201	1201			2637	2637		1658	1658	1658	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	310			315	195			870				220
Storage Blk Time (%)	0	11	11	0							8	0
Queuing Penalty (veh)	0	14	25	0							4	0

Intersection: 3: SR-29/SR-12/29 & Airport Blvd/SR-12

Movement	SB	SB	SB	SB	SB
Directions Served	L	L	T	T	R
Maximum Queue (ft)	1579	1580	972	886	127
Average Queue (ft)	1113	1123	312	313	6
95th Queue (ft)	1731	1739	674	636	86
Link Distance (ft)	3980	3980	3980	3980	
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)					400
Storage Blk Time (%)				1	
Queuing Penalty (veh)				0	

Zone Summary

Zone wide Queuing Penalty: 100

Intersection: 2: Devlin Rd & Airport Blvd

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	T	TR	L	LT	TR
Maximum Queue (ft)	53	84	57	145	115	248	127	244	203	117	124	123
Average Queue (ft)	11	24	17	60	38	117	18	138	90	51	56	39
95th Queue (ft)	35	59	46	116	89	212	72	214	177	95	101	89
Link Distance (ft)		1198	1198		1201	1201		1130		492	492	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	300			370			110		380			110
Storage Blk Time (%)								15			1	0
Queuing Penalty (veh)								48			1	0

Intersection: 3: SR-29/SR-12/29 & Airport Blvd/SR-12

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	NB
Directions Served	L	LT	T	R	L	T	R	L	T	T	T	R
Maximum Queue (ft)	118	150	134	48	219	2694	2692	362	597	573	525	245
Average Queue (ft)	51	83	64	3	53	2598	2638	194	429	412	354	61
95th Queue (ft)	100	134	114	24	178	3059	2824	321	574	559	509	202
Link Distance (ft)		1201	1201			2637	2637		1658	1658	1658	
Upstream Blk Time (%)						71	87					
Queuing Penalty (veh)						0	0					
Storage Bay Dist (ft)	310			315	195			870				220
Storage Blk Time (%)					0	42			0		23	0
Queuing Penalty (veh)					0	21			0		10	0

Intersection: 3: SR-29/SR-12/29 & Airport Blvd/SR-12

Movement	SB	SB	SB	SB	SB
Directions Served	L	L	T	T	R
Maximum Queue (ft)	4023	4028	4018	3998	296
Average Queue (ft)	3077	3072	2569	1639	18
95th Queue (ft)	4606	4588	5017	3794	160
Link Distance (ft)	3980	3980	3980	3980	
Upstream Blk Time (%)	26	23	7	3	
Queuing Penalty (veh)	0	0	0	0	
Storage Bay Dist (ft)					400
Storage Blk Time (%)				1	0
Queuing Penalty (veh)				2	0

Zone Summary

Zone wide Queuing Penalty: 83

Intersection: 2: Devlin Rd & Airport Blvd

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	T	TR	L	LT	TR
Maximum Queue (ft)	105	222	222	82	25	54	28	76	104	519	522	135
Average Queue (ft)	40	117	108	29	5	16	5	28	42	386	421	132
95th Queue (ft)	85	191	192	65	20	40	20	62	82	609	610	148
Link Distance (ft)		1198	1198		1201	1201		1130		492	492	
Upstream Blk Time (%)										13	21	
Queuing Penalty (veh)										99	161	
Storage Bay Dist (ft)	300			370			110		380			110
Storage Blk Time (%)		0						0			53	13
Queuing Penalty (veh)		0						0			153	99

Intersection: 3: SR-29/SR-12/29 & Airport Blvd/SR-12

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	NB
Directions Served	L	LT	T	R	L	T	R	L	T	T	T	R
Maximum Queue (ft)	335	1238	1248	340	126	72	590	356	853	828	752	245
Average Queue (ft)	305	1109	1109	291	45	20	269	73	627	601	540	93
95th Queue (ft)	403	1383	1379	460	101	56	505	330	957	929	847	244
Link Distance (ft)		1201	1201			2637	2637		1658	1658	1658	
Upstream Blk Time (%)		9	9									
Queuing Penalty (veh)		61	58									
Storage Bay Dist (ft)	310			315	195			870				220
Storage Blk Time (%)	3	65	66	1					4		55	0
Queuing Penalty (veh)	16	104	174	2					2		35	0

Intersection: 3: SR-29/SR-12/29 & Airport Blvd/SR-12

Movement	SB	SB	SB	SB	SB
Directions Served	L	L	T	T	R
Maximum Queue (ft)	4031	4034	4029	4022	297
Average Queue (ft)	3214	3211	2855	2258	15
95th Queue (ft)	4721	4713	5116	4732	146
Link Distance (ft)	3980	3980	3980	3980	
Upstream Blk Time (%)	37	37	27	13	
Queuing Penalty (veh)	0	0	0	0	
Storage Bay Dist (ft)					400
Storage Blk Time (%)				5	0
Queuing Penalty (veh)				2	0

Zone Summary

Zone wide Queuing Penalty: 967

Intersection: 2: Devlin Rd & Airport Blvd

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	T	TR	L	LT	TR
Maximum Queue (ft)	50	68	56	146	129	242	134	240	204	101	120	106
Average Queue (ft)	10	23	14	63	40	118	18	141	92	47	52	35
95th Queue (ft)	33	56	43	122	93	212	72	217	183	88	97	76
Link Distance (ft)		1198	1198		1201	1201		1130		492	492	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	300			370			110		380			110
Storage Blk Time (%)								16			0	0
Queuing Penalty (veh)								51			0	0

Intersection: 3: SR-29/SR-12/29 & Airport Blvd/SR-12

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	NB
Directions Served	L	LT	T	R	L	T	R	L	T	T	T	R
Maximum Queue (ft)	111	152	125	45	220	2695	2692	385	590	570	530	243
Average Queue (ft)	48	82	58	3	63	2562	2614	205	421	406	352	55
95th Queue (ft)	98	134	110	23	203	3168	2951	343	572	559	515	190
Link Distance (ft)		1201	1201			2637	2637		1658	1658	1658	
Upstream Blk Time (%)						69	86					
Queuing Penalty (veh)						0	0					
Storage Bay Dist (ft)	310			315	195			870				220
Storage Blk Time (%)					0	44					24	0
Queuing Penalty (veh)					0	22					11	0

Intersection: 3: SR-29/SR-12/29 & Airport Blvd/SR-12

Movement	SB	SB	SB	SB	SB
Directions Served	L	L	T	T	R
Maximum Queue (ft)	4023	4021	4009	3972	170
Average Queue (ft)	2994	2985	2458	1596	7
95th Queue (ft)	4572	4559	4945	3813	97
Link Distance (ft)	3980	3980	3980	3980	
Upstream Blk Time (%)	24	23	10	6	
Queuing Penalty (veh)	0	0	0	0	
Storage Bay Dist (ft)					400
Storage Blk Time (%)				1	0
Queuing Penalty (veh)				2	0

Zone Summary

Zone wide Queuing Penalty: 86

Intersection: 2: Devlin Rd & Airport Blvd

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	T	TR	L	LT	TR
Maximum Queue (ft)	95	196	200	81	32	58	30	79	90	478	510	135
Average Queue (ft)	35	107	96	28	6	17	4	29	42	304	361	130
95th Queue (ft)	74	177	172	67	22	41	19	64	78	525	563	153
Link Distance (ft)		1198	1198		1201	1201		1130		492	492	
Upstream Blk Time (%)										6	10	
Queuing Penalty (veh)										43	78	
Storage Bay Dist (ft)	300			370			110		380			110
Storage Blk Time (%)		0						0			44	10
Queuing Penalty (veh)		0						0			127	74

Intersection: 3: SR-29/SR-12/29 & Airport Blvd/SR-12

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	NB
Directions Served	L	LT	T	R	L	T	R	L	T	T	T	R
Maximum Queue (ft)	335	1226	1230	340	134	70	626	194	776	764	712	245
Average Queue (ft)	300	945	951	268	43	17	272	61	588	566	505	99
95th Queue (ft)	407	1435	1428	467	102	51	512	280	852	821	761	260
Link Distance (ft)		1201	1201			2637	2637		1658	1658	1658	
Upstream Blk Time (%)		5	5									
Queuing Penalty (veh)		36	36									
Storage Bay Dist (ft)	310			315	195			870				220
Storage Blk Time (%)	1	58	59	0	0				2		52	0
Queuing Penalty (veh)	6	90	151	1	0				1		33	0

Intersection: 3: SR-29/SR-12/29 & Airport Blvd/SR-12

Movement	SB	SB	SB	SB	SB
Directions Served	L	L	T	T	R
Maximum Queue (ft)	4030	4032	4030	4020	382
Average Queue (ft)	3192	3191	2828	2181	30
95th Queue (ft)	4700	4688	5094	4599	208
Link Distance (ft)	3980	3980	3980	3980	
Upstream Blk Time (%)	34	34	24	11	
Queuing Penalty (veh)	0	0	0	0	
Storage Bay Dist (ft)					400
Storage Blk Time (%)				5	0
Queuing Penalty (veh)				2	0

Zone Summary

Zone wide Queuing Penalty: 680

Intersection: 2: Devlin Rd & Airport Blvd

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	T	TR	L	LT	TR
Maximum Queue (ft)	47	64	59	140	114	273	110	262	220	113	116	114
Average Queue (ft)	10	19	16	61	40	119	16	142	89	52	53	36
95th Queue (ft)	32	49	45	118	89	218	68	217	178	95	96	78
Link Distance (ft)		1198	1198		1201	1201		1130		492	492	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	300			370			110		380			110
Storage Blk Time (%)								16			0	0
Queuing Penalty (veh)								52			0	0

Intersection: 3: SR-29/SR-12/29 & Airport Blvd/SR-12

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	NB
Directions Served	L	LT	T	R	L	T	R	L	T	T	T	R
Maximum Queue (ft)	117	155	130	81	220	2696	2698	348	564	547	507	245
Average Queue (ft)	49	83	58	7	60	2552	2611	193	418	402	346	54
95th Queue (ft)	98	134	111	43	196	3185	2962	307	558	547	500	185
Link Distance (ft)		1201	1201			2637	2637		1658	1658	1658	
Upstream Blk Time (%)						71	85					
Queuing Penalty (veh)						0	0					
Storage Bay Dist (ft)	310			315	195			870				220
Storage Blk Time (%)					0	36					21	0
Queuing Penalty (veh)					0	18					10	0

Intersection: 3: SR-29/SR-12/29 & Airport Blvd/SR-12

Movement	SB	SB	SB	SB	SB
Directions Served	L	L	T	T	R
Maximum Queue (ft)	4029	4026	4007	3997	337
Average Queue (ft)	3034	3025	2481	1604	18
95th Queue (ft)	4548	4531	4927	3888	159
Link Distance (ft)	3980	3980	3980	3980	
Upstream Blk Time (%)	26	23	9	4	
Queuing Penalty (veh)	0	0	0	0	
Storage Bay Dist (ft)					400
Storage Blk Time (%)				1	0
Queuing Penalty (veh)				1	0

Zone Summary

Zone wide Queuing Penalty: 82

Intersection: 2: Devlin Rd & Airport Blvd

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	T	TR	L	LT	TR
Maximum Queue (ft)	87	194	188	70	36	63	26	68	101	488	494	135
Average Queue (ft)	36	105	95	24	7	20	4	23	42	297	354	130
95th Queue (ft)	76	174	164	56	25	50	19	55	82	530	563	154
Link Distance (ft)		1198	1198		1201	1201		1130		492	492	
Upstream Blk Time (%)										7	11	
Queuing Penalty (veh)										53	82	
Storage Bay Dist (ft)	300			370			110		380			110
Storage Blk Time (%)								0			40	10
Queuing Penalty (veh)								0			117	76

Intersection: 3: SR-29/SR-12/29 & Airport Blvd/SR-12

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	NB
Directions Served	L	LT	T	R	L	T	R	L	T	T	T	R
Maximum Queue (ft)	335	1165	1159	340	129	73	572	360	942	895	829	245
Average Queue (ft)	301	865	870	281	46	17	273	68	651	623	568	102
95th Queue (ft)	403	1394	1391	468	103	53	521	314	986	955	889	263
Link Distance (ft)		1201	1201			2637	2637		1658	1658	1658	
Upstream Blk Time (%)		5	4									
Queuing Penalty (veh)		32	30									
Storage Bay Dist (ft)	310			315	195			870				220
Storage Blk Time (%)	2	53	55	0	0				6		59	0
Queuing Penalty (veh)	9	87	147	2	0				3		37	0

Intersection: 3: SR-29/SR-12/29 & Airport Blvd/SR-12

Movement	SB	SB	SB	SB	SB
Directions Served	L	L	T	T	R
Maximum Queue (ft)	4030	4034	4027	4021	340
Average Queue (ft)	3299	3292	2943	2318	21
95th Queue (ft)	4703	4697	5159	4865	173
Link Distance (ft)	3980	3980	3980	3980	
Upstream Blk Time (%)	39	39	29	13	
Queuing Penalty (veh)	0	0	0	0	
Storage Bay Dist (ft)					400
Storage Blk Time (%)				5	0
Queuing Penalty (veh)				2	0

Zone Summary

Zone wide Queuing Penalty: 677

Appendix G

Fire Access Circulation

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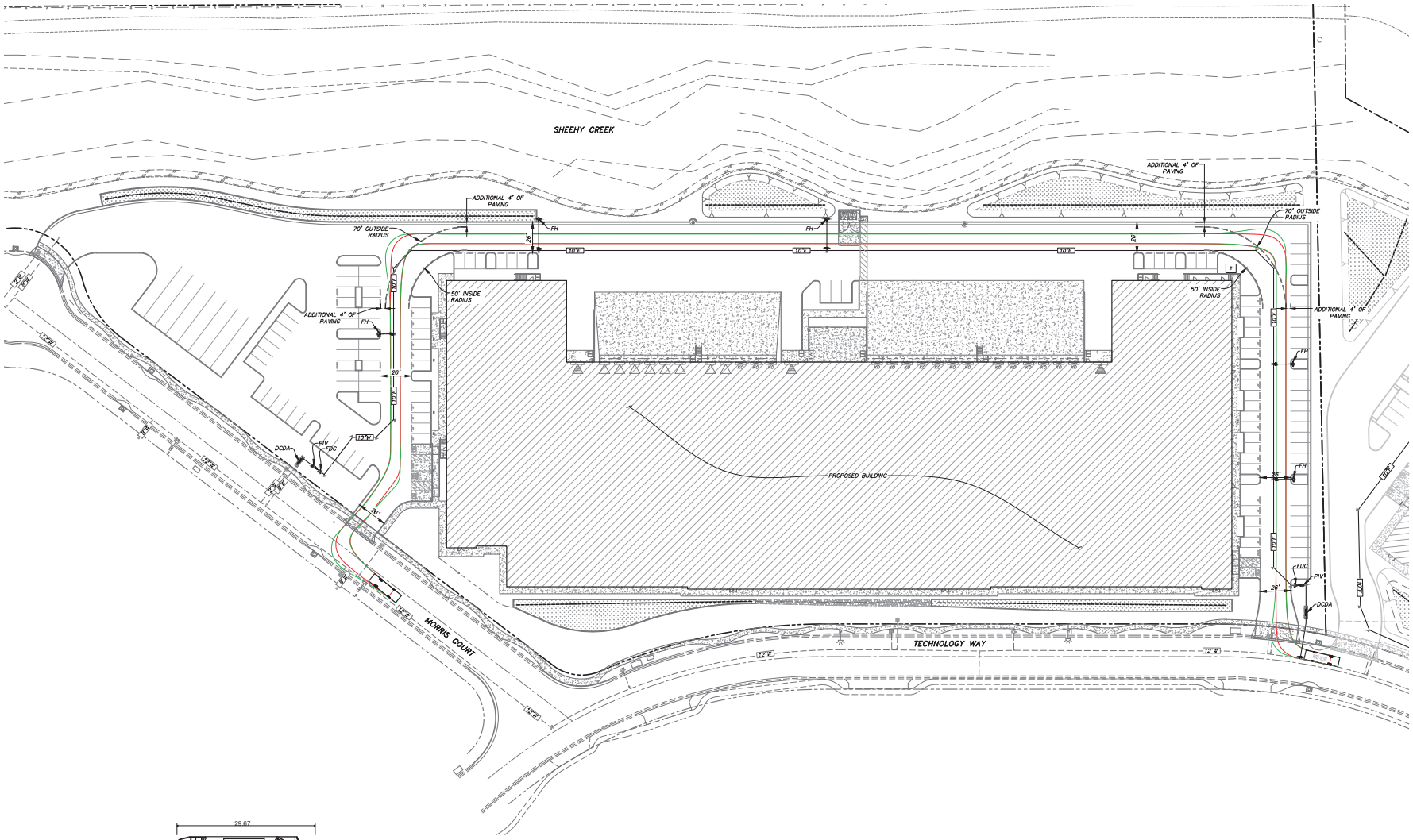
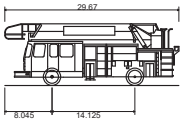


LEGEND

BODY ENVELOPE

OUTER WHEEL WALLS



PIERCE - VEL7000

Overall Length	29.670ft
Overall Width	8.000ft
Overall Body Height	10.514ft
Min Body Ground Clearance	0.944ft
Track Width	8.470ft
Lock-to-lock time	6.00s
Wall to Wall Turning Radius	30.000ft

1 NAPA COUNTY FIRE ENGINE

NTS

0 20 40 80

SCALE: 1"=40'

RMW
Architecture
Interiors

1718 Third Street
Suite 101
Sacramento
California 95811

Office
916 449-1400

rmw.com

OWNER / DEVELOPER:

E & P PROPERTIES

5400 INDUSTRIAL WAY,
BENICIA, CA 94510

PRELIMINARY DESIGN DOCUMENTS FOR:

NEW WINERY AND WINE STORAGE FACILITY BUILDING A

TECHNOLOGY WAY & MORRIS COURT
NAPA COUNTY, CALIFORNIA

approved for the owner by :

approved for the architect by :

issue :	description :	date :
A	INITIAL PLANNING REVIEW	07-27-2022
B	REISSUED FOR PLANNING REVIEW	01-31-2023

GENERAL CONTRACTOR:

drawn by : PJ plot date : 01-31-2023

checked by : PF

stamp

REGISTERED PROFESSIONAL ENGINEER BRIAN P. BONING No. 41804 CIVIL STATE OF CALIFORNIA

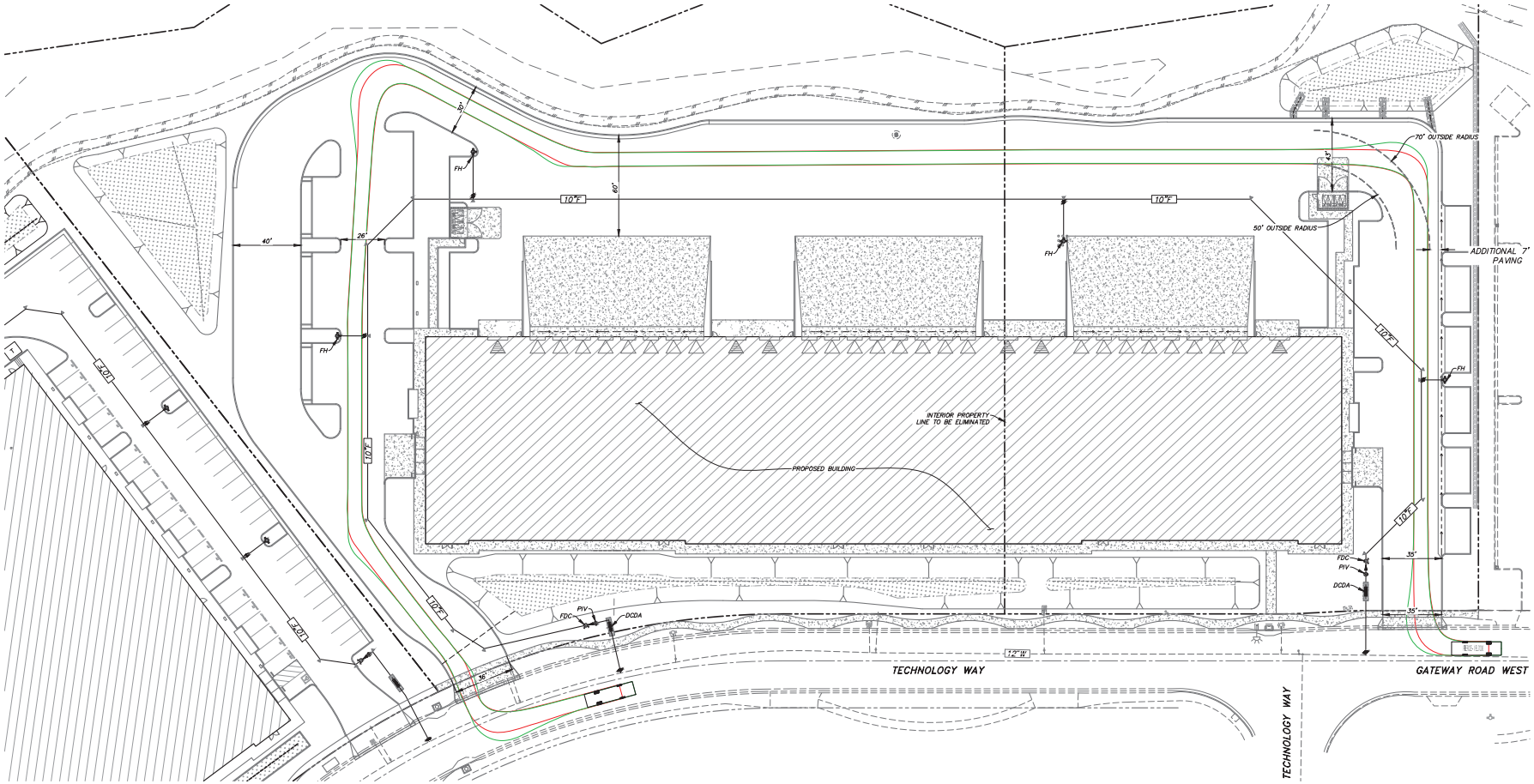
scale : AS NOTED

project number : 3687-13

FIRE PLAN

sheet no. : C901

File Name: X:\Land Projects\3687-13\dwg\3687-13_A_C901.dwg Date Plotted: February 02, 2023 – 8:59am



RMW
Architecture
Interiors

1718 Third Street
Suite 101
Sacramento
California 95811

Office
916 449-1400

rmw.com

OWNER / DEVELOPER:

E & P
PROPERTIES

5400 INDUSTRIAL WAY,
BENICIA, CA 94510

PRELIMINARY DESIGN DOCUMENTS FOR:

NEW WAREHOUSE
BUILDING B

TECHNOLOGY WAY & MORRIS COURT
NAPA COUNTY, CALIFORNIA

approved for the owner by :

approved for the architect by :

issue :	description :	date :
A	INITIAL PLANNING REVIEW	07-27-2022
B	REISSUED FOR PLANNING REVIEW	01-31-2023

GENERAL CONTRACTOR:

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REGISTERED PROFESSIONAL ENGINEER
BRIAN P. BONINO
No. 41804
CIVIL
STATE OF CALIFORNIA

scale : AS NOTED

project number : 3687-13

FIRE PLAN

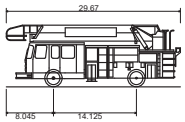
sheet no. :

C901

LEGEND

BODY ENVELOPE

OUTER WHEEL WALLS



PIERCE - VEL7000

Overall Length	29.670ft
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Wall to Wall Turning Radius	30.000ft

1 NAPA COUNTY FIRE ENGINE
NTS

0 15 30 60
SCALE: 1"=30'

File Name: X:\Land Projects\3687-13\dwg\3687-13_B_C901.dwg Date Plotted: February 02, 2023 - 8:25am