



HEXAGON TRANSPORTATION CONSULTANTS, INC.

Memorandum

Date: December 10, 2021
To: City of South San Francisco
CC: Mr. Peter Sodini
From: Trisha Dudala, P.E.
Subject: 421 Cypress Avenue Transportation Study – South San Francisco, California

Introduction

This report presents the results of the transportation study for the proposed mixed-use project at 421 Cypress Avenue in South San Francisco, CA (see Figure 1). The proposed development is located on three parcels: 421 Cypress Avenue, 209 Lux Avenue, and 213 Lux Avenue. The project would replace the existing Bertolucci Restaurant building and an adjoining surface parking lot with a new building, which would contain a smaller restaurant space and 99 dwelling units and on-site parking. The project site is bordered by Lux Avenue to the north, Tamarack Lane to the south, Cypress Avenue to the east, and residential buildings to the west. Vehicular access to the project would be provided via two right-in and right-out driveways from Tamarack Lane, which is a one-way street.

The project is located in the Downtown Station Area Specific Plan, which covers properties within 0.5 miles of the City's Caltrain Station. The City of South San Francisco completed the Downtown Station Area Specific Plan (DSASP) and EIR that was adopted in February 2015. The land uses proposed for this project are consistent with those set forth in the DSASP EIR.

Vehicle Miles Travelled (VMT) Analysis

Pursuant to SB 743, the CEQA 2019 Update Guidelines Section 15064.3, subdivision (b) states that vehicle miles travelled (VMT) will be the metric in analyzing transportation impacts for land use projects for California Environmental Quality Act (CEQA) purposes. The City of South San Francisco has adopted thresholds of significance to guide in determining when a project will have a significant transportation impact.

The City of South San Francisco provides screening criteria for development projects. The criteria are based on the type of project, characteristics, and/or location. If a project meets the City's screening criteria, the project is expected to result in less-than-significant impacts, and a detailed CEQA VMT analysis is not required. The City's policy states that projects within ½ mile of an existing or planned high-quality transit corridor or major transit station should be presumed to have a less-than-significant impact on VMT. However, this presumption would not apply if the project FAR is less than 0.75, includes parking that is higher than required by the City, is inconsistent with Plan Bay Area, or replaces affordable residential units with a smaller number of market-rate units. The project site is located within half mile of the South San Francisco Caltrain Station and the high-quality transit service provided by SamTrans route 130. The project is proposing an FAR of 4.70, fewer than the required number of parking spaces, is consistent with the Downtown Station Area Specific Plan (DSASP) and would provide 15% below market rate (BMR) units. Therefore, the project is expected to result in a less-than-significant VMT impact.



Local Transportation Analysis (LTA) Scope of Study

Although the project is consistent with the DSASP EIR, a local transportation analysis was conducted to evaluate project adverse effects and to identify improvements that would be triggered by the project at key intersections located in the immediate vicinity of the project site.

The adverse effects of the project were evaluated following the standards and methodologies set forth by the City of South San Francisco. Traffic operations for the following 5 intersections were analyzed.

Study Intersections

1. Miller Avenue/Linden Avenue
2. Miller Avenue/Cypress Avenue
3. Miller Avenue/Airport Boulevard
4. Grand Avenue/Linden Avenue
5. Grand Avenue/Airport Boulevard

Traffic conditions at the intersections were analyzed for the weekday AM and PM peak hours of traffic. The AM peak hour of traffic is generally between 7:00 and 9:00 AM, and the PM peak hour is typically between 4:00 and 6:00 PM. It is during these periods that the most congested traffic conditions occur on an average weekday.

Traffic conditions were evaluated for the following scenarios:

1. **Existing Conditions.** Since traffic conditions have not returned to pre-pandemic levels, the existing conditions analysis was based on traffic volumes that occurred prior to the COVID-19 pandemic. AM and PM peak hour volumes at intersections 3, 4 and 5 were based on historical counts from September and November 2019. No historical counts were available at intersections 1 and 2. New AM and PM peak hour counts were conducted in November 2021 at all 5 study intersections and 2021 counts at intersections 1 and 2 were adjusted to reflect pre-pandemic traffic levels by applying a growth factor of 1.143 during the AM peak hour and 1.134 during the PM peak hour. The growth factor was based on comparing 2019 and 2021 AM and PM peak hour volumes at intersections 3, 4 and 5. All of the study intersections were evaluated based on the level of service analysis described in the DSASP EIR.
2. **Background Conditions.** Background conditions were analyzed with traffic volumes that would exist when approved projects in the study area are constructed and occupied. Based on coordination with the City of South San Francisco Planning Division, five approved projects were identified in the study area. Trip generation for the approved projects was either based on traffic studies conducted for these projects or based on the ITE trip generation manual. Trips generated by approved projects were added to existing conditions to analyze background conditions.
3. **Background Plus Project Conditions.** Project generated traffic was estimated using the vehicular trip generation rates recommended by the Institute of Transportation Engineers (ITE) manual entitled *Trip Generation, 11th Edition*. Traffic volumes with the project (hereafter called *project traffic volumes*) were estimated by adding trips generated by the proposed mixed-use project to background volumes. Intersection deficiencies associated with the development of the proposed project were evaluated relative to background conditions.



Figure 1
Site Location and Study Intersections

Methodology

Traffic conditions at the study intersections were evaluated using level of service (LOS). *Level of Service* is a qualitative description of operating conditions ranging from LOS A, or free-flow conditions with little or no delay, to LOS F, or jammed conditions with excessive delays.

This study utilizes Synchro software to determine intersection level of service. The Synchro software implements the *Highway Capacity Manual* (HCM) methodology for signalized and unsignalized intersections. The HCM method evaluates intersection operations on the basis of average control delay time (measured in seconds per vehicle) for all vehicles at the intersection. This average delay can then be correlated to a level of service as shown in Table 1 for signalized intersections. The level of service correlation for unsignalized, stopped-controlled intersections is shown in Table 2. For stop-controlled intersections, level of service depends on the average delay experienced by vehicles on the stop-controlled approaches. Thus, for two-way or T-intersections, operations are defined by the average control delay experienced by vehicles entering the intersection from the stop-controlled approaches on minor streets or from left-turn approaches on major streets.

LOS for the study intersections were analyzed using the Highway Capacity Manual (HCM) 6th edition methodology to maintain consistency with previous studies. For intersections that could not be analyzed using the 6th edition, HCM 2000 was used.

Table 1 – Signalized Intersection Level of Service Definitions Based on Control Delay

Level of Service	Description	Average Control Delay Per Vehicle (sec.)
A	Signal progression is extremely favorable. Most vehicles arrive during the green phase and do not stop at all. Short cycle lengths may also contribute to the very low vehicle delay.	10.0 or less
B	Operations characterized by good signal progression and/or short cycle lengths. More vehicles stop than with LOS A, causing higher levels of average vehicle delay.	10.1 to 20.0
C	Higher delays may result from fair signal progression and/or longer cycle lengths. Individual cycle failures may begin to appear at this level. The number of vehicles stopping is significant, though some vehicles may still pass through the intersection without stopping.	20.1 to 35.0
D	The influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable signal progression, long cycle lengths, or high volume-to-capacity (V/C) ratios. Many vehicles stop and individual cycle failures are noticeable.	35.1 to 55.0
E	This is considered to be the limit of acceptable delay. These high delay values generally indicate poor signal progression, long cycle lengths, and high volume-to-capacity (V/C) ratios. Individual cycle failures occur frequently.	55.1 to 80.0
F	This level of delay is considered unacceptable by most drivers. This condition often occurs with oversaturation, that is, when arrival flow rates exceed the capacity of the intersection. Poor progression and long cycle lengths may also be major contributing causes of such delay levels.	greater than 80.0

Source: Transportation Research Board, *Highway Capacity Manual*

Table 2
Unsignalized Intersection Level of Service Definitions Based on Control Delay

Level of Service	Description	Average Delay Per Vehicle (Sec.)
A	Little or no traffic delay	10.0 or less
B	Short traffic delays	10.1 to 15.0
C	Average traffic delays	15.1 to 25.0
D	Long traffic delays	25.1 to 35.0
E	Very long traffic delays	35.1 to 50.0
F	Extreme traffic delays	greater than 50.0

Source: Transportation Research Board, *Highway Capacity Manual*

Regulatory Framework

Existing policies, laws and regulations that apply to the proposed project are summarized below. The City of South San Francisco has jurisdiction over all City streets and City-operated traffic signals. State Routes, including US-101, are under the jurisdiction of California Department of Transportation (Caltrans). Public transit agencies with operations in the study area are SamTrans, Caltrain, and BART.

City of South San Francisco General Plan

The transportation and Circulation Element of the City of South San Francisco General Plan addresses the location and extent of existing and planned transportation routes, terminals, and other public utilities and facilities. The General Plan identifies roadway and transit goals and policies that have been adopted to ensure that the transportation system of the City will have adequate capacity to serve planned growth. These goals and policies are intended to provide a plan and implementation measures for an integrated, multi-modal transportation system that will safely and efficiently meet the transportation needs of all economic and social segments of the City.

Thresholds of Significance

The City of South San Francisco defines LOS A through D as acceptable, and LOS E and F as unacceptable. The following guidelines are outlined in the City of South San Francisco General Plan (City of South San Francisco 1999):

- Strive to maintain LOS D or better on arterial and collector streets.
- Accept LOS E or F after finding that there is no feasible and practical way to mitigate the lower level of service, and the uses resulting in the lower level of service are of clear overall public benefit.
- Exempt development within 0.25 mile of a Caltrain or BART station, or a ferry terminal, from LOS standards.

The proposed project is located 0.25 mile from the existing Caltrain station. Although the project is exempt from LOS standards, a level of service analysis was conducted to maintain consistency with the DSASP EIR.

The criteria below are used to determine whether implementation of the proposed project would result in an adverse effect that requires improvement.

Intersection LOS Adverse Effect Criteria

A project will create an adverse effect on traffic conditions at intersections:

- If a signalized intersection with base traffic volumes operating at an acceptable LOS (LOS D or better) deteriorates to an unacceptable operation (LOS E or F) with the addition of project traffic, and the total traffic volume through the intersection increases by at least two percent (2%); or
- If a signalized intersection is already operating at an unacceptable LOS, and the proposed project increases the total traffic volume at the intersection by at least two percent (2%); or
- If the addition of project traffic at intersections in the vicinity of freeway interchanges would increase acceptable baseline 95th percentile vehicle queues to unacceptable levels (as determined by the Synchro software program and the storage length of each movement), or, if baseline 95th percentile vehicle queues are already at unacceptable levels, the project would increase the traffic volume in the queue by at least one percent (1%).

Existing Roadway Network

Regional access to the project study area is provided by US 101.

US 101 is a north-south major freeway through eastern San Mateo County between San Francisco and San Jose. It is the primary north/south route connection to I-280 and I-80 north of South San Francisco. US-101 consists of eight lanes in the study area and is typically congested in both directions during both peak periods as people commute to and from San Francisco and the Silicon Valley. Access to the freeway from the project site is provided via interchanges at Airport Boulevard/Produce Avenue, Grand Avenue and Miller Avenue.

The following roadways provide local access to the site:

Airport Boulevard is a major north/south four- to six-lane arterial route through South San Francisco parallel to US-101 that transitions into Bayshore Boulevard in the north and to Produce Avenue in the south. The posted speed limit on Airport Boulevard is 35 MPH near the project vicinity. Airport Boulevard provides access to the site via Grand Avenue, Miller Avenue, Cypress Avenue and Tamarack Lane. On-street metered parking is provided on the westside of Airport Boulevard to the north of Grand Avenue. Sidewalks are generally present on both sides of the street, south of Grand Avenue. North of Grand Avenue, a sidewalk is provided only on the west side of the street. Dedicated bicycle lanes are provided in both directions, north of Miller Avenue.

Grand Avenue is a two- to six-lane street that extends from Mission Road to the west to its termination point at Point San Bruno Park in the Genentech campus. West of Airport Boulevard, Grand Avenue has one travel lane in each direction with sidewalks and on-street angled parking on both sides of the street. The posted speed limit on Grand Avenue is 25 MPH in the project vicinity. Grand Avenue provides access to the site via Cypress Avenue and Tamarack Lane.

Miller Avenue is a local street that extends west from Airport Boulevard and terminates at Chestnut Avenue. There are traffic signals at its intersections with Airport Boulevard, Spruce Avenue, and Linden Avenue, but the other intersections are controlled by stop signs. Miller Avenue has one travel lane in each direction, is a designated bike route and has on-street parking and sidewalk on both sides of the street. The posted speed limit on Miller Avenue is 25 MPH in the project vicinity. Miller Avenue provides access to the site via Cypress Avenue and Tamarack Lane.

Linden Avenue is a two-lane local street that extends north from San Mateo Avenue at the city limits and terminates at Airport Boulevard. There are traffic signals at most major intersections with the remainder of its intersections controlled by stop signs. Linden Avenue is a designated bike route with sharrows lane markings for bicycles and has sidewalks and on-street parking on both sides of the street in the project vicinity. The posted speed limit on Linden Avenue is 25 MPH in the project vicinity. Linden Avenue provides access to the site via Tamarack Lane.

Cypress Avenue is a one-way northbound street that extends from Armour Avenue to Baden Avenue. Cypress Avenue is immediately adjacent to the eastern project boundary. Sidewalks and on-street parking are present on both sides of the street. The speed limit on Cypress Avenue is 25 MPH. Cypress Avenue provides access to the site via Tamarack Lane.



Class II Bike Lane on Airport Boulevard

Tamarack Lane is a one-way westbound street that extends from Cypress Avenue and to Orange Avenue. On-street parking is present on one side of the street. The speed limit is 25 MPH. Tamarack Lane is immediately adjacent to the southern project boundary and would provide direct access to the project via two right-in and right-out driveways.

Existing Bicycle Facilities

Bicycle facilities include bike paths, bike lanes, and bike routes. Bike paths (Class I facilities) are pathways, separate from roadways, that are designated for use by bicycles. Often, these pathways also allow pedestrian access. Bike lanes (Class II facilities) are lanes on roadways designated for use by bicycles with special lane markings, pavement legends, and signage. Bike routes (Class III) are existing rights-of-way that accommodate bicycles but are not separate from the existing travel lanes. Routes are typically designated only with signs.

The city has 48.3 miles of existing bikeways, though most of them are not signed (see Figure 2). Transit stations, schools, parks and retail centers are all accessible by these bikeways. The existing and planned bicycle facilities (based on the South San Francisco Bicycle Master Plan, 2011, and DSASP) in the project study area are discussed below.

Class I Bikeway (Multi-Use Path)

- **East Grand Avenue** has a bike path that extends from Industrial Way, crosses over Grand Avenue and ends at Harbor Way. This path connects to Class II bike lanes on East Grand Avenue to the east of Gateway Boulevard and Class II bike lanes on Gateway Boulevard, south of East Grand Avenue.

Class II Bikeway (Bike Lane)

- **Airport Boulevard** has Class II bike lanes in both directions that begin north of Miller Avenue and connect to Class III bicycle routes on Miller Avenue and Linden Avenue.
- **Gateway Boulevard** has Class II bike lanes in both directions that begin south of Grand Avenue and extend to South Airport Boulevard.

- **Grand Avenue** has Class II bike lanes in both directions that begin west of Spruce Avenue and connect to the Class III bicycle route on Spruce Avenue.
- **Railroad Avenue** has a Class II bike lane in the eastbound direction that extends east from Spruce Avenue to Maple Avenue, after which it becomes a Class III bicycle route with sharrows. This lane connects to the Class III bicycle route on Spruce Avenue.

Class III Bikeway (Bike Route)

- **San Mateo Avenue** is a Class III bicycle route without sharrow markings. The route extends from Airport Boulevard past South Linden Avenue, connecting to the Class III bicycle route on Linden Avenue.
- **Linden Avenue** is a Class III bicycle route without sharrow markings. The route extends south from Airport Boulevard to San Mateo Avenue.
- **Spruce Avenue** is a Class III bicycle route with sharrow markings between Grand Avenue and Victory Way. The route connects to Class II bicycle lanes on Grand Avenue.

The City of South San Francisco adopted its citywide Bicycle Master Plan in 2011, the goal of which is to expand the bicycle network to make it easier and safer for people to bicycle through the city. Also, the Downtown Station Area Specific Plan (DSASP) would enhance bicycle operations through new and improved bicycle access at the Grand Avenue/Airport Boulevard intersection. In the project vicinity, bike lanes are planned in both directions on Airport Boulevard between Miller Avenue and San Mateo Avenue. Bike lanes are also planned in both directions on Grand Avenue between Spruce Avenue and Airport Boulevard. As part of the proposed Caltrain Station reconstruction, a new ped/bike rail crossing tunnel is being constructed at the Grand Avenue/Airport Boulevard intersection that would directly connect to the South San Francisco Caltrain station. The new ped/bike tunnel will also provide a good bicycle connection between the downtown and the employment zone to the east of US 101.

Planned US 101/Caltrain Underpass



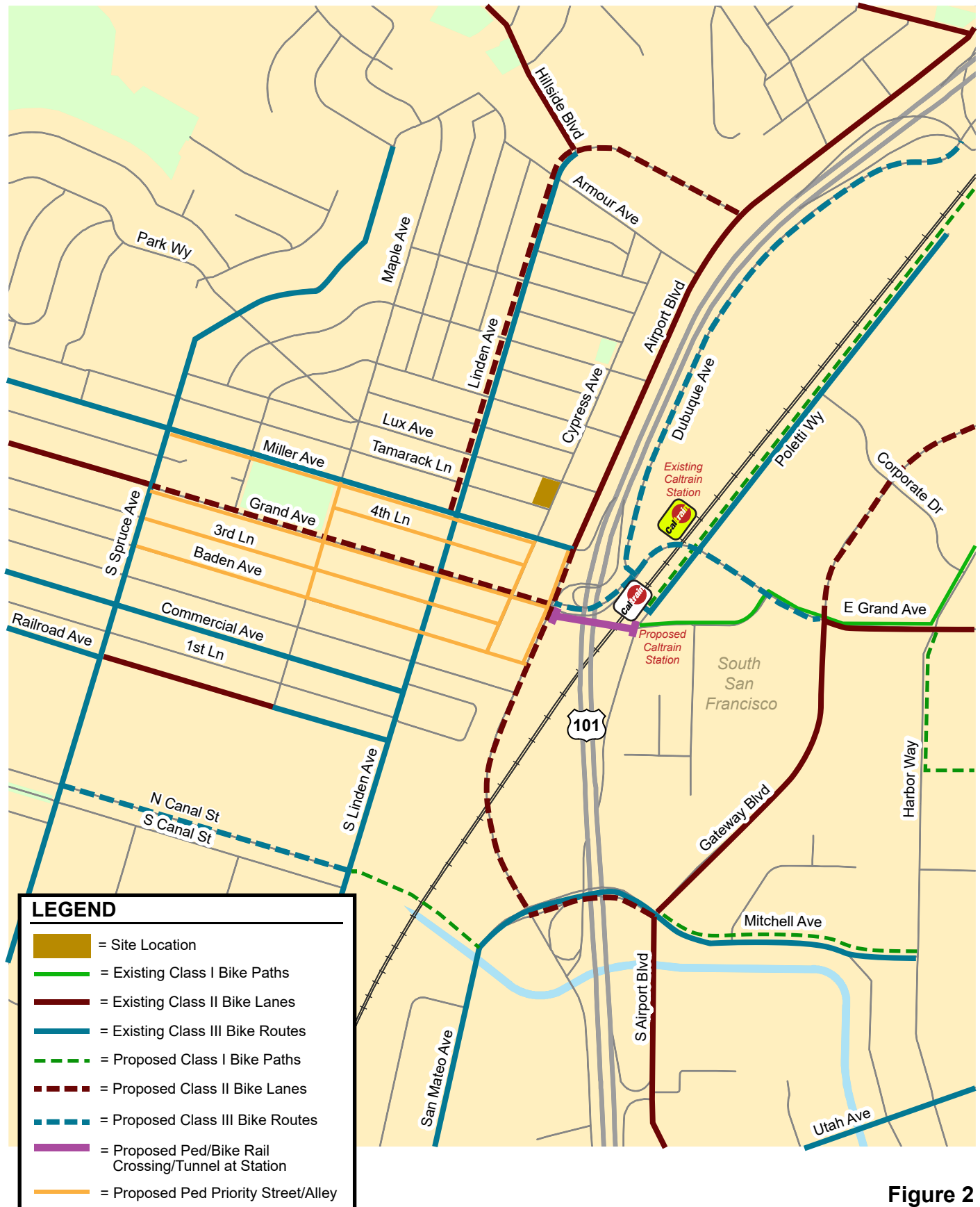


Figure 2
Existing and Proposed Pedestrian and Bicycle Facilities

Existing Pedestrian Facilities

Sidewalks are provided on most streets in the immediate vicinity of the project. Sidewalks exist in both directions on Cypress Avenue, Lux Avenue, Miller Avenue, Grand Avenue and the west side of Airport Boulevard. In the immediate vicinity of the project, crosswalks exist at all four legs of the Miller Avenue/Cypress Avenue, Grand Avenue/Cypress Avenue and Cypress Avenue/Lux Avenue intersections. Crosswalks exist across the west leg of the Airport Boulevard/Miller Avenue intersection and across the west and south legs of the Airport Boulevard/Grand Avenue intersection for pedestrians to access downtown destinations, transit stops, and the Caltrain Station.

As part of the South San Francisco Caltrain Reconstruction Project that is currently in progress, an underpass is being constructed that will provide a direct connection for pedestrians and bicyclists between areas to the west and east of the Caltrain tracks. This underpass will also provide a connection to the new Caltrain station platform.

Overall, the existing network of sidewalks and crosswalks has good connectivity and provides pedestrians with safe routes to transit services and other points of interest in the downtown area.

Transit Services

Existing transit services in the study area include local buses, express buses, shuttles, BART, Caltrain, and ferry service (see Figure 3). A majority of the public transit trips through the area are commuters who use the Caltrain station or connect from BART to Downtown and East of US-101 employers via employer shuttles. Employer sponsored shuttles connect to employment destinations east of the Caltrain station and other commuter connections in the area.

Caltrain

Caltrain provides commuter rail service between San Francisco and Gilroy. The project is located within 0.25 miles of the South San Francisco Caltrain station. The South San Francisco Caltrain Station serves local trains, with 23 northbound and 23 southbound weekday trains. The South San Francisco Caltrain Station provides weekday service from 5:10 AM to 12:35 AM, with 60-minute headways.

Currently, the only access to the South San Francisco Downtown is from the west side of the train tracks, via the Grand Avenue overpass. This overpass requires a long and circuitous detour for people walking and bicycling, who have to cross Grand Avenue and descend either a tall metal staircase or use Dubuque Avenue. The city in partnership with Caltrain is currently working on the South San Francisco Caltrain Station Reconstruction project to improve safety and connectivity to nearby businesses, which is expected to be completed by 2021. The station reconstruction will include widening the center platform and building a pedestrian tunnel to connect the station directly to the west end of Poletti Way. Passengers will be able to get to the east of Caltrain Station from the station's center platform via ramps connecting to a tunnel underneath the tracks. The tunnel will connect to a pedestrian plaza at Grand Avenue and Airport Boulevard on the west side of the tracks and a transit plaza at the



Rendering of the New Widened Central Platform at the South San Francisco

intersection of Grand Avenue and Poletti Way on the east side of the tracks. Buses and shuttles will pick up and drop off Caltrain passengers from the new east-side plaza instead of the parking lot on the west side of the station, which would make it easier for residents commuting to the City's biotech job center on the east side of the tracks.

SamTrans

Existing bus service to the study area is provided by San Mateo County Transit District (SamTrans). Bus services to the study area are described in Table 3.

Table 3
SamTrans Services

Route ¹	Route Description	Weekday Hours of Operation ²	Headways ² (minutes)
Express, SFO and Multi-City Route 397	San Francisco – Palo Alto Transit Center (Limited Overnight Service) - Serves SF Airport	12:45 AM - 6:30 AM	60
Express, SFO and Multi-City Route 292	San Francisco – Hillsdale Mall - Serves SF Airport	3:55 AM - 2:45 AM	10 to 30
North County Route 38	Safe Harbour ³	6:00 AM - 8:05 AM 4:15 PM - 7:00 PM	
North County Route 37	Alta Loma School - Hillside/Grove (School-day only)	8:10 AM - 8:30 AM 2:30 PM - 4:00 PM	
North County Route 130	Daly City BART - Airport/Linden	5:00 AM - 12:00 AM	15
North County Route 141	Airport/Linden – Shelter Creek	6:10 AM - 8:00 PM	30
Notes: Source: SamTrans Service Schedule and Map, September 2021 1. Closest bus stop to bus routes 397 and 292 is located at Airport Boulevard and Grand Avenue (850 feet from the project location) and all others are at Miller Avenue and Linden Avenue (425 feet from the project location). 2. Approximate weekday operation hours and headways during peak periods in the project area, as of August 2020. 3. Route 38 continues as route 130 and route 141 between 6:00 AM to 7:00 AM and 5:30 PM to 6:45 PM.			

SamTrans provides bus service on the west side of US 101. The closest bus stops to the project site are approximately 425 feet to the west at the intersection of Linden Avenue and Miller Avenue and are served by Routes 37, 130 and 141. The bus stops at the intersection of Airport Boulevard and Grand Avenue are located approximately 850 ft to the south of the project and are served by Routes 292 and 397.

BART

Bay Area Rapid Transit (BART) operates regional rail service in the Bay Area, connecting between San Francisco International Airport and the Millbrae Intermodal Station to the south, San Francisco to the north, and cities in the East Bay. The BART stations closest to the project area are the San

Bruno Station, located near Huntington Avenue east of El Camino Real, and the South San Francisco Station, located on Mission Road and McLellan Drive. Both stations are located within 2.5 miles of the project site. BART trains operate on 15-minute headways during peak hours. SamTrans Route 130 provides connection between the project site and the South San Francisco BART station, and SamTrans Route 141 provides connection between the project site and the San Bruno BART station.

Commuter Shuttles

Commuter shuttle service is provided in the East of 101 Area by the Peninsula Traffic Congestion Relief Alliance (Commute.org). The shuttles provide weekday commute period first/last mile connections between BART and the Caltrain stations, the WETA ferry terminal, and local employers in the East of 101 Area.

These shuttles are free for all passengers and are open to the general public. All shuttles are wheelchair-accessible and equipped with a bicycle rack on the front of the vehicle. Service is provided from Monday through Friday during morning and afternoon commute hours. The following shuttle services can be accessed within walking distance of the South San Francisco Caltrain station and the project site (approximately 2,000 feet). As part of the South San Francisco Caltrain Station Reconstruction project, shuttle stops will be relocated from the existing Caltrain station parking lot to a new pedestrian plaza that will be located near the intersection of East Grand Avenue and Poletti Way on the east side of the tracks. Residents of the project will access the new shuttle stops via the new bicycle/pedestrian underpass at the Airport Boulevard/Grand Avenue intersection.

- **The Genesis One Tower Place (OTP) Shuttle** connects the South San Francisco Caltrain and South San Francisco BART stations and provides service to the Genesis Towers (a bio tech hub located on the west side of Airport Boulevard approximately 1,000 feet north of Sister Cities Boulevard) and the Dubuque Innovation Center in South San Francisco. This line provides service during peak commute hours, between 6:50 AM and 10:10 AM, and between 4:00 PM and 6:35 PM with 60-minute headways during the AM peak hour and 30-to-60-minute headways during the PM peak hour.
- **The Oyster Point Caltrain shuttle (OPC)** operates from the South San Francisco Caltrain Station and provides service to offices and businesses along Oyster Point Boulevard. This line provides service during peak commute hours, between 6:30 AM and 9:45 AM, and between 2:50 PM and 6:15 PM with 20 to 40-minute headways during the AM peak and the PM peak hour.
- **The Utah-Grand Caltrain shuttle (UGC)** operates from the South San Francisco Caltrain Station and provides service to businesses along E. Grand Avenue on the east side of Highway 101 in South San Francisco. This line provides service during peak commute hours, between 6:30 AM and 9:45 AM, and between 2:45 PM and 6:10 PM with 20-to-40-minute headways.
- **The Oyster Point Ferry shuttle (OPF)** connects riders from the South San Francisco Ferry Terminal to the South San Francisco Caltrain station and provides service to Oyster Point Boulevard, Genesis Towers, and the Dubuque Innovation Center. This line provides service during peak commute hours, between 6:50 AM and 9:30 AM, and between 2:45 PM and 5:20 PM with 60-minute headways.

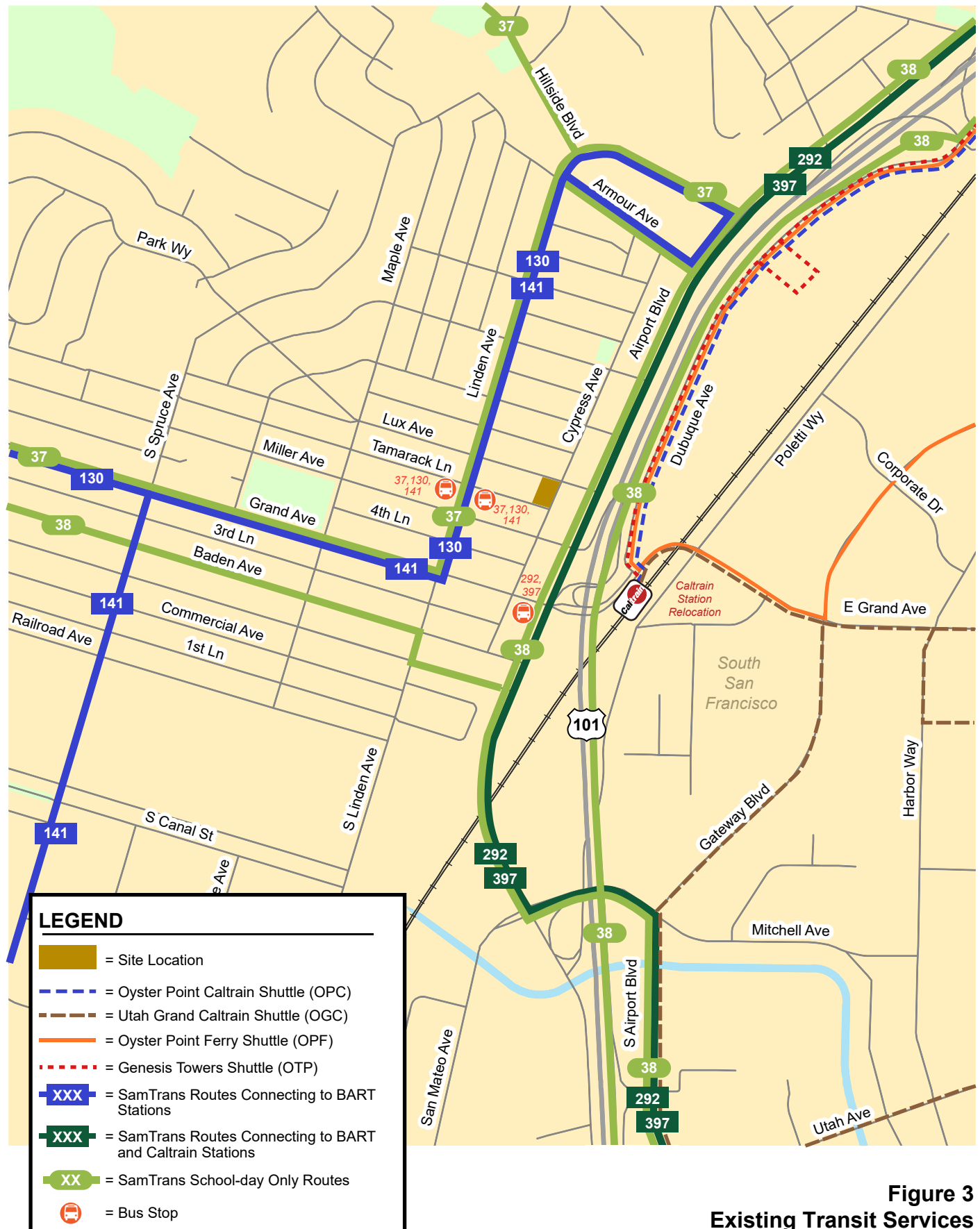


Figure 3
Existing Transit Services

Existing Intersection Operations

This section describes existing traffic operations based on existing lane configurations at study intersections and existing weekday AM (7:00 AM – 9:00 AM) and PM (4:00 PM – 6:00 PM) peak hour traffic volumes. Since traffic conditions have not returned to pre-pandemic levels, the existing conditions analysis was based on traffic volumes that occurred prior to the COVID-19 pandemic. AM and PM peak hour volumes at intersections 3, 4 and 5 were based on historical counts from September and November 2019. No historical counts were available at intersections 1 and 2. New AM and PM peak hour counts were conducted in November 2021 at all 5 study intersections and 2021 counts at intersections 1 and 2 were adjusted to reflect pre-pandemic traffic levels by applying a growth factor of 1.143 during the AM peak hour and 1.134 during the PM peak hour. The growth factor was based on comparing 2019 and 2021 AM and PM peak hour volumes at intersections 3, 4 and 5. The existing lane configurations at the study intersections are shown on Figure 4 and the existing traffic volumes are shown on Figure 5. Intersection turning movement counts are included in Appendix A.

The results of the intersection level of service analysis under existing conditions are summarized in Table 4. The results of the analysis show that all five study intersections currently operate at an acceptable LOS D or better during both the AM and PM peak hours.

Table 4
Existing Conditions Intersection LOS Analysis

#	Intersection	Control	Peak Hour	Count Date	Existing Conditions	
					Avg. Delay (sec)	LOS
1	Miller Avenue & Linden Avenue	Signal	AM	11/09/21	32.3	C
			PM	11/09/21	46.8	D
2	Miller Avenue & Cypress Avenue	One-Way Stop	AM	11/09/21	9.9	A
			PM	11/09/21	11.9	B
3	Miller Avenue & Airport Boulevard	Signal	AM	09/24/19	28.2	C
			PM	09/24/19	20.0	C
4	Linden Avenue & Grand Avenue	Signal	AM	11/05/19	12.1	B
			PM	11/05/19	11.4	B
5	Airport Boulevard & Grand Avenue	Signal	AM	09/24/19	36.8	D
			PM	09/24/19	47.5	D

Note:
Delay reported as seconds per vehicle. At signalized intersections, the delay shown is the weighted average delay for all movements. For the one-way stop controlled intersection, the delay of the stop controlled approach is reported. LOS based on the methodology in Highway Capacity Manual (HCM). Intersections 1 and 2 are based on HCM 6th Edition methodology. The remaining intersections are based on HCM 2000 methodology.

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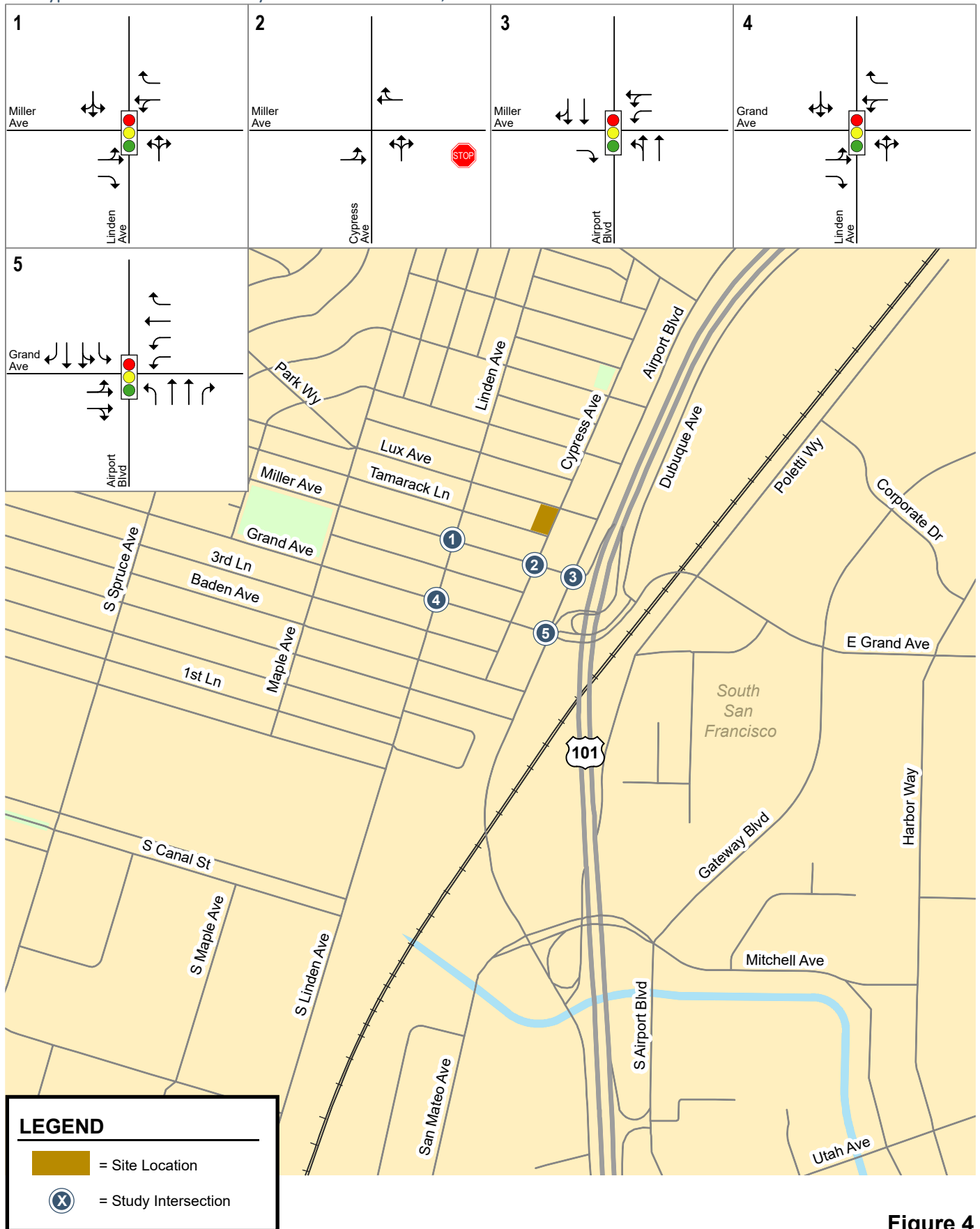


Figure 4
Existing Lane Configurations

421 Cypress Avenue Traffic Study – South San Francisco, CA

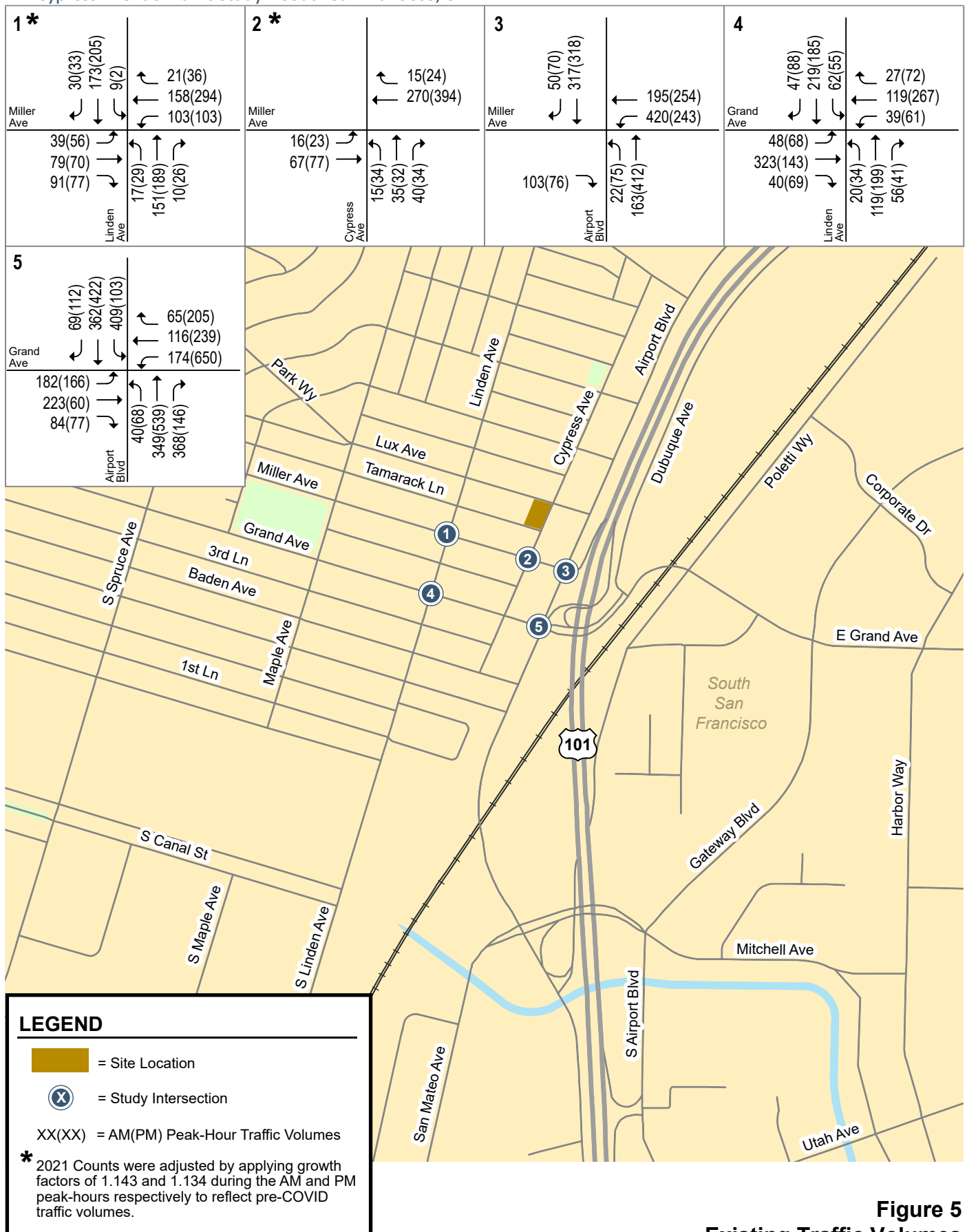


Figure 5
Existing Traffic Volumes

Project Trip Estimates

The magnitude of traffic produced by a new development and the locations where that traffic would appear are estimated using a three-step process: (1) trip generation, (2) trip distribution, and (3) trip assignment. In determining project trip generation, the magnitude of traffic entering and exiting the site is estimated for the AM and PM peak hours. As part of the project trip distribution, an estimate is made of the directions to and from which the project trips would travel. In the project trip assignment, the project trips are assigned to specific streets. These procedures are described further in the following sections.

Project Trip Generation

Through empirical research, data have been collected that quantify the amount of traffic produced by many types of land uses. The research is compiled in the manual entitled *Trip Generation, 11th Edition*, published by the Institute of Transportation Engineers' (ITE). The magnitude of traffic added to the roadway system by a particular development is estimated by multiplying the applicable trip generation rates by the size of the development. The proposed project would replace the existing 10,000 square-foot restaurant with 99 dwelling units and 1,500 s.f. of restaurant space. To reflect a conservative analysis, no trip credit was taken for existing uses on the site, and traffic from the project was estimated based on only the residential use (see Table 5) as traffic that would be generated by the proposed 1,500 s.f. restaurant would be less than the traffic generated by the existing Bertolucci's restaurant. The ITE trip generation rates for Multifamily Housing (Mid-Rise) (Land Use 221) located close to Rail Transit was used for this study. Based on the ITE trip generation manual, mid-rise multifamily housing includes apartments and condominiums located in a building that has between four and 10 floors of living space. Access to individual dwelling units is through an outside building entrance, a lobby, elevator, and a set of hallways. A site is considered close to rail transit if the walking distance between the residential site entrance and the closest rail transit station entrance is ½ mile or less.

As shown in Table 5, the project is estimated to generate 470 daily vehicle trips, with 32 trips occurring during the AM peak hour and 29 trips during the PM peak hour.

Table 5
Project Trip Generation

Land Use	ITE Code	Size	Daily		AM Peak Hour				PM Peak Hour			
			Rate	Trips	Rate	In	Out	Total	Rate	In	Out	Total
Proposed Land Use												
Multifamily Housing (Mid-Rise)	221	99 d.u.	4.75	470	0.32	18	14	32	0.29	12	17	29
<u>Notes:</u> d.u. = Dwelling Unit All rates are from Institute of Transportation Engineers, <i>Trip Generation Manual, 11th Edition, 2021</i> . Average rates are used General Urban/Suburban Multifamily Housing (Mid-Rise) located close to Rail Transit.												

Trip Distribution Pattern and Trip Assignment

The trip distribution pattern for the project was estimated consistent with the trip distribution assumptions presented in the DSASP EIR for the West area (west of US 101) and shown on Figure 6. These distribution estimates were developed based on the location of complementary land uses, existing travel patterns in the area, and the Metropolitan Transportation Commission (MTC) regional travel demand model. The project trips assigned to the study intersections are shown on Figure 7.

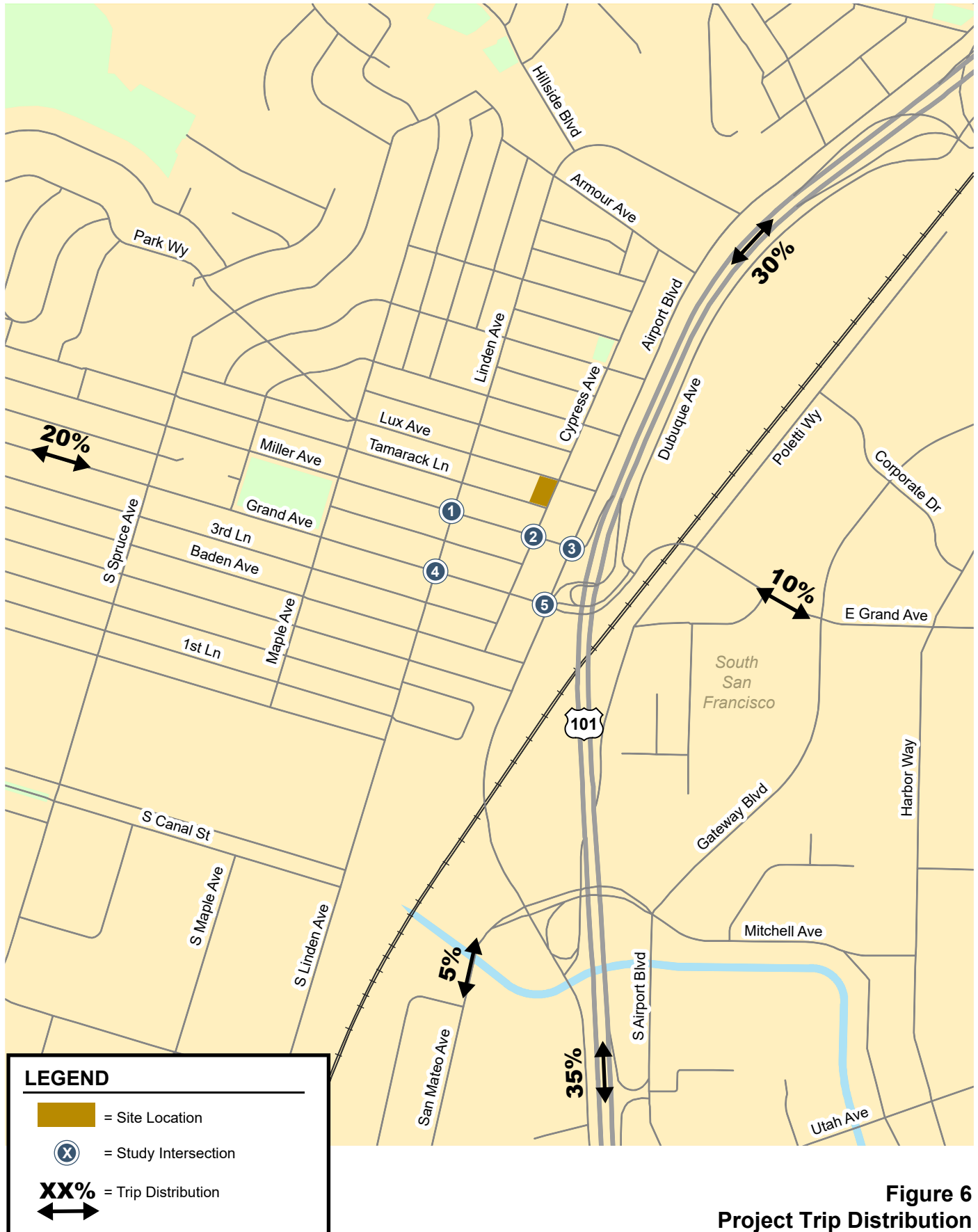
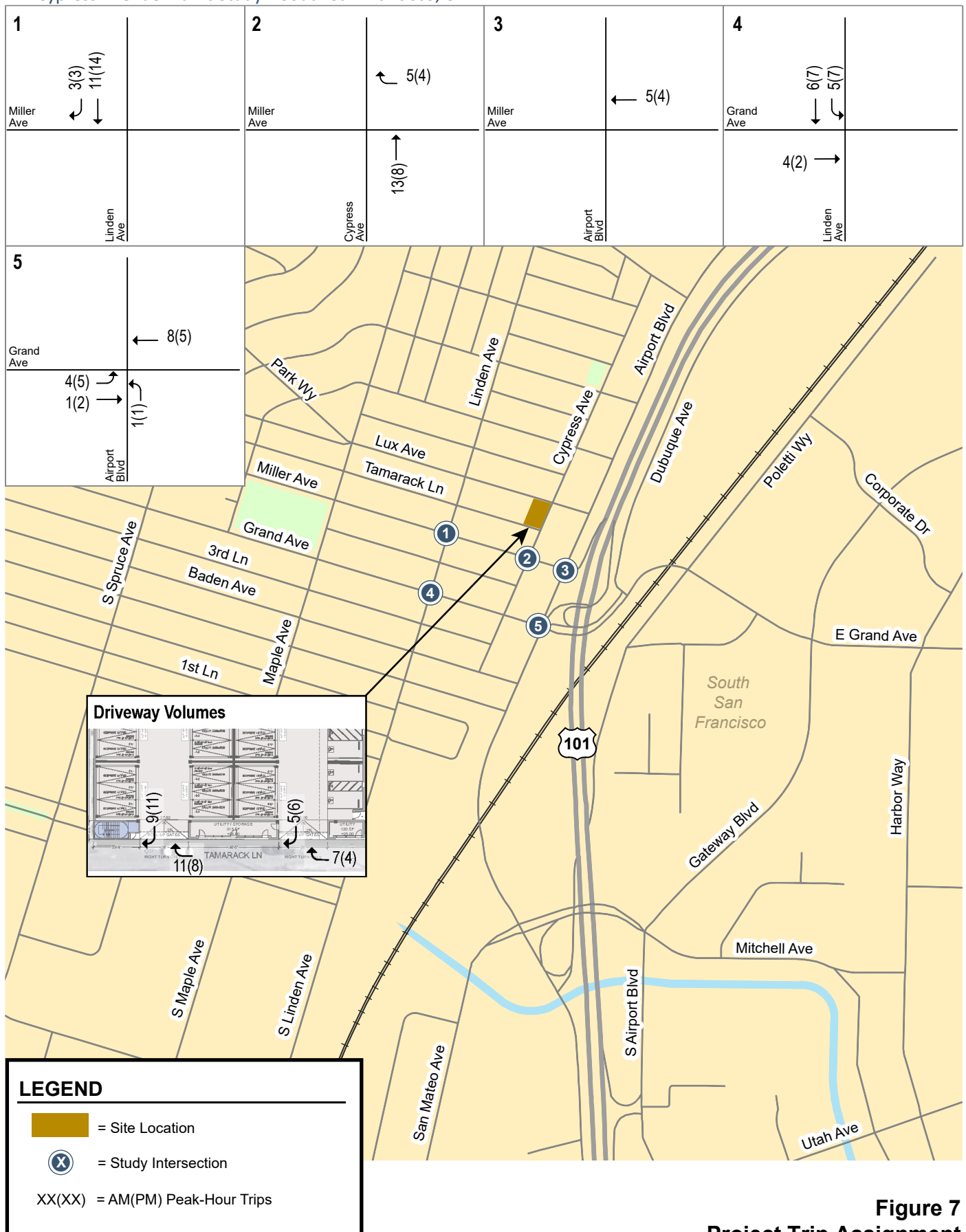


Figure 6
Project Trip Distribution

421 Cypress Avenue Traffic Study – South San Francisco, CA



Background and Project Condition Transportation Network

Under background and project conditions, it is assumed that the roadway network would be the same as analyzed under existing conditions.

Background and Background Plus Project Conditions

Traffic volumes for background conditions were developed by adding trips from approved projects in the vicinity of the proposed project to the existing traffic volumes. Based on consultation with City staff, the projects shown in Table 6 were identified as approved/pending projects for consideration under background conditions.

As shown in Table 6, the five near-term projects are expected to generate a total of 269 trips during the AM peak hour and 344 trips during the PM peak hour. These trips were added to existing traffic volumes to obtain traffic volumes for analysis under background conditions. Trips from approved projects were assigned to the study intersections based on the trip distribution assumptions developed for the West area in the DSASP EIR.

Table 6
Approved Project Trips

Land Use	Quantity	LandUse	Daily Trips	AM Trips			PM Trips		
				In	Out	Total	In	Out	Total
418 / 488 Linden ¹	38	Residential units	278	4	14	18	14	8	22
Sares Regis/Cadence Phase 2 ²	195	Residential units	1,305	20	80	100	82	43	125
255 Cypress Ave /201 -219 Grand Avenue ³	46	Residential units	337	5	17	22	16	10	26
	6.0	Retail K.S.F	227	4	2	6	0	1	1
200 Airport Boulevard ⁴	200	Residential units	678	9	33	42	41	25	66
	3.7	Retail K.S.F							
150 Airport Boulevard ⁵	157	Residential units	1,075	16	65	81	68	36	104
Total				58	211	269	222	122	344

Notes:

¹ Trip generation based on average rates for Land Use 220 - 'Apartment' from the Institute of Transportation Engineers (ITE) *Trip Generation Manual* (10th Edition).

² Trip generation based on Traffic Study for the Miller/Cypress Residential Project prepared by Hexagon Transportation Consultants in October 2015.

³ Trip generation based on average rates for Land Use 220 - 'Apartment' and Land Use 820 - 'Shopping Center' from the Institute of Transportation Engineers (ITE) *Trip Generation Manual* (10th Edition).

⁴ Trip generation based on Trip Generation Analysis for the 200 Airport Boulevard project, prepared by Hexagon Transportation Consultants in May 2019.

⁵ Trip generation based on Traffic Impact Analysis for the 150 Airport Boulevard project, prepared by Hexagon Transportation Consultants in October 2017.

Traffic volumes under background conditions are shown on Figure 8. Background plus project traffic volumes were developed by adding project trips to background volumes. Background plus project traffic volumes are shown on Figure 9.

As shown in Table 7, all study intersections would continue to operate at acceptable LOS D or better during the AM and PM peak hours under background conditions and would continue to operate at acceptable conditions with the proposed project. At the intersection of Miller Avenue and Linden Avenue, the delay during the PM peak hour under background plus project conditions is shown to be slightly better than that of background conditions. This occurs because the intersection delay is a weighted average of all intersection movements. The addition of project traffic to movements with delays lower than the average intersection delay (such as right turns) can reduce the average delay for the entire intersection. Detailed level of service calculation sheets are included in Appendix B.

Table 7
Background and Background Plus Project Intersection Operations

#	Intersection	Control	Peak Hour	Count Date	Background							
					No Project		with Project					
					Avg. Delay (sec)	LOS	Avg. Delay (sec)	LOS	Delay Increase (sec)	Project Trips	Background + Project Trips	% Increase in Volume
1	Miller Avenue & Linden Avenue	Signal	AM	11/9/21	32.6	C	32.6	C	0.0	14	977	1.4%
			PM	11/9/21	47.9	D	47.6	D	-0.3	17	1196	1.4%
2	Miller Avenue & Cypress Avenue	One-Way Stop	AM	11/9/21	10.1	B	10.2	B	0.1	18	514	3.5%
			PM	11/9/21	12.6	B	12.8	B	0.2	12	720	1.7%
3	Miller Avenue & Airport Boulevard	Signal	AM	9/24/19	28.6	C	28.6	C	0.0	5	1323	0.4%
			PM	9/24/19	20.3	C	20.3	C	0.0	4	1571	0.3%
4	Linden Avenue & Grand Avenue	Signal	AM	11/5/19	13.3	B	13.5	B	0.2	15	1246	1.2%
			PM	11/5/19	12.3	B	12.6	B	0.3	0	1409	0.0%
5	Airport Boulevard & Grand Avenue	Signal	AM	9/24/19	38.3	D	38.7	D	0.4	14	2608	0.5%
			PM	9/24/19	50.4	D	50.8	D	0.4	5	2992	0.2%

Note:
Delay reported as seconds per vehicle. At signalized intersections, the delay shown is the weighted average delay for all movements. For the one-way stop controlled intersection, the delay of the stop controlled approach is reported. LOS based on the methodology in Highway Capacity Manual (HCM). Intersections 1 and 2 are based on HCM 6th Edition methodology. The remaining intersections are based on HCM 2000 methodology.

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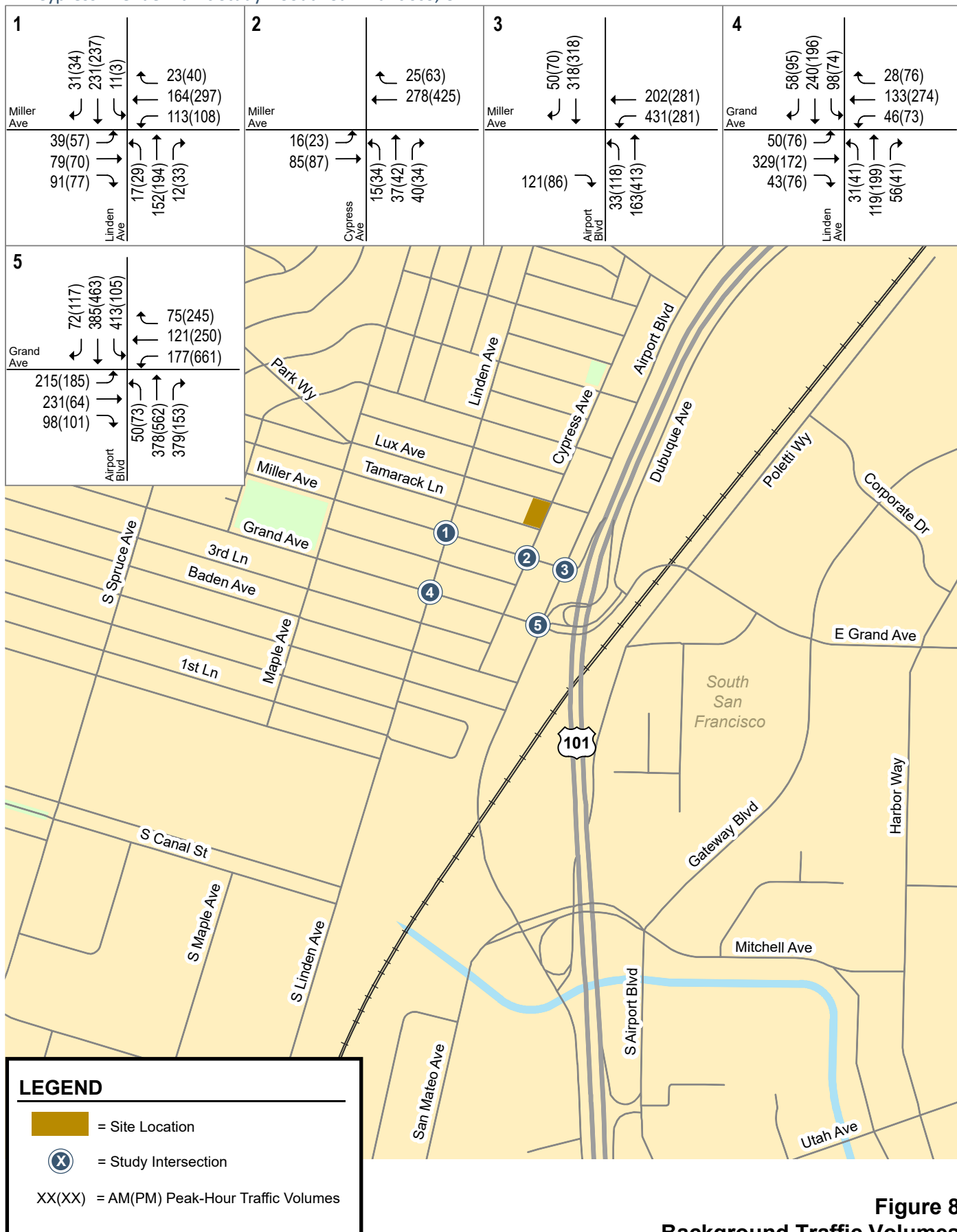


Figure 8
Background Traffic Volumes

421 Cypress Avenue Traffic Study – South San Francisco, CA

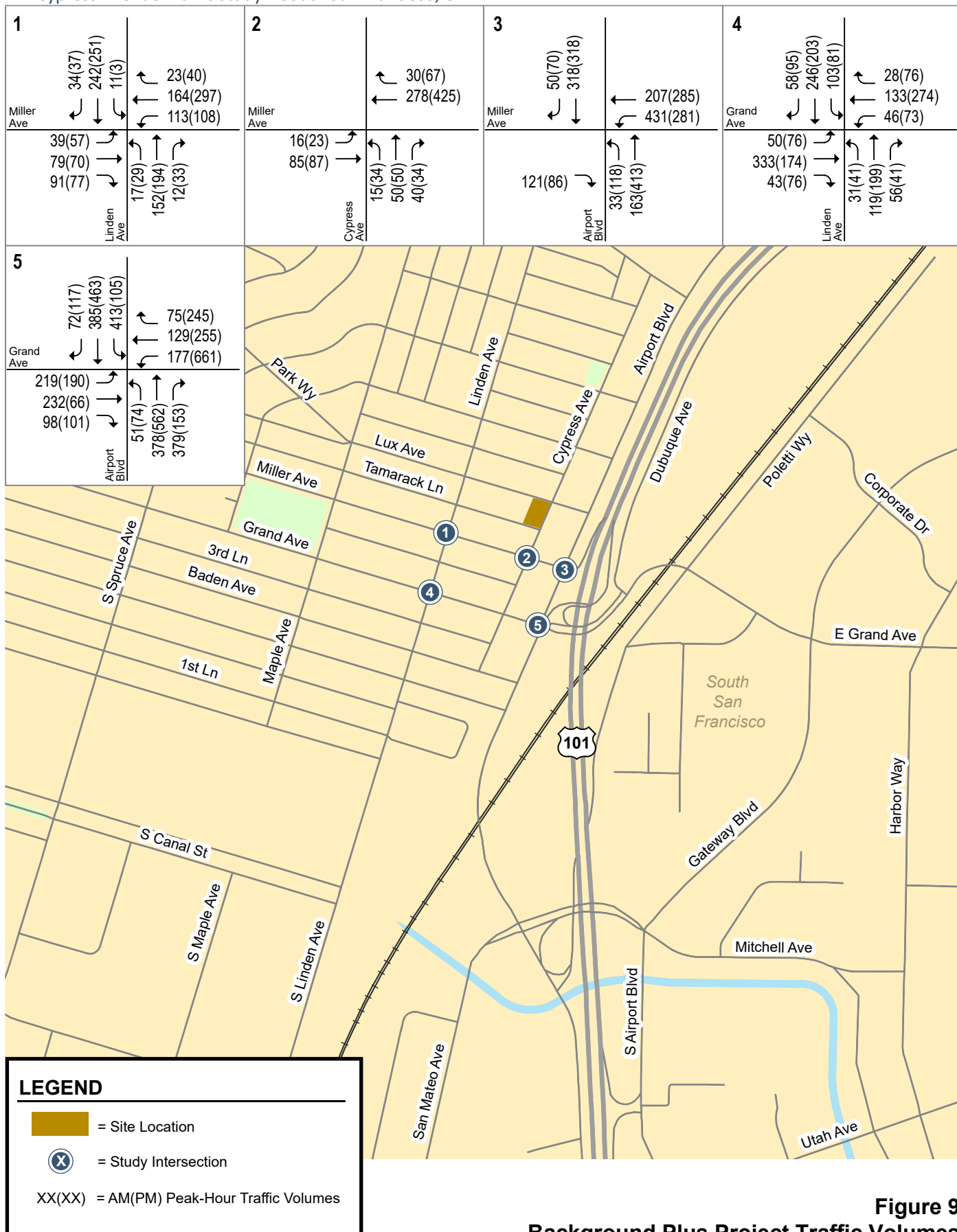


Figure 9
Background Plus Project Traffic Volumes

Site Access and On-Site Circulation

The site access and on-site circulation evaluation is based on the August 6, 2021, site plans prepared by Studio T Square. Access to the project would be provided by two driveways along Tamarack Lane (see Figure 10). Level 1 would comprise the restaurant, parking garage, utility room, trash room, flexible space, mail package room, leasing and lobby area. Mechanical stacker vehicular parking would be provided within level 1 and a mezzanine floor. In addition to the mechanical parking pit, a bike room and a storage room would be located on the mezzanine floor. Access to this floor would be provided by two elevators and a staircase (see Figure 11). Vehicular access to the parking garage would be provided on Tamarack Lane. The restaurant area would be located at the corner of Lux Avenue and Cypress Avenue, and pedestrian access to the project will be provided on Lux Avenue and Cypress Avenue. The site plans show that the project would provide a total of 99 residential units and 1,500 square feet of restaurant space.

Site Access

The site plans show that vehicular access to the project would be provided at the back of the building via two access gates on Tamarack Lane, which is a one-way alley that runs parallel to Lux Avenue. Tamarack Lane is approximately 20 feet wide, and street parking is allowed on the north side only. The gates will typically be open during the day and closed at night. Cars waiting for the gates has a potential to block the alley. However, this is not a problem because it would occur infrequently at night. Because Tamarack Lane is a one-way alley in the westbound direction, the only allowable turning movements are right turn in and right turn out at the garage access points. The site plan shows that the two parking gates would measure approximately 25 feet wide, which would be adequate for vehicles to enter and exit the parking garage. The east side gate would provide access to 30 mechanical stacker vehicular parking spaces and seven standard parking spaces, including five accessible parking spaces. The west side gate would provide access to 60 mechanical stacker vehicular parking spaces and two standard parking spaces. The two parking aisles within the garage would not be connected.

Recommendation 1: It is recommended that the parking spaces be assigned to individual residential units.

The number of AM and PM peak hour vehicular trips entering and exiting the project at Tamarack Lane is shown on Figure 7. With these relatively low vehicular volumes, no significant traffic operational issues are anticipated at the site access points.

On-Site Circulation

On-site vehicular circulation was reviewed in accordance with the City of South San Francisco Zoning Ordinance and generally accepted traffic engineering standards.

The parking garage would contain 90-degree parking. Upon entering the parking area, vehicles would turn left or right into one of the two parking stacker system modules or accessible parking spaces or standard parking spaces. The parking stacker system would increase the capacity of onsite parking by mechanically stacking the parked vehicles vertically and would allow independent access to vehicles on the lift so they could be shared by different residents. The City's standard width for two-way drive aisles is 25 feet where 90-degree parking is provided. The site plan shows that the drive aisle in the parking garage measures 25 feet which meets the City's standard.

The project site plan parking space dimensions should be reviewed.

Recommendation 2: Prior to final design, the dimensions of the stacker parking system should be reviewed by Public Works City staff. The parking stackers should have at least 7 feet of vertical clearance to allow usage by large passenger vehicles. The minimum basic

dimension for standard parking spaces should be 8.5 feet by 18 feet, where 90-degree parking is provided.

Truck Access

Garbage truck access would occur via Cypress Avenue. The site plan shows that a trash enclosure would be located on level 1 on the southeast corner of the building. The maintenance staff would roll out the garbage bins during garbage collection times so that garbage truck access could occur along Cypress Avenue. The site plan does not show any on-site loading zones for moving/delivery trucks. The project should provide a designated area along the project frontage on Cypress Avenue or Lux Avenue for moving/delivery trucks that could also be used for passenger loading. Fire and emergency access to the project would occur via the streets fronting the project.

Recommendation 3: It is recommended that a loading zone be designated on Cypress Avenue or Lux Avenue along the project frontage for moving/delivery trucks and passenger loading.

Sight Distance

Sight distance at the project access gates was checked. The east gate would be located approximately 50 feet from the intersection of Cypress Avenue/Tamarack Lane, and the west gate would be located approximately 45 feet to the west of the east gate. Vehicles exiting the garage would be able to see traffic turning onto Tamarack Lane from Cypress Avenue. Vehicles exiting the garage would not have difficulty turning onto Tamarack Lane as they would need gaps in only one direction.

Recommendation 4: On-street parking along the project frontage on Tamarack Lane should not be permitted in order to provide adequate sight distance for vehicles exiting the parking garage.

Pedestrian access to the project site would be provided by the existing sidewalks on Cypress Avenue and Lux Avenue.

Parking

Calculation of Vehicular Parking Requirement

The proposed project is located within the downtown area. Parking requirements are included in the City of South Francisco Parking Ordinance (20.330.007- Downtown Parking) as discussed below.

Multi-family Residential

- Studio and less than 500 sq ft – 1 space per unit maximum.
- One-bedroom or 500 to 800 sq ft - 1 space minimum, 1.5 spaces maximum per unit.
- Two-bedroom or 801 to 1,100 sq ft - 1.5 spaces minimum, 1.8 spaces maximum per unit.
- Three or more bedrooms and 1,101 sq ft or larger – 1.5 spaces minimum, 2 spaces maximum per unit.

Restaurants

- No parking required for the first 1,500 s.f. of customer seating area or floor area and 1 space per 100 s.f. of customer seating area in excess of 1,500 s.f.

Based on these requirements, the project would be required to provide 112 parking spaces for the residential use and zero parking spaces for the restaurant use. According to the site plan, the project would provide a total of 99 parking spaces for residential use, which is 13 spaces (approximately 12%) fewer than the number of vehicular spaces required by the code. However, given the project's location and its proximity to the Caltrain station, it is expected that many

residents would use public transportation and would not need a car. Also, the project would implement a comprehensive TDM plan, in accordance with South San Francisco requirements, to reduce the project's parking demand and offset the reduced on-site parking.

Per the California Building Code (CBC) Table 11B-6, based on the parking provision of 99 parking spaces, the project would need to dedicate four of those parking spaces as accessible stalls including one van accessible space. The project site plan shows a total of five accessible parking spaces including one electric vehicle accessible parking space and two van accessible spaces. Therefore, the project would meet the parking requirements of the American Disability Act (ADA).

The site plan shows approximately 15 on-street parking spaces along the project frontages on Cypress Avenue and Lux Avenue which could be utilized by employees and diners of the restaurant and residential guests.

Calculation of Bicycle Parking Spaces

According to the City's bicycle parking standards, for multi-unit residential developments with eight or more units, short-term bicycle parking should be provided at a rate of 10% of the number of required automobile parking spaces. The code also requires that long-term bicycle parking be provided at a minimum of one bicycle parking space for every four units for multi-unit residential projects. This calculates to 11 short-term bicycle parking spaces and 25 long-term bicycle parking spaces.

The site plan shows that short-term bicycle parking would be provided along the project frontages on Cypress Avenue and Lux Avenue: three bicycle racks that can accommodate 6 bicycles would be provided along Cypress Avenue, and two bicycle racks that can accommodate 4 bicycles would be located along Lux Avenue. The site plan also shows a bicycle storage room in the parking garage that can accommodate 26 bicycles. Thus, adequate short-term and long-term bicycle parking would be provided on site.

Transit, Pedestrian and Bicycle Impacts

The project is well situated to take advantage of the existing and planned pedestrian, bicycle, and transit services in the immediate vicinity. These services would allow project residents to access employment and many services without a car. The new Caltrain station connections will allow easy access to transit services and will also provide a good bicycle connection to the employment zone to the east. Pedestrians can access the project site to/from other parts of the downtown via existing sidewalks and crosswalks at signalized intersections.

The proposed project would generate pedestrian trips to and from transit stops and commercial areas in the project vicinity. As described previously, all of the streets in the project vicinity have sidewalks and crosswalks at intersections. Overall, the volume of pedestrian trips generated by the project is not expected to exceed the carrying capacity of the sidewalks and crosswalks in the vicinity of the site and the existing pedestrian and bicycle facilities provide adequate access to the project site.

The development of the project would not remove any existing bicycle/pedestrian facilities, nor would it preclude any future planned improvements. The addition of project traffic would have a negligible effect on walking and bicycling in the project vicinity. Therefore, the proposed project would not create an adverse impact to bicycle/pedestrian circulation in the area.

Existing transit service in the project vicinity is provided by Caltrain, SamTrans, and the commute.org shuttles. According to the U.S. Census data for South San Francisco, approximately 15 percent of the proposed project's commuters could be expected to use transit to and from the project site. For the proposed project, this would equate to a maximum of 30 new transit trips (99

dwelling units x 2 commuters per unit x 0.15) during the AM and PM peak hours, respectively. This volume of riders that could be generated by the project is not likely to exceed the carrying capacity of the existing transit services near the project site.

Conclusions

The project site is located within half mile of the South San Francisco Caltrain Station and the high-quality transit service provided by SamTrans route 130. The project is proposing an FAR of 4.70, fewer than the required number of parking spaces, is consistent with the Downtown Station Area Specific Plan (DSASP) and would provide 15% below market rate (BMR) units. Therefore, the project is expected to result in a less-than-significant VMT impact.

The potential impacts of the project were evaluated in the context of the Downtown Station Area Specific Plan (DSASP) EIR. The traffic generated by the project was found to be consistent with the EIR. The study included the analysis of AM and PM peak hour traffic operations for five intersections, four of which were analyzed in the DSASP EIR. The project would not trigger any of the mitigations that were identified in the DSASP EIR. Site access and on-site circulation were also evaluated based on the site plan dated August 06, 2021 site plans prepared by Studio T Square.

The potential adverse effects of the proposed project were evaluated in accordance with the procedures and guidelines specified by the City of South San Francisco. The analysis resulted in the following key findings:

- All study intersections operate at LOS D or better under existing, background, and background plus project conditions. The proposed project would not result in any adverse effects to the study intersections.
- The project would not create any impacts on pedestrian, bike, or transit facilities.

The analysis also produced the following recommendations:

1. The parking spaces should be assigned to individual residential units since the two parking aisles within the garage are not connected.
2. The parking stackers should have at least 7 feet of vertical clearance to allow usage by large passenger vehicles. The minimum basic dimension for standard parking spaces should be 8.5 feet by 18 feet, where 90-degree parking is provided.
3. It is recommended that a loading zone be designated on Cypress Avenue or Lux Avenue along the project frontage for moving/delivery trucks and passenger loading.
4. On-street parking along the project frontage on Tamarack Lane should not be permitted in order to provide adequate sight distance for vehicles exiting the parking garage.



Figure 10
Site Plan (Level 1)

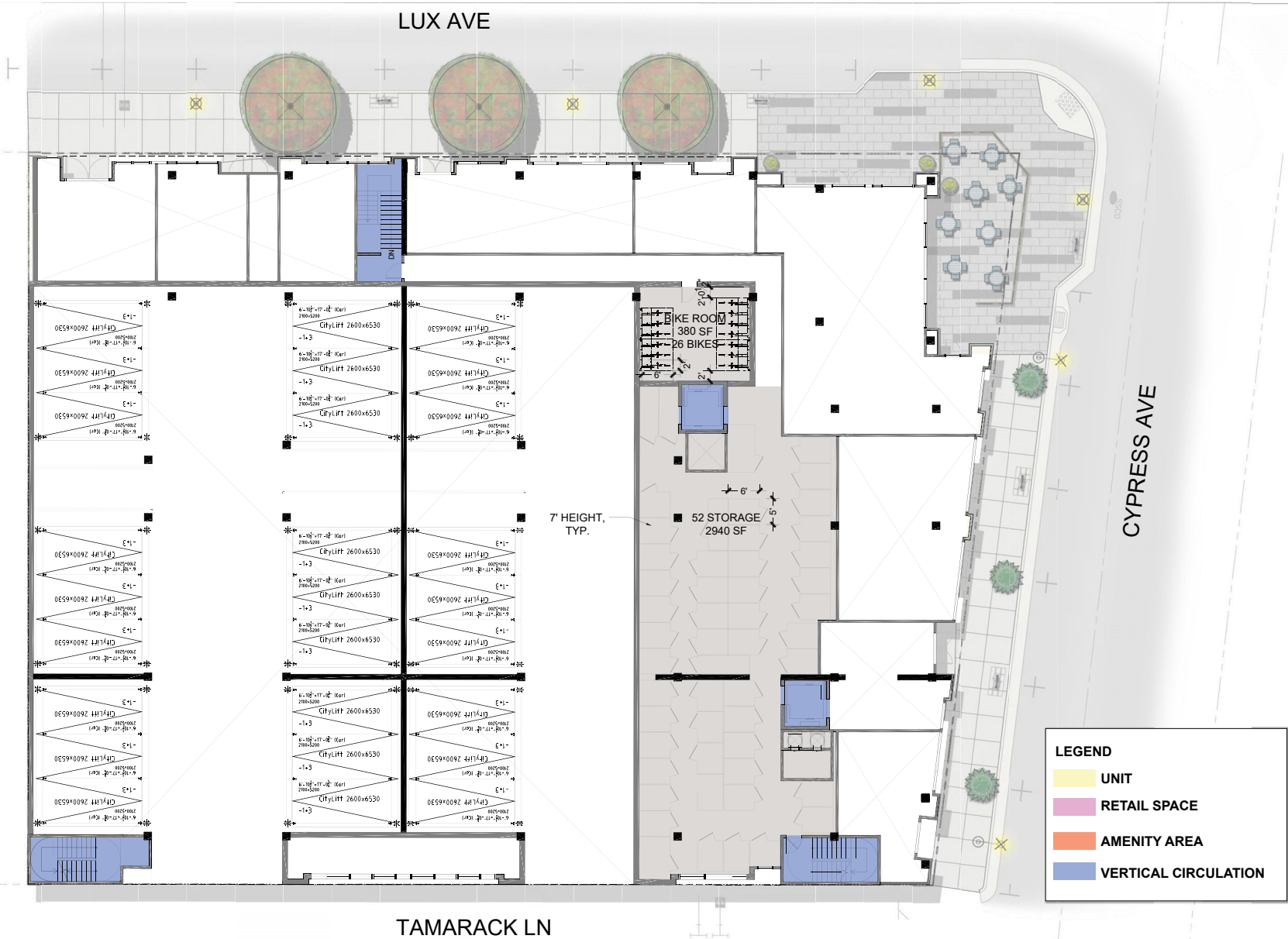


Figure 11
Site Plan (Level 1.5)

**421 Cypress Avenue Mixed-Use Development
Transportation Analysis Appendix**

Appendix A
Intersection Traffic Counts

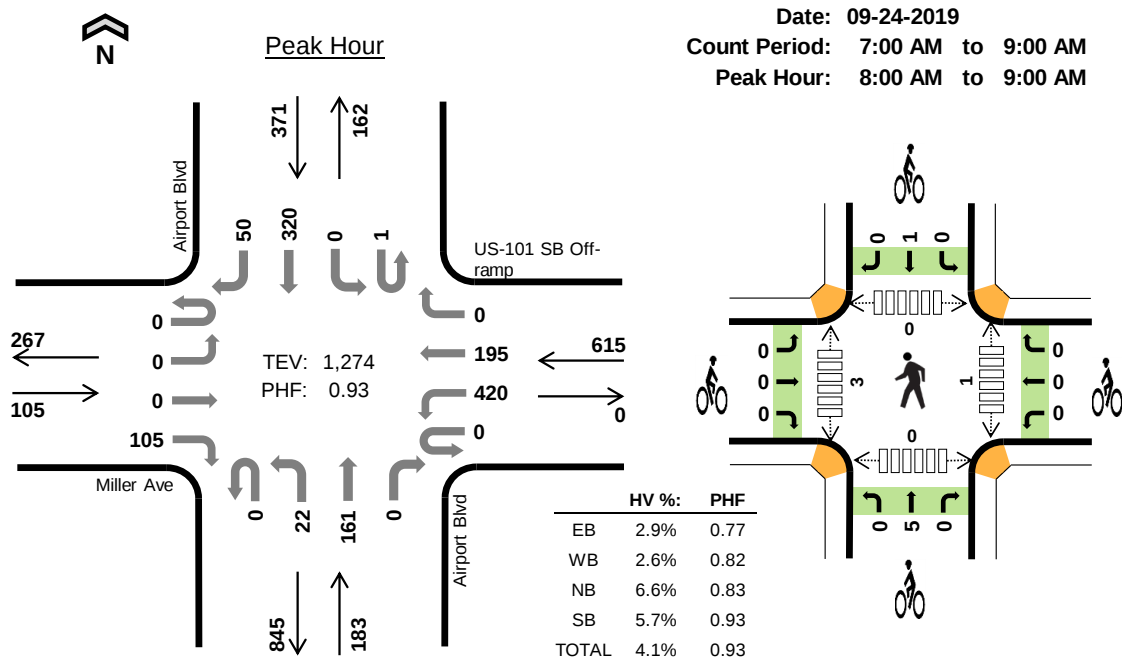
Airport Blvd Miller Ave



Date: 09-24-2019

Count Period: 7:00 AM to 9:00 AM

Peak Hour: 8:00 AM to 9:00 AM



Two-Hour Count Summaries

Interval Start		Miller Ave				US-101 SB Off-ramp				Airport Blvd				Airport Blvd				15-min Total	Rolling One Hour
		Eastbound				Westbound				Northbound				Southbound					
		UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM		0	0	0	8	0	69	28	0	0	4	31	0	0	0	66	8	214	0
7:15 AM		0	0	0	11	0	76	35	1	0	3	32	0	0	0	93	8	259	0
7:30 AM		0	0	0	25	0	84	36	0	0	9	29	0	0	0	93	10	286	0
7:45 AM		0	0	0	21	0	81	49	0	0	6	45	0	0	0	98	19	319	1,078
8:00 AM		0	0	0	21	0	85	54	0	0	7	42	0	1	0	86	6	302	1,166
8:15 AM		0	0	0	26	0	104	50	0	0	3	44	0	0	0	71	16	314	1,221
8:30 AM		0	0	0	34	0	93	41	0	0	7	48	0	0	0	80	11	314	1,249
8:45 AM		0	0	0	24	0	138	50	0	0	5	27	0	0	0	83	17	344	1,274
Count Total		0	0	0	170	0	730	343	1	0	44	298	0	1	0	670	95	2,352	0
Peak Hour	All	0	0	0	105	0	420	195	0	0	22	161	0	1	0	320	50	1,274	0
	HV	0	0	0	3	0	12	4	0	0	0	12	0	0	0	21	0	52	0
	HV%	-	-	-	3%	-	3%	2%	-	-	0%	7%	-	0%	-	7%	0%	4%	0

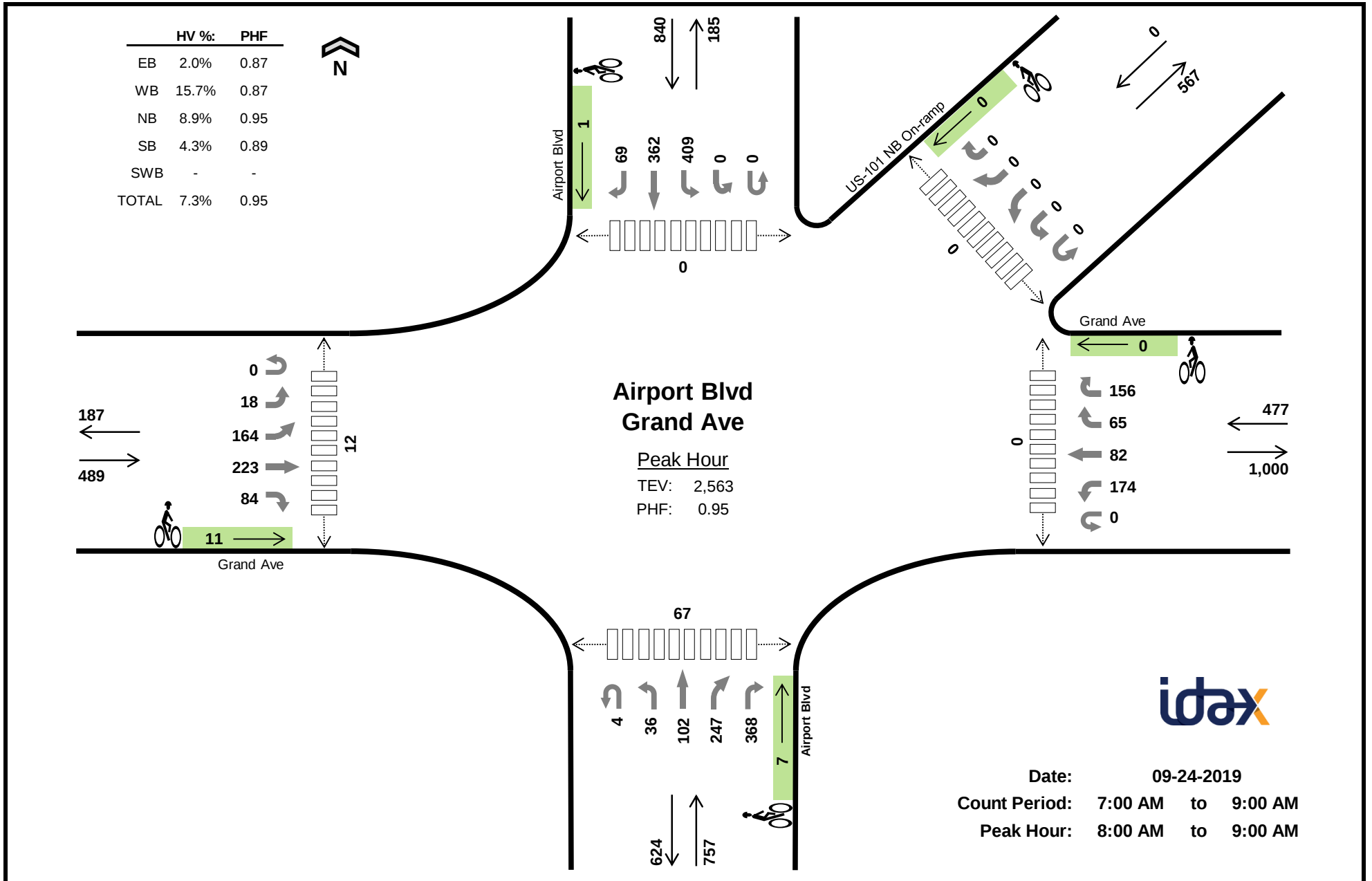
Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
7:00 AM	0	3	4	5	12	0	0	0	0	0	0	1	0	0	1
7:15 AM	0	4	5	3	12	0	0	0	0	0	0	1	0	0	1
7:30 AM	0	5	2	4	11	0	0	2	3	5	0	0	0	0	0
7:45 AM	1	2	1	9	13	0	0	0	0	0	0	2	0	0	2
8:00 AM	1	6	3	6	16	0	0	2	0	2	0	2	0	0	2
8:15 AM	1	4	3	4	12	0	0	2	0	2	0	0	0	0	0
8:30 AM	0	2	4	6	12	0	0	1	1	2	0	0	0	0	0
8:45 AM	1	4	2	5	12	0	0	0	0	0	1	1	0	0	2
Count Total	4	30	24	42	100	0	0	7	4	11	1	7	0	0	8
Peak Hour	3	16	12	21	52	0	0	5	1	6	1	3	0	0	4

Two-Hour Count Summaries - Heavy Vehicles																		
Interval Start	Miller Ave				US-101 SB Off-ramp				Airport Blvd				Airport Blvd				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM	0	0	0	0	0	2	1	0	0	0	4	0	0	0	5	0	12	0
7:15 AM	0	0	0	0	0	2	2	0	0	0	5	0	0	0	3	0	12	0
7:30 AM	0	0	0	0	0	4	1	0	0	0	2	0	0	0	4	0	11	0
7:45 AM	0	0	0	1	0	2	0	0	0	0	1	0	0	0	9	0	13	48
8:00 AM	0	0	0	1	0	5	1	0	0	0	3	0	0	0	6	0	16	52
8:15 AM	0	0	0	1	0	3	1	0	0	0	3	0	0	0	4	0	12	52
8:30 AM	0	0	0	0	0	1	1	0	0	0	4	0	0	0	6	0	12	53
8:45 AM	0	0	0	1	0	3	1	0	0	0	2	0	0	0	5	0	12	52
Count Total	0	0	0	4	0	22	8	0	0	0	24	0	0	0	42	0	100	0
Peak Hour	0	0	0	3	0	12	4	0	0	0	12	0	0	0	21	0	52	0

Two-Hour Count Summaries - Bikes																		
Interval Start	Miller Ave			US-101 SB Off-ramp			Airport Blvd			Airport Blvd			15-min Total	Rolling One Hour				
	Eastbound			Westbound			Northbound			Southbound								
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT						
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
7:30 AM	0	0	0	0	0	0	0	2	0	0	3	0	5	0				
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	5				
8:00 AM	0	0	0	0	0	0	0	2	0	0	0	0	2	7				
8:15 AM	0	0	0	0	0	0	0	2	0	0	0	0	2	9				
8:30 AM	0	0	0	0	0	0	0	1	0	0	1	0	2	6				
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	6				
Count Total	0	0	0	0	0	0	0	7	0	0	4	0	11	0				
Peak Hour	0	0	0	0	0	0	0	5	0	0	1	0	6	0				

Note: U-Turn volumes for bikes are included in Left-Turn, if any.



Two-Hour Count Summaries

Interval Start		Grand Ave Eastbound					Grand Ave Westbound					Airport Blvd Northbound					Airport Blvd Southbound					US-101 NB On-ramp Southwestbound					15-min Total	Rolling One Hour
		UT	LT	BL	TH	RT	UT	LT	TH	RT	HR	UT	LT	TH	BR	RT	UT	HL	LT	TH	RT	UT	HL	BL	BR	HR		
	7:00 AM	0	2	55	35	17	0	29	18	13	36	0	7	18	58	41	0	0	56	69	12	0	0	0	0	0	466	0
	7:15 AM	0	4	50	31	15	0	25	13	13	33	1	7	17	76	40	0	0	63	86	19	0	0	0	0	0	493	0
	7:30 AM	0	4	52	43	17	0	28	18	22	44	2	8	16	64	52	0	0	83	103	16	0	0	0	0	0	572	0
	7:45 AM	0	3	44	64	22	0	50	23	17	33	2	7	28	81	73	0	1	77	102	14	0	0	0	0	0	641	2,172
	8:00 AM	0	6	41	42	28	0	41	26	18	35	1	8	27	64	79	0	0	96	93	9	0	0	0	0	0	614	2,320
	8:15 AM	0	6	49	66	20	0	55	25	16	41	0	6	28	68	98	0	0	84	97	13	0	0	0	0	0	672	2,499
	8:30 AM	0	5	35	53	20	0	33	13	18	40	1	13	30	58	97	0	0	107	83	21	0	0	0	0	0	627	2,554
	8:45 AM	0	1	39	62	16	0	45	18	13	40	2	9	17	57	94	0	0	122	89	26	0	0	0	0	0	650	2,563
Count Total		0	31	365	396	155	0	306	154	130	302	9	65	181	526	574	0	1	688	722	130	0	0	0	0	0	4,735	0
Peak Hour	All	0	18	164	223	84	0	174	82	65	156	4	36	102	247	368	0	0	409	362	69	0	0	0	0	0	2,563	0
	HV	0	0	3	4	3	0	32	4	3	36	1	0	10	43	13	0	0	10	25	1	0	0	0	0	0	188	0
	HV%	-	0%	2%	2%	4%	-	18%	5%	5%	23%	25%	0%	10%	17%	4%	-	-	2%	7%	1%	-	-	-	-	-	7%	0

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

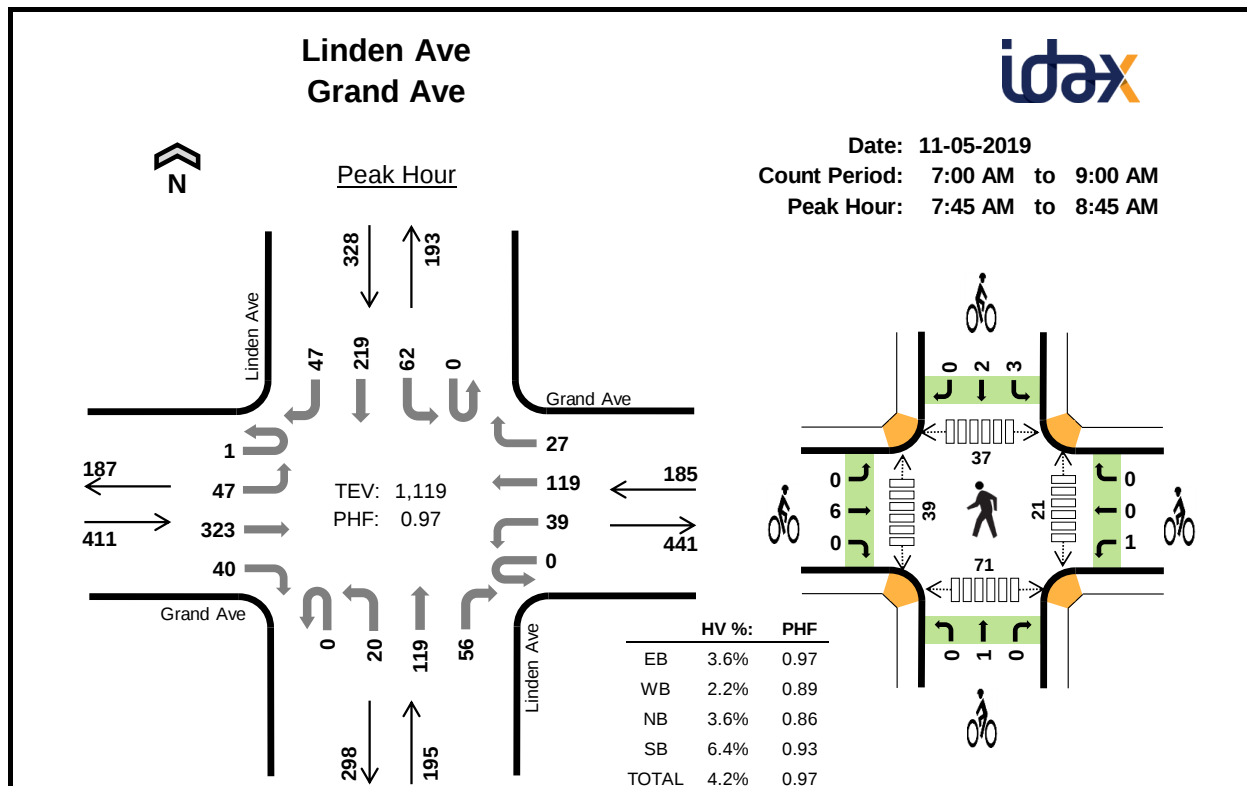
Interval Start	Heavy Vehicle Totals						Bicycles						Pedestrians (Crossing Leg)					
	EB	WB	NB	SB	SWB	Total	EB	WB	NB	SB	SWB	Total	East	West	North	South	Northeast	Total
7:00 AM	2	19	14	8	0	43	1	0	0	0	0	1	0	3	0	10	0	13
7:15 AM	3	12	15	4	0	34	2	0	0	0	0	2	1	5	0	28	0	34
7:30 AM	6	12	17	10	0	45	2	1	1	3	0	7	0	5	0	8	0	13
7:45 AM	5	15	22	10	0	52	2	0	1	0	0	3	0	7	0	14	0	21
8:00 AM	1	22	19	14	0	56	5	0	2	0	0	7	0	4	0	23	0	27
8:15 AM	2	21	18	6	0	47	1	0	2	0	0	3	0	1	0	15	0	16
8:30 AM	4	14	12	7	0	37	2	0	0	1	0	3	0	2	0	16	0	18
8:45 AM	3	18	18	9	0	48	3	0	3	0	0	6	0	5	0	13	0	18
Count Total	26	133	135	68	0	362	18	1	9	4	0	32	1	32	0	127	0	160
Peak Hr	10	75	67	36	0	188	11	0	7	1	0	19	0	12	0	67	0	79

Two-Hour Count Summaries - Heavy Vehicles

Interval Start	Grand Ave Eastbound					Grand Ave Westbound					Airport Blvd Northbound					Airport Blvd Southbound					US-101 NB On-ramp Southwestbound					15-min Total	Rolling One Hour
	UT	LT	BL	TH	RT	UT	LT	TH	RT	HR	UT	LT	TH	BR	RT	UT	HL	LT	TH	RT	UT	HL	BL	BR	HR		
7:00 AM	0	0	0	1	1	0	5	0	2	12	0	0	2	9	3	0	0	2	6	0	0	0	0	0	0	43	0
7:15 AM	0	0	0	1	2	0	6	0	1	5	0	0	3	10	2	0	0	1	3	0	0	0	0	0	0	34	0
7:30 AM	0	0	2	2	2	0	5	1	0	6	0	1	2	10	4	0	0	4	6	0	0	0	0	0	0	45	0
7:45 AM	0	0	4	0	1	0	5	3	1	6	0	1	0	19	2	0	0	4	6	0	0	0	0	0	0	52	174
8:00 AM	0	0	0	1	0	0	9	1	1	11	0	0	3	10	6	0	0	4	10	0	0	0	0	0	0	56	187
8:15 AM	0	0	1	1	0	0	11	0	1	9	0	0	2	13	3	0	0	3	2	1	0	0	0	0	0	47	200
8:30 AM	0	0	1	1	2	0	2	2	1	9	0	0	3	7	2	0	0	0	7	0	0	0	0	0	0	37	192
8:45 AM	0	0	1	1	1	0	10	1	0	7	1	0	2	13	2	0	0	3	6	0	0	0	0	0	0	48	188
Count Total	0	0	9	8	9	0	53	8	7	65	1	2	17	91	24	0	0	21	46	1	0	0	0	0	0	362	0
Peak Hour	0	0	3	4	3	0	32	4	3	36	1	0	10	43	13	0	0	10	25	1	0	0	0	0	0	188	0

Two-Hour Count Summaries - Bikes

Interval Start	Grand Ave Eastbound					Grand Ave Westbound					Airport Blvd Northbound					Airport Blvd Southbound					US-101 NB On-ramp Southwestbound					15-min Total	Rolling One Hour
	UT	LT	BL	TH	RT	UT	LT	TH	RT	HR	UT	LT	TH	BR	RT	UT	HL	LT	TH	RT	UT	HL	BL	BR	HR		
7:00 AM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
7:15 AM	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0
7:30 AM	0	1	0	0	1	0	0	1	0	0	0	0	1	0	0	0	0	0	3	0	0	0	0	0	0	7	0
7:45 AM	0	0	0	2	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	3	13
8:00 AM	0	0	0	5	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	7	19
8:15 AM	0	0	0	1	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	3	20
8:30 AM	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	3	16
8:45 AM	0	0	0	3	0	0	0	0	0	0	0	0	1	0	2	0	0	0	0	0	0	0	0	0	0	6	19
Count Total	0	2	0	15	1	0	0	1	0	0	0	0	7	0	2	0	0	1	3	0	0	0	0	0	0	32	0
Peak Hour	0	1	0	10	0	0	0	0	0	0	0	0	5	0	2	0	0	1	0	0	0	0	0	0	0	19	0

**Two-Hour Count Summaries**

Interval Start		Grand Ave				Grand Ave				Linden Ave				Linden Ave				15-min Total	Rolling One Hour
		Eastbound				Westbound				Northbound				Southbound					
		UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM		0	5	66	15	0	8	16	0	0	3	20	16	0	22	52	11	234	0
7:15 AM		0	11	61	10	0	5	23	8	0	1	18	18	0	24	51	12	242	0
7:30 AM		1	9	77	13	0	4	22	6	0	5	22	13	0	13	51	8	244	0
7:45 AM		0	13	82	11	0	10	33	6	0	5	25	16	0	16	64	4	285	1,005
8:00 AM		0	6	78	10	0	9	26	4	0	5	33	19	0	17	53	18	278	1,049
8:15 AM		0	9	84	12	0	9	35	8	0	4	29	7	0	13	41	16	267	1,074
8:30 AM		1	19	79	7	0	11	25	9	0	6	32	14	0	16	61	9	289	1,119
8:45 AM		0	17	76	13	0	10	23	12	0	8	21	10	0	13	52	13	268	1,102
Count Total		2	89	603	91	0	66	203	53	0	37	200	113	0	134	425	91	2,107	0
Peak Hour	All	1	47	323	40	0	39	119	27	0	20	119	56	0	62	219	47	1,119	0
	HV	0	8	5	2	0	1	2	1	0	2	4	1	0	1	11	9	47	0
	HV%	0%	17%	2%	5%	-	3%	2%	4%	-	10%	3%	2%	-	2%	5%	19%	4%	0

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
7:00 AM	2	1	0	4	7	0	0	0	0	0	2	4	4	15	25
7:15 AM	1	1	3	4	9	1	0	0	1	2	9	8	9	16	42
7:30 AM	2	0	1	4	7	1	0	1	2	4	8	7	3	20	38
7:45 AM	4	2	1	4	11	2	0	0	1	3	1	10	7	16	34
8:00 AM	3	0	3	12	18	0	0	0	3	3	8	10	8	11	37
8:15 AM	4	2	1	2	9	2	1	0	0	3	4	10	11	23	48
8:30 AM	4	0	2	3	9	2	0	1	1	4	8	9	11	21	49
8:45 AM	2	3	1	4	10	1	0	0	0	1	10	11	16	15	52
Count Total	22	9	12	37	80	9	1	2	8	20	50	69	69	137	325
Peak Hour	15	4	7	21	47	6	1	1	5	13	21	39	37	71	168

Two-Hour Count Summaries - Heavy Vehicles																		
Interval Start	Grand Ave				Grand Ave				Linden Ave				Linden Ave				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM	0	1	1	0	0	1	0	0	0	0	0	0	0	0	2	2	7	0
7:15 AM	0	1	0	0	0	0	1	0	0	0	2	1	0	1	0	3	9	0
7:30 AM	0	1	1	0	0	0	0	0	0	0	0	1	0	0	1	3	7	0
7:45 AM	0	3	0	1	0	0	1	1	0	0	1	0	0	0	3	1	11	34
8:00 AM	0	1	2	0	0	0	0	0	0	0	2	1	0	0	7	5	18	45
8:15 AM	0	1	2	1	0	1	1	0	0	1	0	0	0	0	0	2	9	45
8:30 AM	0	3	1	0	0	0	0	0	0	1	1	0	0	1	1	1	9	47
8:45 AM	0	2	0	0	0	0	3	0	0	0	1	0	0	0	2	2	10	46
Count Total	0	13	7	2	0	2	6	1	0	2	7	3	0	2	16	19	80	0
Peak Hour	0	8	5	2	0	1	2	1	0	2	4	1	0	1	11	9	47	0

Two-Hour Count Summaries - Bikes																		
Interval Start	Grand Ave			Grand Ave			Linden Ave			Linden Ave			15-min Total	Rolling One Hour				
	Eastbound			Westbound			Northbound			Southbound								
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT						
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
7:15 AM	0	1	0	0	0	0	0	0	0	0	1	0	2	0				
7:30 AM	0	1	0	0	0	0	0	0	1	0	2	0	4	0				
7:45 AM	0	2	0	0	0	0	0	0	0	0	1	0	3	9				
8:00 AM	0	0	0	0	0	0	0	0	0	2	1	0	3	12				
8:15 AM	0	2	0	1	0	0	0	0	0	0	0	0	3	13				
8:30 AM	0	2	0	0	0	0	0	1	0	1	0	0	4	13				
8:45 AM	0	1	0	0	0	0	0	0	0	0	0	0	1	11				
Count Total	0	9	0	1	0	0	0	1	1	3	5	0	20	0				
Peak Hour	0	6	0	1	0	0	0	1	0	3	2	0	13	0				

Note: U-Turn volumes for bikes are included in Left-Turn, if any.



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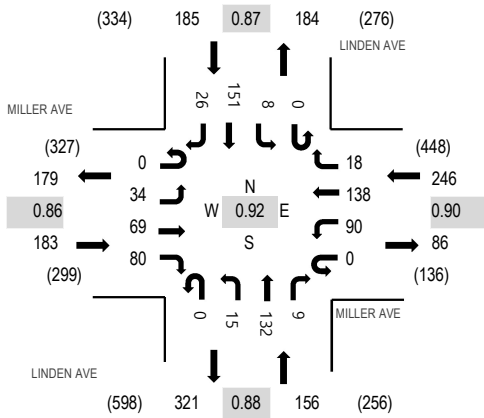
Location: 1 LINDEN AVE & MILLER AVE AM

Date: Tuesday, November 9, 2021

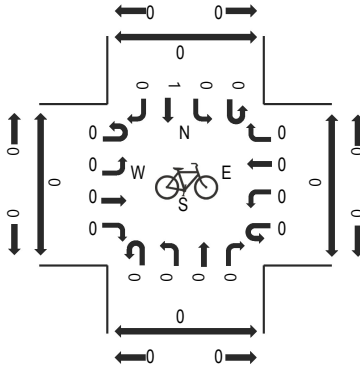
Peak Hour: 07:45 AM - 08:45 AM

Peak 15-Minutes: 08:00 AM - 08:15 AM

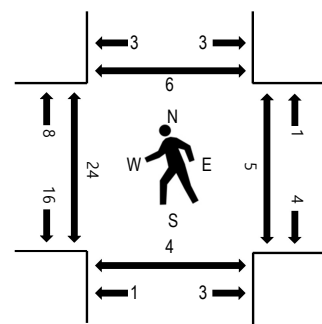
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	MILLER AVE Eastbound				MILLER AVE Westbound				LINDEN AVE Northbound				LINDEN AVE Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
7:00 AM	0	1	7	14	0	14	20	1	0	3	13	0	0	0	28	2	103	596	5	1	2	1
7:15 AM	0	4	11	20	0	17	24	5	0	8	13	2	0	0	29	4	137	702	9	0	0	0
7:30 AM	0	3	7	17	0	23	36	2	0	6	15	1	0	1	40	3	154	744	6	1	1	2
7:45 AM	0	7	26	20	0	24	41	3	0	3	28	3	0	3	36	8	202	770	8	0	0	0
8:00 AM	0	8	17	19	0	22	43	5	0	1	38	1	0	3	43	9	209	741	4	1	0	0
8:15 AM	0	8	13	24	0	20	30	3	0	7	27	2	0	1	36	8	179		5	1	2	3
8:30 AM	0	11	13	17	0	24	24	7	0	4	39	3	0	1	36	1	180		7	3	2	3
8:45 AM	0	5	13	14	0	26	33	1	0	4	29	6	0	2	35	5	173		1	6	2	5
Count Total	0	47	107	145	0	170	251	27	0	36	202	18	0	11	283	40	1,337		45	13	9	14
Peak Hour	0	34	69	80	0	90	138	18	0	15	132	9	0	8	151	26	770		24	5	4	6



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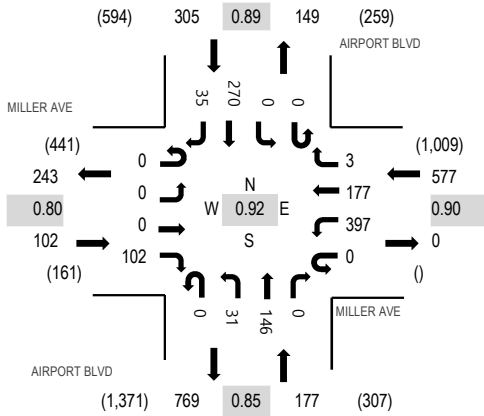
Location: 2 AIRPORT BLVD & MILLER AVE AM

Date: Tuesday, November 9, 2021

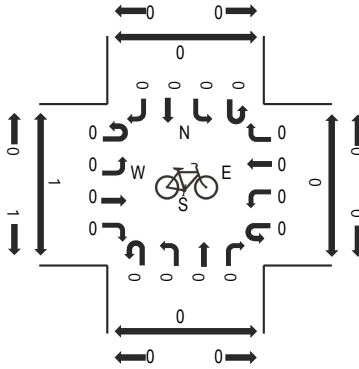
Peak Hour: 08:00 AM - 09:00 AM

Peak 15-Minutes: 08:00 AM - 08:15 AM

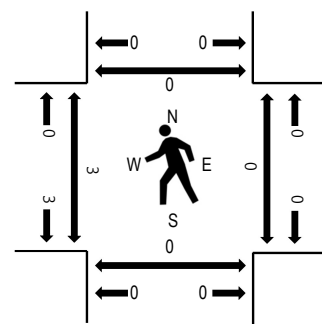
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	MILLER AVE Eastbound				MILLER AVE Westbound				AIRPORT BLVD Northbound				AIRPORT BLVD Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
7:00 AM	0	0	0	6	0	70	25	1	0	3	22	0	0	0	57	7	191	910	0	0	0	0
7:15 AM	0	0	0	12	0	79	35	0	0	6	23	0	0	0	54	5	214	1,034	0	0	0	0
7:30 AM	0	0	0	11	0	58	44	0	0	6	28	0	0	0	69	6	222	1,076	2	0	0	0
7:45 AM	0	0	0	30	0	77	42	1	0	7	35	0	0	0	79	12	283	1,137	2	0	0	0
8:00 AM	0	0	0	27	0	88	55	1	0	8	44	0	0	0	82	10	315	1,161	0	0	0	0
8:15 AM	0	0	0	13	0	92	38	1	0	8	37	0	0	0	59	8	256		0	0	0	0
8:30 AM	0	0	0	32	0	102	40	0	0	5	27	0	0	0	70	7	283		1	0	0	0
8:45 AM	0	0	0	30	0	115	44	1	0	10	38	0	0	0	59	10	307		2	0	0	0
Count Total	0	0	0	161	0	681	323	5	0	53	254	0	0	0	529	65	2,071		7	0	0	0
Peak Hour	0	0	0	102	0	397	177	3	0	31	146	0	0	0	270	35	1,161		3	0	0	0



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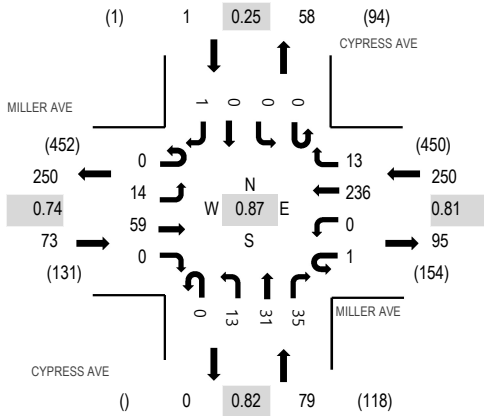
Location: 3 CYPRESS AVE & MILLER AVE AM

Date: Tuesday, November 9, 2021

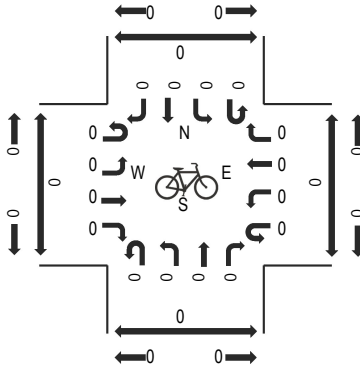
Peak Hour: 08:00 AM - 09:00 AM

Peak 15-Minutes: 08:00 AM - 08:15 AM

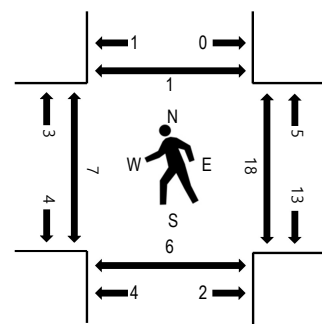
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	MILLER AVE Eastbound				MILLER AVE Westbound				CYPRESS AVE Northbound				CYPRESS AVE Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
7:00 AM	0	2	5	0	0	0	32	3	0	1	4	2	0	0	0	0	49	297	3	3	2	0
7:15 AM	0	3	10	0	0	0	45	2	0	3	4	2	0	0	0	0	69	364	0	2	2	0
7:30 AM	0	4	7	0	0	0	58	0	0	2	5	0	0	0	0	0	76	377	2	3	3	0
7:45 AM	0	1	26	0	0	0	60	0	0	1	8	7	0	0	0	0	103	395	0	4	0	1
8:00 AM	0	6	16	0	1	0	72	4	0	3	6	8	0	0	0	0	116	403	2	5	1	1
8:15 AM	0	2	8	0	0	0	52	1	0	5	9	5	0	0	0	0	82		3	2	3	0
8:30 AM	0	2	19	0	0	0	51	3	0	2	6	11	0	0	0	0	94		1	4	1	0
8:45 AM	0	4	16	0	0	0	61	5	0	3	10	11	0	0	0	1	111		1	7	1	0
Count Total	0	24	107	0	1	0	431	18	0	20	52	46	0	0	0	1	700		12	30	13	2
Peak Hour	0	14	59	0	1	0	236	13	0	13	31	35	0	0	0	1	403		7	18	6	1



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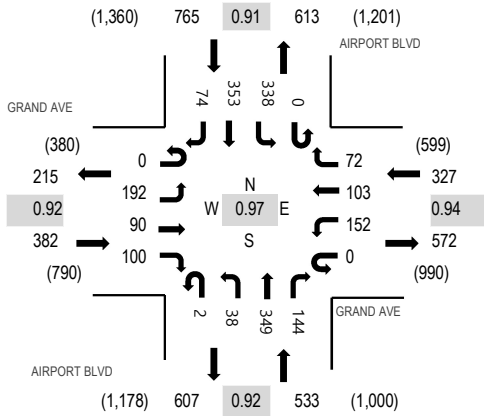
Location: 5 AIRPORT BLVD & GRAND AVE AM

Date: Tuesday, November 9, 2021

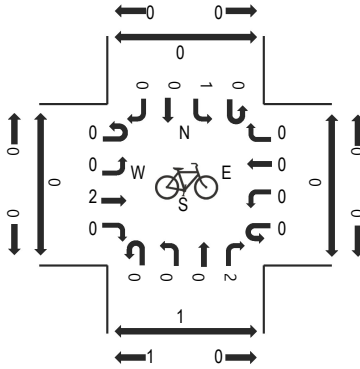
Peak Hour: 08:00 AM - 09:00 AM

Peak 15-Minutes: 08:45 AM - 09:00 AM

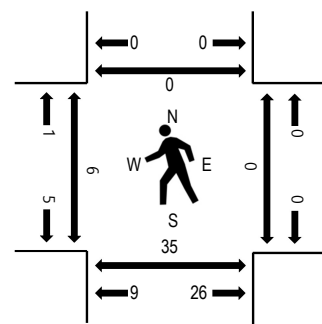
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



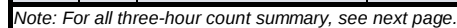
Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	GRAND AVE Eastbound				GRAND AVE Westbound				AIRPORT BLVD Northbound				AIRPORT BLVD Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
7:00 AM	0	45	13	35	0	28	21	15	1	5	73	26	0	60	65	7	394	1,742	1	0	6	0
7:15 AM	0	60	18	26	0	35	21	13	0	5	73	18	1	43	80	12	405	1,841	3	0	5	0
7:30 AM	0	57	23	32	0	26	27	16	0	10	81	29	1	42	94	7	445	1,925	2	0	10	0
7:45 AM	0	56	21	22	1	32	25	12	0	11	85	50	0	74	95	14	498	1,990	3	0	8	0
8:00 AM	0	46	16	34	0	38	27	22	0	4	92	31	0	72	94	17	493	2,007	1	0	13	0
8:15 AM	0	47	27	31	0	30	23	20	1	10	80	37	0	85	84	14	489		1	0	10	0
8:30 AM	0	60	26	13	0	43	31	13	0	12	87	37	0	81	84	23	510		2	0	6	0
8:45 AM	0	39	21	22	0	41	22	17	1	12	90	39	0	100	91	20	515		2	0	6	0
Count Total	0	410	165	215	1	273	197	128	3	69	661	267	2	557	687	114	3,749		15	0	64	0
Peak Hour	0	192	90	100	0	152	103	72	2	38	349	144	0	338	353	74	2,007		6	0	35	0



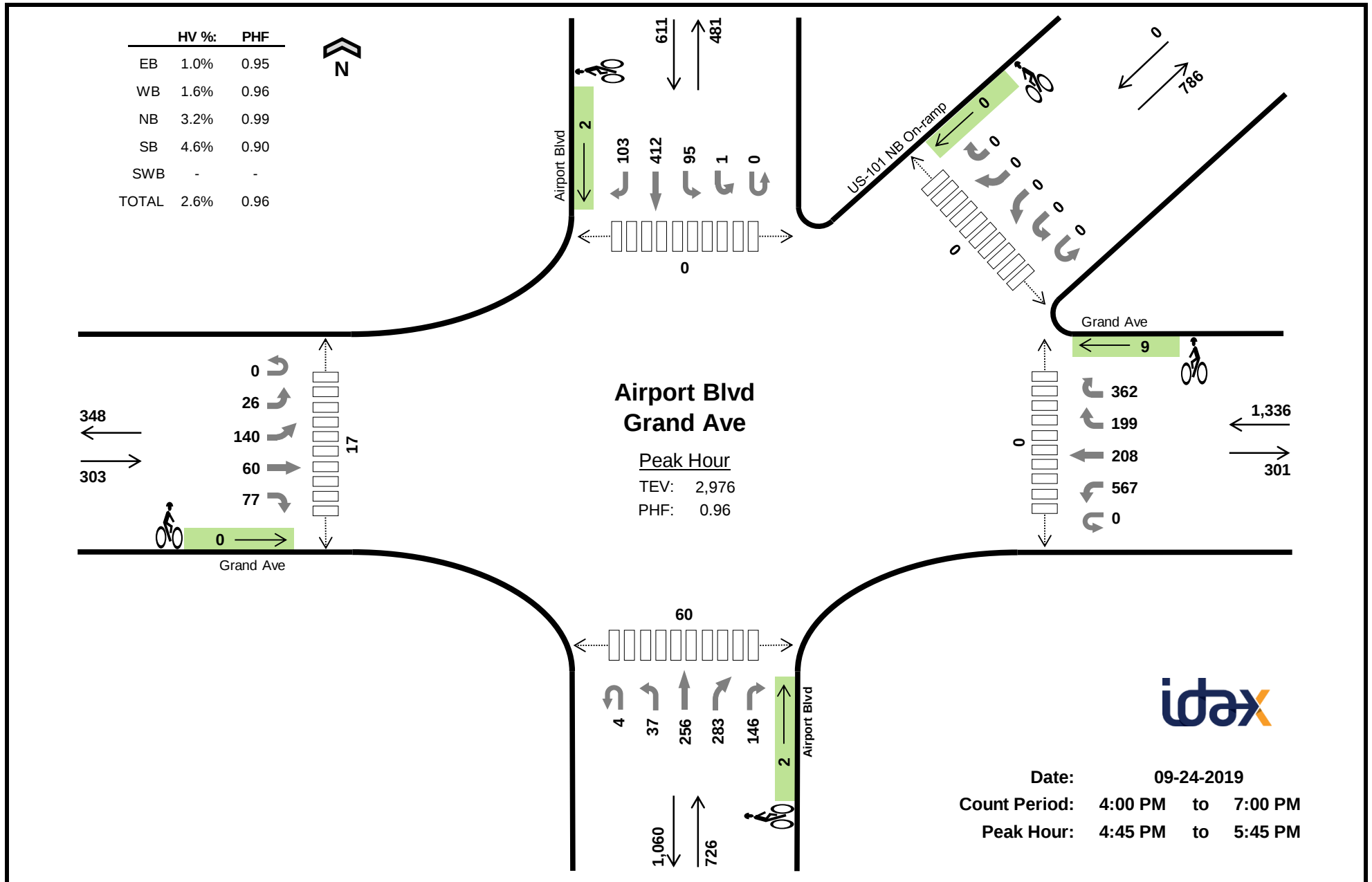
Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
5:00 PM	0	10	1	3	14	0	0	3	0	3	0	0	0	0	0
5:15 PM	1	4	5	4	14	0	0	3	0	3	0	3	0	0	3
5:30 PM	1	3	2	2	8	0	0	0	1	1	0	0	0	0	0
5:45 PM	0	4	2	2	8	0	0	0	1	1	0	1	0	0	1
Peak Hour	2	21	10	11	44	0	0	6	2	8	0	4	0	0	4

Three-Hour Count Summaries																			
Interval Start		Miller Ave				US-101 SB Off-ramp				Airport Blvd				Airport Blvd				15-min Total	Rolling One Hour
		Eastbound				Westbound				Northbound				Southbound					
		UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM		0	0	0	19	0	54	57	0	0	24	52	0	0	0	69	7	282	0
4:15 PM		0	0	0	22	0	56	56	1	0	22	68	0	0	0	64	6	295	0
4:30 PM		0	0	0	19	0	61	61	0	0	27	95	0	0	0	70	8	341	0
4:45 PM		0	0	0	12	0	58	59	1	0	31	86	0	0	0	68	14	329	1,247
5:00 PM		0	0	0	19	0	72	57	1	0	18	92	0	0	0	78	22	359	1,324
5:15 PM		0	0	0	21	0	47	56	1	0	22	101	0	0	0	82	19	349	1,378
5:30 PM		0	0	0	18	0	60	64	0	0	18	111	0	0	0	84	12	367	1,404
5:45 PM		0	0	0	18	0	64	77	0	0	15	99	0	0	0	74	17	364	1,439
6:00 PM		0	0	0	14	0	60	54	0	0	14	105	0	0	0	61	15	323	1,403
6:15 PM		0	0	0	18	0	53	43	1	0	12	99	0	0	0	74	16	316	1,370
6:30 PM		0	0	0	22	0	43	60	0	0	15	94	0	0	0	68	10	312	1,315
6:45 PM		0	0	0	18	0	52	48	0	0	15	76	0	0	0	69	5	283	1,234
Count Total		0	0	0	220	0	680	692	5	0	233	1,078	0	0	0	861	151	3,920	0
Peak Hour	All	0	0	0	76	0	243	254	2	0	73	403	0	0	0	318	70	1,439	0
	HV	0	0	0	2	0	17	4	0	0	0	10	0	0	0	11	0	44	0
	HV%	-	-	-	3%	-	7%	2%	0%	-	0%	2%	-	-	-	3%	0%	3%	0
Note: Three-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.																			
Interval Start		Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)							
		EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total			
4:00 PM		0	9	5	2	16	0	0	0	0	0	0	3	0	0	0	0	3	
4:15 PM		0	8	2	5	15	0	0	2	0	2	0	0	0	0	0	0	0	
4:30 PM		0	3	1	6	10	0	0	0	0	0	0	1	2	0	0	0	3	
4:45 PM		1	3	5	1	10	0	0	0	1	1	0	3	0	0	0	0	3	
5:00 PM		0	10	1	3	14	0	0	3	0	3	0	0	0	0	0	0	0	
5:15 PM		1	4	5	4	14	0	0	3	0	3	0	3	0	0	0	0	3	
5:30 PM		1	3	2	2	8	0	0	0	1	1	0	0	0	0	0	0	0	
5:45 PM		0	4	2	2	8	0	0	0	1	1	0	1	0	0	0	0	1	
6:00 PM		0	6	4	4	14	0	0	1	1	2	0	5	0	0	0	0	5	
6:15 PM		0	5	4	5	14	0	0	0	1	1	1	5	0	0	0	0	6	
6:30 PM		0	5	1	2	8	0	0	0	1	1	1	4	0	0	0	0	5	
6:45 PM		0	6	2	1	9	0	0	0	0	0	0	0	0	0	0	0	0	
Count Total		3	66	34	37	140	0	0	9	6	15	3	26	0	0	0	0	29	
Peak Hour		2	21	10	11	44	0	0	6	2	8	0	4	0	0	0	0	4	

Three-Hour Count Summaries - Heavy Vehicles																		
Interval Start	Miller Ave				US-101 SB Off-ramp				Airport Blvd				Airport Blvd				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM	0	0	0	0	0	7	2	0	0	0	5	0	0	0	2	0	16	0
4:15 PM	0	0	0	0	0	5	3	0	0	0	2	0	0	0	5	0	15	0
4:30 PM	0	0	0	0	0	2	1	0	0	0	1	0	0	0	5	1	10	0
4:45 PM	0	0	0	1	0	3	0	0	0	3	2	0	0	0	1	0	10	51
5:00 PM	0	0	0	0	0	9	1	0	0	0	1	0	0	0	3	0	14	49
5:15 PM	0	0	0	1	0	2	2	0	0	0	5	0	0	0	4	0	14	48
5:30 PM	0	0	0	1	0	3	0	0	0	0	2	0	0	0	2	0	8	46
5:45 PM	0	0	0	0	0	3	1	0	0	0	2	0	0	0	2	0	8	44
6:00 PM	0	0	0	0	0	4	2	0	0	0	4	0	0	0	3	1	14	44
6:15 PM	0	0	0	0	0	4	1	0	0	0	4	0	0	0	5	0	14	44
6:30 PM	0	0	0	0	0	4	1	0	0	1	0	0	0	0	2	0	8	44
6:45 PM	0	0	0	0	0	5	1	0	0	0	2	0	0	0	1	0	9	45
Count Total	0	0	0	3	0	51	15	0	0	4	30	0	0	0	35	2	140	0
Peak Hour	0	0	0	2	0	17	4	0	0	0	10	0	0	0	11	0	44	0

Three-Hour Count Summaries - Bikes																	
Interval Start	Miller Ave			US-101 SB Off-ramp			Airport Blvd			Airport Blvd			15-min Total	Rolling One Hour			
	Eastbound			Westbound			Northbound			Southbound							
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT					
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	2	0	0	0	0	0	0	2	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	3	0
5:00 PM	0	0	0	0	0	0	2	1	0	0	1	0	0	0	0	3	6
5:15 PM	0	0	0	0	0	0	0	3	0	0	3	0	0	0	0	3	7
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	8
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	8
6:00 PM	0	0	0	0	0	0	0	1	0	0	1	0	0	1	0	2	7
6:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	5
6:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	5
6:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
Count Total	0	0	0	0	0	0	0	7	0	2	5	1	0	5	1	15	0
Peak Hour	0	0	0	0	0	0	0	4	0	2	1	1	0	1	1	8	0

Note: U-Turn volumes for bikes are included in Left-Turn, if any.



Three-Hour Count Summaries

Interval Start		Grand Ave Eastbound					Grand Ave Westbound					Airport Blvd Northbound					Airport Blvd Southbound					US-101 NB On-ramp Southwestbound					15-min Total	Rolling One Hour
		UT	LT	BL	TH	RT	UT	LT	TH	RT	HR	UT	LT	TH	BR	RT	UT	HL	LT	TH	RT	UT	HL	BL	BR	HR		
4:00 PM		0	4	25	14	24	0	148	39	49	103	0	8	23	75	30	0	0	19	102	24	0	0	0	0	0	687	0
4:15 PM		0	8	29	11	16	0	127	49	54	112	0	11	30	68	28	0	0	28	84	20	0	0	0	0	0	675	0
4:30 PM		0	6	21	7	19	0	154	52	62	95	1	15	52	46	20	0	0	30	101	17	0	0	0	0	0	698	0
4:45 PM		0	8	27	16	22	0	137	47	53	101	3	13	60	68	34	0	0	20	91	21	0	0	0	0	0	721	2,781
5:00 PM		0	5	35	19	21	0	151	55	43	68	0	10	60	69	42	0	1	30	102	26	0	0	0	0	0	737	2,831
5:15 PM		0	6	40	10	20	0	133	51	53	96	0	9	71	78	26	0	0	21	104	26	0	0	0	0	0	744	2,900
5:30 PM		0	7	38	15	14	0	146	55	50	97	1	5	65	68	44	0	0	24	115	30	0	0	0	0	0	774	2,976
5:45 PM		0	10	26	15	23	0	119	38	53	79	0	11	57	89	42	0	0	19	111	21	0	0	0	0	0	713	2,968
6:00 PM		0	6	27	9	20	0	109	41	34	58	0	3	74	65	38	0	1	24	97	16	0	0	0	0	0	622	2,853
6:15 PM		0	10	20	7	22	0	90	45	31	72	0	18	78	66	17	0	1	18	102	25	0	0	0	0	0	622	2,731
6:30 PM		0	4	27	12	21	0	87	39	37	50	0	13	61	56	16	0	0	25	98	28	0	0	0	0	0	574	2,531
6:45 PM		0	6	21	15	18	0	57	32	37	44	0	12	51	52	9	1	0	18	100	21	0	0	0	0	0	494	2,312
Count Total		0	80	336	150	240	0	1,458	543	556	975	5	128	682	800	346	1	3	276	1,207	275	0	0	0	0	0	8,061	0
Peak Hour	All	0	26	140	60	77	0	567	208	199	362	4	37	256	283	146	0	1	95	412	103	0	0	0	0	0	2,976	0
	HV	0	0	0	0	3	0	10	0	6	6	0	0	7	9	7	0	0	5	22	1	0	0	0	0	0	76	0
	HV%	-	0%	0%	0%	4%	-	2%	0%	3%	2%	0%	0%	3%	3%	5%	-	0%	5%	5%	1%	-	-	-	-	-	3%	0

Note: Three-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

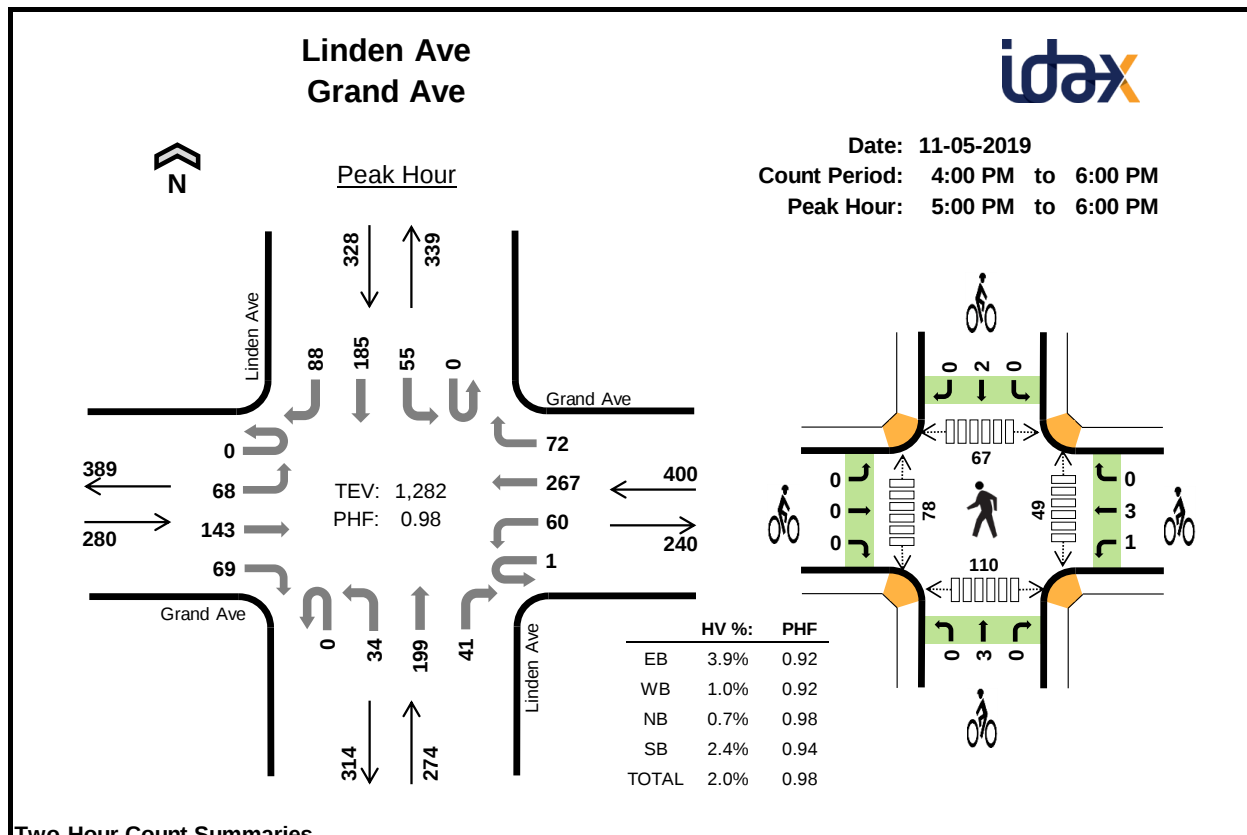
Interval Start	Heavy Vehicle Totals						Bicycles						Pedestrians (Crossing Leg)					
	EB	WB	NB	SB	SWB	Total	EB	WB	NB	SB	SWB	Total	East	West	North	South	Northeast	Total
4:00 PM	2	8	10	8	0	28	0	0	0	0	0	0	0	3	0	12	0	15
4:15 PM	1	5	7	10	0	23	0	0	2	0	0	2	0	1	0	12	0	13
4:30 PM	0	3	6	8	0	17	1	2	1	0	0	4	0	6	0	17	0	23
4:45 PM	1	12	8	5	0	26	0	1	0	1	0	2	0	4	0	9	0	13
5:00 PM	0	3	7	11	0	21	0	4	1	0	0	5	0	1	0	23	0	24
5:15 PM	1	4	7	7	0	19	0	4	1	0	0	5	0	6	0	19	0	25
5:30 PM	1	3	1	5	0	10	0	0	0	1	0	1	0	6	0	9	0	15
5:45 PM	1	3	6	5	0	15	0	3	0	0	0	3	0	5	0	28	0	33
6:00 PM	1	5	7	7	0	20	1	2	0	1	0	4	0	6	1	11	0	18
6:15 PM	2	6	6	10	0	24	0	1	0	2	0	3	0	4	0	16	0	20
6:30 PM	0	1	4	6	0	11	0	1	2	2	0	5	0	1	0	8	0	9
6:45 PM	2	3	6	7	0	18	0	1	1	0	0	2	0	2	0	18	0	20
Count Total	12	56	75	89	0	232	2	19	8	7	0	36	0	45	1	182	0	228
Peak Hr	3	22	23	28	0	76	0	9	2	2	0	13	0	17	0	60	0	77

Three-Hour Count Summaries - Heavy Vehicles

Interval Start	Grand Ave Eastbound					Grand Ave Westbound					Airport Blvd Northbound					Airport Blvd Southbound					US-101 NB On-ramp Southwestbound					15-min Total	Rolling One Hour
	UT	LT	BL	TH	RT	UT	LT	TH	RT	HR	UT	LT	TH	BR	RT	UT	HL	LT	TH	RT	UT	HL	BL	BR	HR		
4:00 PM	0	1	0	1	0	0	3	1	0	4	0	0	3	3	4	0	0	0	7	1	0	0	0	0	0	28	0
4:15 PM	0	0	1	0	0	0	2	1	0	2	0	0	2	4	1	0	0	1	6	3	0	0	0	0	0	23	0
4:30 PM	0	0	0	0	0	0	0	0	1	2	0	0	1	3	2	0	0	1	7	0	0	0	0	0	0	17	0
4:45 PM	0	0	0	0	1	0	5	0	4	3	0	0	1	3	4	0	0	2	3	0	0	0	0	0	0	26	94
5:00 PM	0	0	0	0	0	0	2	0	0	1	0	0	1	4	2	0	0	2	8	1	0	0	0	0	0	21	87
5:15 PM	0	0	0	0	1	0	1	0	1	2	0	0	4	2	1	0	0	1	6	0	0	0	0	0	0	19	83
5:30 PM	0	0	0	0	1	0	2	0	1	0	0	0	1	0	0	0	0	0	5	0	0	0	0	0	0	10	76
5:45 PM	0	0	0	0	1	0	2	0	0	1	0	1	2	2	1	0	0	0	5	0	0	0	0	0	0	15	65
6:00 PM	0	0	1	0	0	0	2	0	1	2	0	0	3	2	2	0	0	0	7	0	0	0	0	0	0	20	64
6:15 PM	0	1	0	1	0	0	4	0	0	2	0	0	3	0	3	0	0	1	9	0	0	0	0	0	0	24	69
6:30 PM	0	0	0	0	0	0	0	0	0	1	0	0	1	1	2	0	0	2	4	0	0	0	0	0	0	11	70
6:45 PM	0	0	1	1	0	0	3	0	0	0	0	0	2	2	2	0	0	2	5	0	0	0	0	0	0	18	73
Count Total	0	2	3	3	4	0	26	2	8	20	0	1	24	26	24	0	0	12	72	5	0	0	0	0	0	232	0
Peak Hour	0	0	0	0	3	0	10	0	6	6	0	0	7	9	7	0	0	5	22	1	0	0	0	0	0	76	0

Three-Hour Count Summaries - Bikes

Interval Start	Grand Ave Eastbound					Grand Ave Westbound					Airport Blvd Northbound					Airport Blvd Southbound					US-101 NB On-ramp Southwestbound					15-min Total	Rolling One Hour
	UT	LT	BL	TH	RT	UT	LT	TH	RT	HR	UT	LT	TH	BR	RT	UT	HL	LT	TH	RT	UT	HL	BL	BR	HR		
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2	0
4:30 PM	0	0	0	0	1	0	0	2	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	4	0
4:45 PM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	2	8
5:00 PM	0	0	0	0	0	0	1	1	2	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	5	13
5:15 PM	0	0	0	0	0	0	1	1	2	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	5	16
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	13
5:45 PM	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	14
6:00 PM	0	1	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	4	13
6:15 PM	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	3	11
6:30 PM	0	0	0	0	0	0	0	1	0	0	0	0	1	0	1	0	0	0	1	1	0	0	0	0	0	5	15
6:45 PM	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	2	14
Count Total	0	1	0	0	1	0	2	12	5	0	0	0	7	0	1	0	0	0	5	2	0	0	0	0	0	36	0
Peak Hour	0	0	0	0	0	0	2	3	4	0	0	0	2	0	0	0	0	0	1	1	0	0	0	0	0	13	0

**Two-Hour Count Summaries**

Interval Start		Grand Ave				Grand Ave				Linden Ave				Linden Ave				15-min Total	Rolling One Hour
		Eastbound				Westbound				Northbound				Southbound					
		UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM		0	16	40	14	0	8	49	12	0	5	42	18	0	17	37	17	275	0
4:15 PM		0	10	43	23	0	13	59	14	0	5	49	8	0	16	39	19	298	0
4:30 PM		0	15	45	14	0	12	57	16	0	8	43	13	0	9	57	14	303	0
4:45 PM		0	17	53	12	0	14	61	15	0	6	43	6	0	19	44	17	307	1,183
5:00 PM		0	24	32	20	1	19	64	14	0	8	49	8	0	17	44	17	317	1,225
5:15 PM		0	15	39	11	0	13	62	21	0	13	44	12	0	13	49	25	317	1,244
5:30 PM		0	15	32	16	0	14	80	15	0	6	56	8	0	12	50	17	321	1,262
5:45 PM		0	14	40	22	0	14	61	22	0	7	50	13	0	13	42	29	327	1,282
Count Total		0	126	324	132	1	107	493	129	0	58	376	86	0	116	362	155	2,465	0
Peak Hour	All	0	68	143	69	1	60	267	72	0	34	199	41	0	55	185	88	1,282	0
	HV	0	6	4	1	0	1	2	1	0	0	2	0	0	0	2	6	25	0
	HV%	-	9%	3%	1%	0%	2%	1%	1%	-	0%	1%	0%	-	0%	1%	7%	2%	0

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
4:00 PM	5	0	1	5	11	0	2	0	1	3	6	29	21	26	82
4:15 PM	1	1	1	3	6	0	1	0	0	1	5	24	15	25	69
4:30 PM	2	1	1	1	5	0	2	1	0	3	7	19	13	23	62
4:45 PM	3	0	0	6	9	0	2	0	2	4	13	30	17	18	78
5:00 PM	2	3	1	1	7	0	0	0	0	0	4	10	14	11	39
5:15 PM	1	0	1	3	5	0	3	2	2	7	12	21	23	41	97
5:30 PM	6	0	0	1	7	0	0	1	0	1	15	28	13	26	82
5:45 PM	2	1	0	3	6	0	1	0	0	1	18	19	17	32	86
Count Total	22	6	5	23	56	0	11	4	5	20	80	180	133	202	595
Peak Hour	11	4	2	8	25	0	4	3	2	9	49	78	67	110	304

Two-Hour Count Summaries - Heavy Vehicles																		
Interval Start	Grand Ave				Grand Ave				Linden Ave				Linden Ave				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM	0	3	2	0	0	0	0	0	0	0	0	1	0	0	1	4	11	0
4:15 PM	0	1	0	0	0	0	0	1	0	1	0	0	0	0	2	1	6	0
4:30 PM	0	2	0	0	0	1	0	0	0	0	1	0	0	0	0	1	5	0
4:45 PM	0	3	0	0	0	0	0	0	0	0	0	0	0	0	2	4	9	31
5:00 PM	0	2	0	0	0	1	1	1	0	0	1	0	0	0	0	1	7	27
5:15 PM	0	0	1	0	0	0	0	0	0	0	1	0	0	0	1	2	5	26
5:30 PM	0	4	2	0	0	0	0	0	0	0	0	0	0	0	1	0	7	28
5:45 PM	0	0	1	1	0	0	1	0	0	0	0	0	0	0	0	3	6	25
Count Total	0	15	6	1	0	2	2	2	0	1	3	1	0	0	7	16	56	0
Peak Hour	0	6	4	1	0	1	2	1	0	0	2	0	0	0	2	6	25	0

Two-Hour Count Summaries - Bikes																		
Interval Start	Grand Ave			Grand Ave			Linden Ave			Linden Ave			15-min Total	Rolling One Hour				
	Eastbound			Westbound			Northbound			Southbound								
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT						
4:00 PM	0	0	0	0	1	1	0	0	0	0	1	0	3	0				
4:15 PM	0	0	0	1	0	0	0	0	0	0	0	0	1	0				
4:30 PM	0	0	0	0	2	0	0	0	1	0	0	0	3	0				
4:45 PM	0	0	0	0	2	0	0	0	0	0	1	1	4	11				
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	8				
5:15 PM	0	0	0	0	3	0	0	2	0	0	2	0	7	14				
5:30 PM	0	0	0	0	0	0	0	1	0	0	0	0	1	12				
5:45 PM	0	0	0	1	0	0	0	0	0	0	0	0	1	9				
Count Total	0	0	0	2	8	1	0	3	1	0	4	1	20	0				
Peak Hour	0	0	0	1	3	0	0	3	0	0	2	0	9	0				

Note: U-Turn volumes for bikes are included in Left-Turn, if any.



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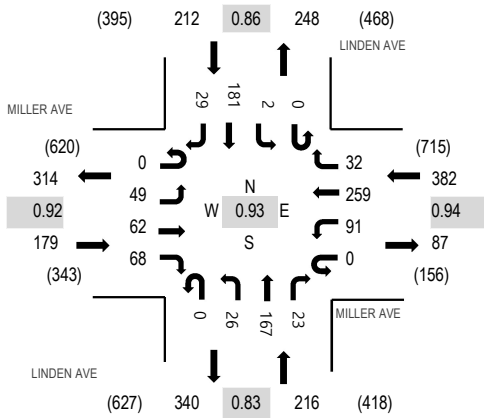
Location: 1 LINDEN AVE & MILLER AVE PM

Date: Tuesday, November 9, 2021

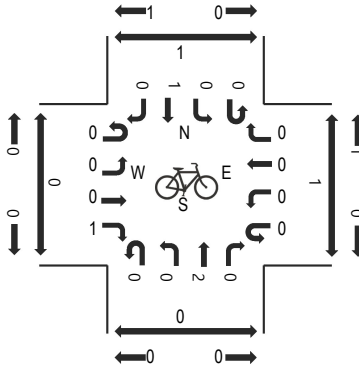
Peak Hour: 04:30 PM - 05:30 PM

Peak 15-Minutes: 04:30 PM - 04:45 PM

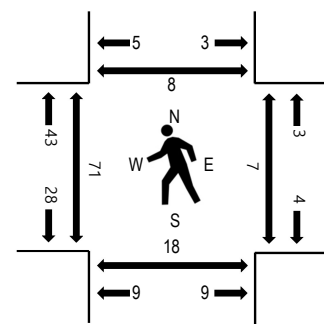
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	MILLER AVE Eastbound				MILLER AVE Westbound				LINDEN AVE Northbound				LINDEN AVE Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
4:00 PM	0	5	15	17	0	18	52	2	0	6	42	4	0	1	49	8	219	943	20	1	7	4
4:15 PM	0	10	13	18	0	20	63	2	0	9	33	3	0	3	26	6	206	962	18	0	2	1
4:30 PM	0	14	14	16	0	22	66	9	0	7	52	8	0	0	51	8	267	989	29	1	6	2
4:45 PM	0	11	20	15	0	23	53	8	0	8	44	7	0	1	51	10	251	954	23	4	6	3
5:00 PM	0	12	17	20	0	22	70	7	0	5	42	1	0	0	38	4	238	928	15	2	6	2
5:15 PM	0	12	11	17	0	24	70	8	0	6	29	7	0	1	41	7	233		4	0	0	1
5:30 PM	0	15	10	20	0	14	64	12	0	8	41	5	0	0	33	10	232		15	3	1	2
5:45 PM	0	16	8	17	0	15	61	10	0	12	32	7	0	0	40	7	225		15	0	9	0
Count Total	0	95	108	140	0	158	499	58	0	61	315	42	0	6	329	60	1,871		139	11	37	15
Peak Hour	0	49	62	68	0	91	259	32	0	26	167	23	0	2	181	29	989		71	7	18	8



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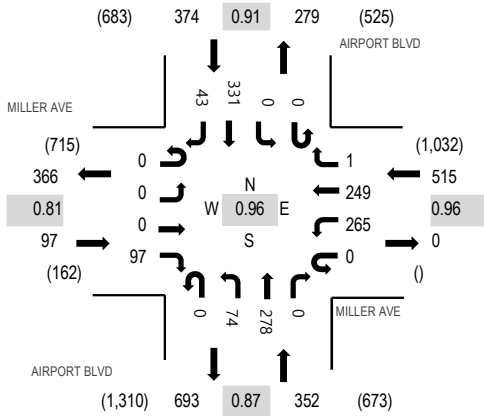
Location: 2 AIRPORT BLVD & MILLER AVE PM

Date: Tuesday, November 9, 2021

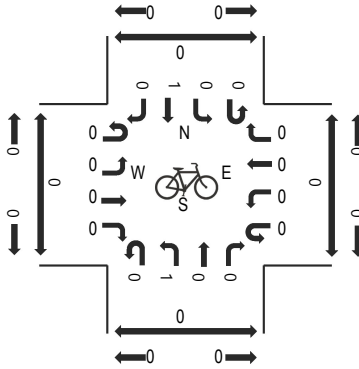
Peak Hour: 04:30 PM - 05:30 PM

Peak 15-Minutes: 05:00 PM - 05:15 PM

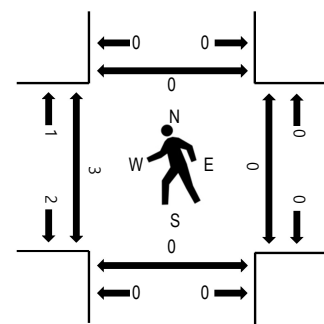
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	MILLER AVE Eastbound				MILLER AVE Westbound				AIRPORT BLVD Northbound				AIRPORT BLVD Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
4:00 PM	0	0	0	22	0	82	49	0	0	14	57	0	0	0	66	11	301	1,262	0	0	0	0
4:15 PM	0	0	0	18	0	70	56	1	1	25	57	0	0	0	61	6	295	1,308	1	0	0	0
4:30 PM	0	0	0	30	0	62	60	0	0	17	65	0	0	0	81	12	327	1,338	1	0	0	0
4:45 PM	0	0	0	26	0	68	54	0	0	17	71	0	0	0	93	10	339	1,330	2	0	0	0
5:00 PM	0	0	0	23	0	70	67	1	0	18	85	0	0	0	74	9	347	1,288	0	0	0	0
5:15 PM	0	0	0	18	0	65	68	0	0	22	57	0	0	0	83	12	325		0	0	0	0
5:30 PM	0	0	0	10	0	73	63	2	0	20	69	0	0	0	69	13	319		4	0	0	0
5:45 PM	0	0	0	15	0	55	66	0	0	18	60	0	0	0	75	8	297		3	0	0	0
Count Total	0	0	0	162	0	545	483	4	1	151	521	0	0	0	602	81	2,550		11	0	0	0
Peak Hour	0	0	0	97	0	265	249	1	0	74	278	0	0	0	331	43	1,338		3	0	0	0



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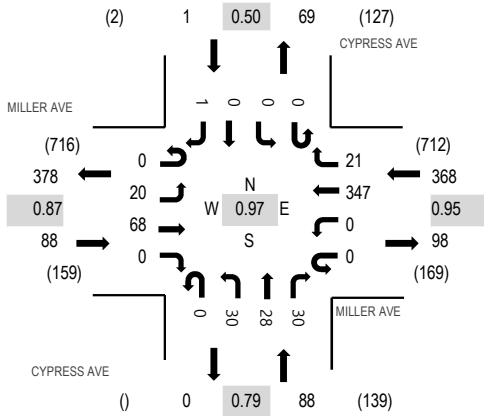
Location: 3 CYPRESS AVE & MILLER AVE PM

Date: Tuesday, November 9, 2021

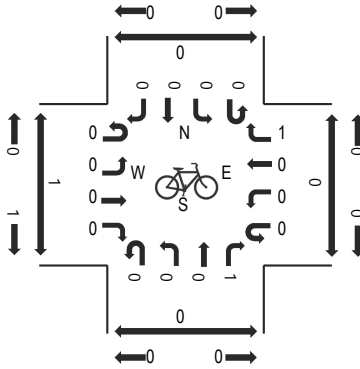
Peak Hour: 04:30 PM - 05:30 PM

Peak 15-Minutes: 04:30 PM - 04:45 PM

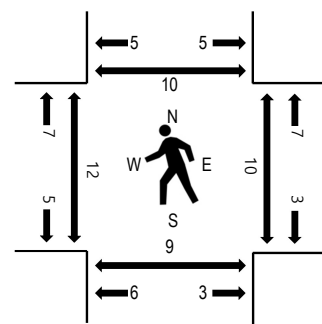
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	MILLER AVE Eastbound				MILLER AVE Westbound				CYPRESS AVE Northbound				CYPRESS AVE Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
4:00 PM	0	4	18	0	0	0	68	5	0	3	7	4	0	0	0	0	109	492	4	4	0	1
4:15 PM	0	4	14	0	0	0	82	3	0	5	4	4	0	0	0	0	116	521	2	4	1	0
4:30 PM	0	7	17	0	0	0	84	4	0	9	6	13	0	0	0	0	140	545	2	2	5	2
4:45 PM	0	6	20	0	0	0	77	4	0	8	6	5	0	0	0	1	127	525	2	4	2	4
5:00 PM	0	3	18	0	0	0	90	8	0	6	7	6	0	0	0	0	138	520	5	2	1	1
5:15 PM	0	4	13	0	0	0	96	5	0	7	9	6	0	0	0	0	140		3	2	1	3
5:30 PM	0	7	12	0	0	0	84	10	0	4	1	1	0	0	0	1	120		1	11	3	2
5:45 PM	0	2	10	0	0	0	90	2	0	1	9	8	0	0	0	0	122		1	6	3	2
Count Total	0	37	122	0	0	0	671	41	0	43	49	47	0	0	0	2	1,012		20	35	16	15
Peak Hour	0	20	68	0	0	0	347	21	0	30	28	30	0	0	0	1	545		12	10	9	10



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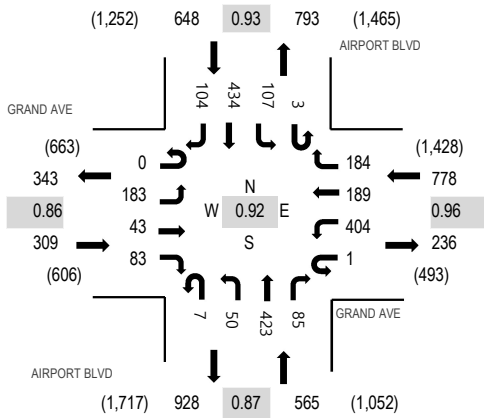
Location: 5 AIRPORT BLVD & GRAND AVE PM

Date: Tuesday, November 9, 2021

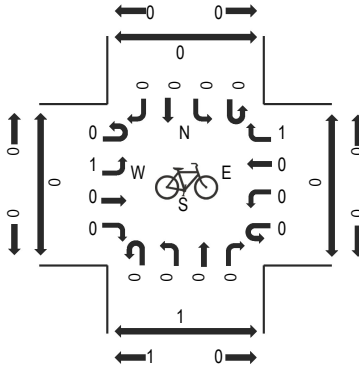
Peak Hour: 04:45 PM - 05:45 PM

Peak 15-Minutes: 05:00 PM - 05:15 PM

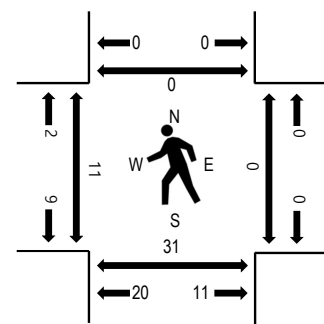
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	GRAND AVE Eastbound				GRAND AVE Westbound				AIRPORT BLVD Northbound				AIRPORT BLVD Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
4:00 PM	0	38	12	33	0	70	45	38	0	7	103	25	0	39	109	24	543	2,176	1	0	8	0
4:15 PM	0	34	12	20	0	71	49	44	3	14	79	14	0	33	95	23	491	2,259	2	0	7	0
4:30 PM	0	46	11	22	0	89	47	43	0	16	116	21	0	28	96	29	564	2,287	2	0	6	0
4:45 PM	0	51	18	26	0	94	41	46	2	17	95	22	0	27	114	25	578	2,300	3	0	9	0
5:00 PM	0	54	6	25	0	102	49	50	4	13	129	19	1	35	117	22	626	2,162	2	0	7	0
5:15 PM	0	36	8	16	1	103	58	40	0	6	92	20	0	13	100	26	519		3	0	13	0
5:30 PM	0	42	11	16	0	105	41	48	1	14	107	24	2	32	103	31	577		3	0	2	0
5:45 PM	0	28	9	32	0	66	41	47	1	8	56	24	0	29	82	17	440		3	0	9	0
Count Total	0	329	87	190	1	700	371	356	11	95	777	169	3	236	816	197	4,338		19	0	61	0
Peak Hour	0	183	43	83	1	404	189	184	7	50	423	85	3	107	434	104	2,300		11	0	31	0

Appendix B
Level Of Service Calculations

HCM 6th Signalized Intersection Summary

1: Linden Ave. & Miller Ave.

11/30/2021

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	39	79	91	103	158	21	17	151	10	9	173	30
Future Volume (veh/h)	39	79	91	103	158	21	17	151	10	9	173	30
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	41	84	97	110	168	22	18	161	11	10	184	32
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	143	292	375	172	262	375	79	661	43	47	636	107
Arrive On Green	0.24	0.24	0.24	0.24	0.24	0.24	0.42	0.42	0.42	0.42	0.42	0.42
Sat Flow, veh/h	604	1237	1585	726	1108	1585	104	1581	104	31	1521	256
Grp Volume(v), veh/h	125	0	97	278	0	22	190	0	0	226	0	0
Grp Sat Flow(s),veh/h/ln	1840	0	1585	1834	0	1585	1789	0	0	1808	0	0
Q Serve(g_s), s	6.1	0.0	5.5	15.0	0.0	1.2	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	6.1	0.0	5.5	15.0	0.0	1.2	7.3	0.0	0.0	9.1	0.0	0.0
Prop In Lane	0.33		1.00	0.40		1.00	0.09		0.06	0.04		0.14
Lane Grp Cap(c), veh/h	435	0	375	434	0	375	784	0	0	790	0	0
V/C Ratio(X)	0.29	0.00	0.26	0.64	0.00	0.06	0.24	0.00	0.00	0.29	0.00	0.00
Avail Cap(c_a), veh/h	435	0	375	434	0	375	784	0	0	790	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	34.4	0.0	34.2	37.8	0.0	32.5	20.7	0.0	0.0	21.3	0.0	0.0
Incr Delay (d2), s/veh	1.7	0.0	1.7	7.1	0.0	0.3	0.7	0.0	0.0	0.9	0.0	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	3.0	0.0	2.3	7.6	0.0	0.5	3.3	0.0	0.0	4.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	36.1	0.0	35.8	44.9	0.0	32.8	21.5	0.0	0.0	22.2	0.0	0.0
LnGrp LOS	D	A	D	D	A	C	C	A	A	C	A	A
Approach Vol, veh/h	222			300			190			226		
Approach Delay, s/veh	36.0			44.0			21.5			22.2		
Approach LOS	D			D			C			C		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	50.0			30.0			50.0			30.0		
Change Period (Y+Rc), s	4.0			4.0			4.0			4.0		
Max Green Setting (Gmax), s	46.0			26.0			46.0			26.0		
Max Q Clear Time (g_c+I1), s	9.3			8.1			11.1			17.0		
Green Ext Time (p_c), s	1.2			0.9			1.4			1.1		
Intersection Summary												
HCM 6th Ctrl Delay	32.3											
HCM 6th LOS	C											

HCM 6th TWSC
2: Miller Ave. & Cypress Avenue

11/30/2021

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	16	67	0	0	270	15	15	35	40	0	0	0
Future Vol, veh/h	16	67	0	0	270	15	15	35	40	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	16965	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	17	73	0	0	293	16	16	38	43	0	0	0

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	309	0	-
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	4.12	-	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	2.218	-	-
Pot Cap-1 Maneuver	1252	-	0
Stage 1	-	-	0
Stage 2	-	-	0
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1252	-	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	1.5	0	9.9
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	WBT	WBR
Capacity (veh/h)	836	1252	-	-	-
HCM Lane V/C Ratio	0.117	0.014	-	-	-
HCM Control Delay (s)	9.9	7.9	0	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0.4	0	-	-	-

HCM Signalized Intersection Capacity Analysis

3: Airport Blvd. & Miller Ave./101 SB/Miller Ave. Off Ramp

11/30/2021

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	103	420	195	0	22	163	0	0	317	50
Future Volume (vph)	0	0	103	420	195	0	22	163	0	0	317	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)			4.0	4.2	4.2			4.0			4.9	
Lane Util. Factor			1.00	0.95	0.95			0.95			0.95	
Frpb, ped/bikes			1.00	1.00	1.00			1.00			1.00	
Flpb, ped/bikes			1.00	1.00	1.00			1.00			1.00	
Frt			0.86	1.00	1.00			1.00			0.98	
Flt Protected			1.00	0.95	0.98			0.99			1.00	
Satd. Flow (prot)			1596	1665	1720			3380			3322	
Flt Permitted			1.00	0.95	0.98			0.99			1.00	
Satd. Flow (perm)			1596	1665	1720			3380			3322	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	0	0	111	452	210	0	24	175	0	0	341	54
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	13	0
Lane Group Flow (vph)	0	0	111	325	337	0	0	199	0	0	382	0
Confl. Peds. (#/hr)												3
Confl. Bikes (#/hr)												1
Heavy Vehicles (%)	0%	0%	3%	3%	3%	0%	0%	7%	0%	0%	6%	6%
Turn Type			Over	Split	NA		Split	NA			NA	
Protected Phases			1	6	6		1	1			4	
Permitted Phases												
Actuated Green, G (s)			13.8	60.7	60.7			13.8			17.4	
Effective Green, g (s)			13.8	60.7	60.7			13.8			17.4	
Actuated g/C Ratio			0.13	0.58	0.58			0.13			0.17	
Clearance Time (s)			4.0	4.2	4.2			4.0			4.9	
Vehicle Extension (s)			4.0	3.5	3.5			4.0			3.0	
Lane Grp Cap (vph)			209	962	994			444			550	
v/s Ratio Prot			c0.07	0.20	c0.20			0.06			c0.11	
v/s Ratio Perm												
v/c Ratio			0.53	0.34	0.34			0.45			0.69	
Uniform Delay, d1			42.6	11.6	11.6			42.1			41.3	
Progression Factor			1.00	1.00	1.00			0.85			1.00	
Incremental Delay, d2			3.3	1.0	0.9			0.9			3.8	
Delay (s)			45.9	12.6	12.5			36.9			45.1	
Level of Service			D	B	B			D			D	
Approach Delay (s)		45.9			12.6			36.9			45.1	
Approach LOS		D			B			D			D	
Intersection Summary												
HCM 2000 Control Delay			28.2									
HCM 2000 Volume to Capacity ratio			0.43									
Actuated Cycle Length (s)			105.0									
Intersection Capacity Utilization			45.2%									
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

4: Linden Ave. & Grand Ave.

11/30/2021

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	48	323	40	39	119	27	20	119	56	62	219	47
Future Volume (vph)	48	323	40	39	119	27	20	119	56	62	219	47
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0	4.0		4.0			4.0	
Lane Util. Factor		1.00	1.00		1.00	1.00		1.00			1.00	
Frpb, ped/bikes		1.00	0.90		1.00	0.94		0.99			0.99	
Flpb, ped/bikes		1.00	1.00		1.00	1.00		1.00			1.00	
Frt		1.00	0.85		1.00	0.85		0.96			0.98	
Flt Protected		0.99	1.00		0.99	1.00		0.99			0.99	
Satd. Flow (prot)		1815	1390		1840	1485		1725			1725	
Flt Permitted		0.95	1.00		0.87	1.00		0.95			0.91	
Satd. Flow (perm)		1733	1390		1619	1485		1653			1589	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	49	333	41	40	123	28	21	123	58	64	226	48
RTOR Reduction (vph)	0	0	14	0	0	16	0	24	0	0	10	0
Lane Group Flow (vph)	0	382	27	0	163	12	0	178	0	0	328	0
Confl. Peds. (#/hr)			71			37			21			39
Confl. Bikes (#/hr)			6						1			2
Heavy Vehicles (%)	4%	4%	4%	2%	2%	2%	4%	4%	4%	6%	6%	6%
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		1			1			2			2	
Permitted Phases	1		1	1		1	2			2		
Actuated Green, G (s)		26.0	26.0		26.0	26.0		26.0			26.0	
Effective Green, g (s)		26.0	26.0		26.0	26.0		26.0			26.0	
Actuated g/C Ratio		0.43	0.43		0.43	0.43		0.43			0.43	
Clearance Time (s)		4.0	4.0		4.0	4.0		4.0			4.0	
Lane Grp Cap (vph)		750	602		701	643		716			688	
v/s Ratio Prot												
v/s Ratio Perm		c0.22	0.02		0.10	0.01		0.11			c0.21	
v/c Ratio		0.51	0.04		0.23	0.02		0.25			0.48	
Uniform Delay, d1		12.4	9.8		10.7	9.7		10.8			12.1	
Progression Factor		0.72	0.74		1.00	1.00		1.00			1.00	
Incremental Delay, d2		2.4	0.1		0.8	0.1		0.8			2.4	
Delay (s)		11.3	7.4		11.5	9.8		11.6			14.5	
Level of Service		B	A		B	A		B			B	
Approach Delay (s)		10.9			11.2			11.6			14.5	
Approach LOS		B			B			B			B	
Intersection Summary												
HCM 2000 Control Delay			12.1									
HCM 2000 Volume to Capacity ratio			0.49									
Actuated Cycle Length (s)			60.0									
Intersection Capacity Utilization			77.1%									
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

5: Airport Blvd. & Grand Ave.

11/30/2021

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	182	223	84	174	116	65	40	349	368	409	362	69
Future Volume (vph)	182	223	84	174	116	65	40	349	368	409	362	69
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor		0.95		0.97	1.00	1.00	1.00	0.95	1.00	0.91	0.91	1.00
Frpb, ped/bikes		0.99		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.94
Flpb, ped/bikes		1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.97		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.98		0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.98	1.00
Satd. Flow (prot)		3006		2717	1474	1253	1490	2981	1333	1421	2947	1317
Flt Permitted		0.98		0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.98	1.00
Satd. Flow (perm)		3006		2717	1474	1253	1490	2981	1333	1421	2947	1317
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	192	235	88	183	122	68	42	367	387	431	381	73
RTOR Reduction (vph)	0	18	0	0	0	58	0	0	0	0	0	54
Lane Group Flow (vph)	0	497	0	183	122	10	42	367	387	263	549	19
Confl. Peds. (#/hr)			67									12
Confl. Bikes (#/hr)			11						7			1
Heavy Vehicles (%)	2%	2%	2%	16%	16%	16%	9%	9%	9%	4%	4%	4%
Turn Type	Split	NA		Split	NA	Perm	Split	NA	custom	Split	NA	Perm
Protected Phases	8	8!		7	7		6	6	6 7 8!	2	2	
Permitted Phases						7						2
Actuated Green, G (s)		24.4		15.1	15.1	15.1	21.6	21.6	69.1	27.9	27.9	27.9
Effective Green, g (s)		24.4		15.1	15.1	15.1	21.6	21.6	69.1	27.9	27.9	27.9
Actuated g/C Ratio		0.23		0.14	0.14	0.14	0.21	0.21	0.66	0.27	0.27	0.27
Clearance Time (s)		4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)		2.5		3.0	3.0	3.0	2.5	2.5		2.0	2.0	2.0
Lane Grp Cap (vph)		698		390	211	180	306	613	877	377	783	349
v/s Ratio Prot		c0.17		0.07	c0.08		0.03	c0.12	0.29	0.19	c0.19	
v/s Ratio Perm						0.01						0.01
v/c Ratio		0.71		0.47	0.58	0.05	0.14	0.60	0.44	0.70	0.70	0.06
Uniform Delay, d1		37.1		41.3	42.0	38.8	34.1	37.8	8.6	34.7	34.8	28.7
Progression Factor		1.00		1.00	1.00	1.00	1.42	1.30	0.37	0.95	0.95	2.04
Incremental Delay, d2		3.2		0.9	3.8	0.1	0.1	0.9	0.2	9.6	4.9	0.3
Delay (s)		40.3		42.2	45.8	38.9	48.4	49.9	3.4	42.6	37.9	59.0
Level of Service		D		D	D	D	D	D	A	D	D	E
Approach Delay (s)		40.3			42.8			27.2			41.0	
Approach LOS		D			D			C			D	

Intersection Summary

HCM 2000 Control Delay	36.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	105.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	80.1%	ICU Level of Service	D
Analysis Period (min)	15		

! Phase conflict between lane groups.

c Critical Lane Group

HCM 6th Signalized Intersection Summary

1: Linden Ave. & Miller Ave.

11/30/2021

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	56	70	77	103	294	36	29	189	26	2	205	33
Future Volume (veh/h)	56	70	77	103	294	36	29	189	26	2	205	33
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	61	76	84	112	320	39	32	205	28	2	223	36
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	193	240	375	113	323	375	97	591	77	34	656	105
Arrive On Green	0.24	0.24	0.24	0.24	0.24	0.24	0.42	0.42	0.42	0.42	0.42	0.42
Sat Flow, veh/h	815	1015	1585	479	1368	1585	144	1413	184	3	1569	252
Grp Volume(v), veh/h	137	0	84	432	0	39	265	0	0	261	0	0
Grp Sat Flow(s),veh/h/ln	1830	0	1585	1846	0	1585	1741	0	0	1823	0	0
Q Serve(g_s), s	6.8	0.0	4.7	25.7	0.0	2.1	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	6.8	0.0	4.7	25.7	0.0	2.1	10.8	0.0	0.0	10.7	0.0	0.0
Prop In Lane	0.45		1.00	0.26		1.00	0.12		0.11	0.01		0.14
Lane Grp Cap(c), veh/h	432	0	375	436	0	375	765	0	0	796	0	0
V/C Ratio(X)	0.32	0.00	0.22	0.99	0.00	0.10	0.35	0.00	0.00	0.33	0.00	0.00
Avail Cap(c_a), veh/h	432	0	375	436	0	375	765	0	0	796	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	34.7	0.0	33.9	41.9	0.0	32.9	21.8	0.0	0.0	21.7	0.0	0.0
Incr Delay (d2), s/veh	1.9	0.0	1.4	40.6	0.0	0.6	1.2	0.0	0.0	1.1	0.0	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	3.3	0.0	2.0	16.4	0.0	0.9	4.9	0.0	0.0	4.8	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	36.6	0.0	35.3	82.5	0.0	33.4	23.0	0.0	0.0	22.8	0.0	0.0
LnGrp LOS	D	A	D	F	A	C	C	A	A	C	A	A
Approach Vol, veh/h	221			471			265			261		
Approach Delay, s/veh	36.1			78.4			23.0			22.8		
Approach LOS	D			E			C			C		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	50.0			30.0			50.0			30.0		
Change Period (Y+Rc), s	4.0			4.0			4.0			4.0		
Max Green Setting (Gmax), s	46.0			26.0			46.0			26.0		
Max Q Clear Time (g_c+l1), s	12.8			8.8			12.7			27.7		
Green Ext Time (p_c), s	1.7			0.9			1.7			0.0		
Intersection Summary												
HCM 6th Ctrl Delay	46.8											
HCM 6th LOS	D											

HCM 6th TWSC
2: Miller Ave. & Cypress Avenue

11/30/2021

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	23	77	0	0	394	24	34	32	34	0	0	0
Future Vol, veh/h	23	77	0	0	394	24	34	32	34	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	16965	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	25	84	0	0	428	26	37	35	37	0	0	0

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	454	0	-
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	4.12	-	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	2.218	-	-
Pot Cap-1 Maneuver	1107	-	0
Stage 1	-	-	0
Stage 2	-	-	0
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1107	-	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	1.9	0	11.9
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	WBT	WBR
Capacity (veh/h)	632	1107	-	-	-
HCM Lane V/C Ratio	0.172	0.023	-	-	-
HCM Control Delay (s)	11.9	8.3	0	-	-
HCM Lane LOS	B	A	A	-	-
HCM 95th %tile Q(veh)	0.6	0.1	-	-	-

HCM Signalized Intersection Capacity Analysis

3: Airport Blvd. & Miller Ave./101 SB/Miller Ave. Off Ramp

11/30/2021

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations			↗	↖	↔			↕			↕	
Traffic Volume (vph)	0	0	76	243	254	0	75	412	0	0	318	70
Future Volume (vph)	0	0	76	243	254	0	75	412	0	0	318	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)			4.0	4.2	4.2			4.0			4.9	
Lane Util. Factor			1.00	0.95	0.95			0.95			0.95	
Frpb, ped/bikes			1.00	1.00	1.00			1.00			0.99	
Flpb, ped/bikes			1.00	1.00	1.00			1.00			1.00	
Frt			0.86	1.00	1.00			1.00			0.97	
Flt Protected			1.00	0.95	1.00			0.99			1.00	
Satd. Flow (prot)			1596	1649	1728			3512			3393	
Flt Permitted			1.00	0.95	1.00			0.99			1.00	
Satd. Flow (perm)			1596	1649	1728			3512			3393	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	0	0	78	248	259	0	77	420	0	0	324	71
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	35	0
Lane Group Flow (vph)	0	0	78	223	284	0	0	497	0	0	360	0
Confl. Peds. (#/hr)												4
Confl. Bikes (#/hr)												1
Heavy Vehicles (%)	0%	0%	3%	4%	4%	4%	2%	2%	0%	0%	3%	3%
Turn Type			Over	Split	NA		Split	NA			NA	
Protected Phases			1	6	6		1	1			4	
Permitted Phases												
Actuated Green, G (s)			14.3	20.9	20.9			14.3			11.7	
Effective Green, g (s)			14.3	20.9	20.9			14.3			11.7	
Actuated g/C Ratio			0.24	0.35	0.35			0.24			0.19	
Clearance Time (s)			4.0	4.2	4.2			4.0			4.9	
Vehicle Extension (s)			4.0	3.5	3.5			4.0			3.0	
Lane Grp Cap (vph)			380	574	601			837			661	
v/s Ratio Prot			0.05	0.14	c0.16			c0.14			c0.11	
v/s Ratio Perm												
v/c Ratio			0.21	0.39	0.47			0.59			0.55	
Uniform Delay, d1			18.3	14.7	15.3			20.3			21.8	
Progression Factor			1.00	1.00	1.00			0.97			1.00	
Incremental Delay, d2			0.4	2.0	2.7			1.2			0.9	
Delay (s)			18.7	16.7	17.9			20.9			22.7	
Level of Service			B	B	B			C			C	
Approach Delay (s)		18.7			17.4			20.9			22.7	
Approach LOS		B			B			C			C	
Intersection Summary												
HCM 2000 Control Delay			20.0									
HCM 2000 Volume to Capacity ratio			0.53									
Actuated Cycle Length (s)			60.0									
Intersection Capacity Utilization			49.5%									
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

4: Linden Ave. & Grand Ave.

11/30/2021

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	68	143	69	61	267	72	34	199	41	55	185	88
Future Volume (vph)	68	143	69	61	267	72	34	199	41	55	185	88
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0	4.0		4.0			4.0	
Lane Util. Factor		1.00	1.00		1.00	1.00		1.00			1.00	
Frpb, ped/bikes		1.00	0.86		1.00	0.90		0.99			0.97	
Flpb, ped/bikes		1.00	1.00		1.00	1.00		1.00			1.00	
Frt		1.00	0.85		1.00	0.85		0.98			0.96	
Flt Protected		0.98	1.00		0.99	1.00		0.99			0.99	
Satd. Flow (prot)		1798	1329		1864	1442		1810			1728	
Flt Permitted		0.82	1.00		0.91	1.00		0.94			0.91	
Satd. Flow (perm)		1502	1329		1717	1442		1703			1588	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	69	146	70	62	272	73	35	203	42	56	189	90
RTOR Reduction (vph)	0	0	40	0	0	29	0	11	0	0	22	0
Lane Group Flow (vph)	0	215	30	0	334	44	0	269	0	0	313	0
Confl. Peds. (#/hr)			110			67			49			78
Confl. Bikes (#/hr)						3			3			2
Heavy Vehicles (%)	4%	4%	4%	1%	1%	1%	1%	1%	1%	2%	2%	2%
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		1			1			2			2	
Permitted Phases	1		1	1		1	2			2		
Actuated Green, G (s)		26.0	26.0		26.0	26.0		26.0			26.0	
Effective Green, g (s)		26.0	26.0		26.0	26.0		26.0			26.0	
Actuated g/C Ratio		0.43	0.43		0.43	0.43		0.43			0.43	
Clearance Time (s)		4.0	4.0		4.0	4.0		4.0			4.0	
Lane Grp Cap (vph)		650	575		744	624		737			688	
v/s Ratio Prot												
v/s Ratio Perm		0.14	0.02		c0.19	0.03		0.16			c0.20	
v/c Ratio		0.33	0.05		0.45	0.07		0.37			0.45	
Uniform Delay, d1		11.2	9.9		12.0	9.9		11.4			12.0	
Progression Factor		1.00	1.00		0.53	0.48		1.00			1.00	
Incremental Delay, d2		1.4	0.2		1.9	0.2		1.4			2.2	
Delay (s)		12.6	10.0		8.2	5.0		12.8			14.2	
Level of Service		B	B		A	A		B			B	
Approach Delay (s)		12.0			7.6			12.8			14.2	
Approach LOS		B			A			B			B	
Intersection Summary												
HCM 2000 Control Delay			11.4									HCM 2000 Level of Service B
HCM 2000 Volume to Capacity ratio			0.45									
Actuated Cycle Length (s)			60.0									Sum of lost time (s) 8.0
Intersection Capacity Utilization			81.5%									ICU Level of Service D
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

5: Airport Blvd. & Grand Ave.

11/30/2021

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	166	60	77	650	239	205	68	539	146	103	422	112
Future Volume (vph)	166	60	77	650	239	205	68	539	146	103	422	112
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor		0.95		0.97	1.00	1.00	1.00	0.95	1.00	0.91	0.91	1.00
Frpb, ped/bikes		0.98		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.92
Flpb, ped/bikes		1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.96		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.97		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		2958		3090	1676	1425	1577	3154	1411	1408	2960	1270
Flt Permitted		0.97		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		2958		3090	1676	1425	1577	3154	1411	1408	2960	1270
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	173	62	80	677	249	214	71	561	152	107	440	117
RTOR Reduction (vph)	0	33	0	0	0	146	0	0	0	0	0	93
Lane Group Flow (vph)	0	283	0	677	249	68	71	561	152	96	451	24
Confl. Peds. (#/hr)			60									17
Confl. Bikes (#/hr)									2			2
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	3%	3%	3%	5%	5%	5%
Turn Type	Split	NA		Split	NA	Perm	Split	NA	custom	Split	NA	Perm
Protected Phases	8	8!		7	7		6	6	6 7 8!	2	2	
Permitted Phases						7						2
Actuated Green, G (s)		16.7		38.0	38.0	38.0	24.9	24.9	87.6	24.4	24.4	24.4
Effective Green, g (s)		16.7		38.0	38.0	38.0	24.9	24.9	87.6	24.4	24.4	24.4
Actuated g/C Ratio		0.14		0.32	0.32	0.32	0.21	0.21	0.73	0.20	0.20	0.20
Clearance Time (s)		4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)		2.5		3.0	3.0	3.0	2.5	2.5		2.0	2.0	2.0
Lane Grp Cap (vph)		411		978	530	451	327	654	1030	286	601	258
v/s Ratio Prot		c0.10		c0.22	0.15		0.05	c0.18	0.11	0.07	c0.15	
v/s Ratio Perm						0.05						0.02
v/c Ratio		0.69		0.69	0.47	0.15	0.22	0.86	0.15	0.34	0.75	0.09
Uniform Delay, d1		49.2		35.9	32.9	29.4	39.5	45.8	4.9	40.9	44.9	38.8
Progression Factor		1.02		1.00	1.00	1.00	1.36	1.34	0.36	1.06	1.07	1.45
Incremental Delay, d2		4.3		2.1	0.7	0.2	0.2	9.8	0.0	3.0	8.0	0.7
Delay (s)		54.2		38.0	33.6	29.6	53.8	71.0	1.8	46.4	56.0	57.0
Level of Service		D		D	C	C	D	E	A	D	E	E
Approach Delay (s)		54.2			35.5			56.0			54.8	
Approach LOS		D			D			E			D	

Intersection Summary

HCM 2000 Control Delay	47.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	92.1%	ICU Level of Service	F
Analysis Period (min)	15		

! Phase conflict between lane groups.

c Critical Lane Group

HCM 6th Signalized Intersection Summary

1: Linden Ave. & Miller Ave.

11/30/2021

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	39	79	91	113	164	22	17	152	12	11	231	31
Future Volume (veh/h)	39	79	91	113	164	22	17	152	12	11	231	31
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	41	84	97	120	174	23	18	162	13	12	246	33
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	143	292	375	177	256	375	78	651	50	47	661	86
Arrive On Green	0.24	0.24	0.24	0.24	0.24	0.24	0.42	0.42	0.42	0.42	0.42	0.42
Sat Flow, veh/h	604	1237	1585	748	1085	1585	101	1558	120	30	1580	206
Grp Volume(v), veh/h	125	0	97	294	0	23	193	0	0	291	0	0
Grp Sat Flow(s),veh/h/ln	1840	0	1585	1833	0	1585	1778	0	0	1817	0	0
Q Serve(g_s), s	6.1	0.0	5.5	16.0	0.0	1.2	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	6.1	0.0	5.5	16.0	0.0	1.2	7.5	0.0	0.0	12.1	0.0	0.0
Prop In Lane	0.33		1.00	0.41		1.00	0.09		0.07	0.04		0.11
Lane Grp Cap(c), veh/h	435	0	375	433	0	375	779	0	0	794	0	0
V/C Ratio(X)	0.29	0.00	0.26	0.68	0.00	0.06	0.25	0.00	0.00	0.37	0.00	0.00
Avail Cap(c_a), veh/h	435	0	375	433	0	375	779	0	0	794	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	34.4	0.0	34.2	38.2	0.0	32.5	20.8	0.0	0.0	22.1	0.0	0.0
Incr Delay (d2), s/veh	1.7	0.0	1.7	8.3	0.0	0.3	0.8	0.0	0.0	1.3	0.0	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	3.0	0.0	2.3	8.2	0.0	0.5	3.4	0.0	0.0	5.4	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	36.1	0.0	35.8	46.5	0.0	32.9	21.5	0.0	0.0	23.4	0.0	0.0
LnGrp LOS	D	A	D	D	A	C	C	A	A	C	A	A
Approach Vol, veh/h	222			317			193			291		
Approach Delay, s/veh	36.0			45.5			21.5			23.4		
Approach LOS	D			D			C			C		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	50.0			30.0			50.0			30.0		
Change Period (Y+Rc), s	4.0			4.0			4.0			4.0		
Max Green Setting (Gmax), s	46.0			26.0			46.0			26.0		
Max Q Clear Time (g_c+I1), s	9.5			8.1			14.1			18.0		
Green Ext Time (p_c), s	1.2			0.9			1.9			1.1		
Intersection Summary												
HCM 6th Ctrl Delay	32.6											
HCM 6th LOS	C											

HCM 6th TWSC
2: Miller Ave. & Cypress Avenue

11/30/2021

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	16	85	0	0	278	25	15	37	40	0	0	0
Future Vol, veh/h	16	85	0	0	278	25	15	37	40	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	16965	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	17	92	0	0	302	27	16	40	43	0	0	0

Major/Minor	Major1		Major2		Minor1		
Conflicting Flow All	329	0	-	-	-	0	442 455 92
Stage 1	-	-	-	-	-	-	126 126 -
Stage 2	-	-	-	-	-	-	316 329 -
Critical Hdwy	4.12	-	-	-	-	-	6.42 6.52 6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	5.42 5.52 -
Critical Hdwy Stg 2	-	-	-	-	-	-	5.42 5.52 -
Follow-up Hdwy	2.218	-	-	-	-	-	3.518 4.018 3.318
Pot Cap-1 Maneuver	1231	-	0	0	-	-	573 501 965
Stage 1	-	-	0	0	-	-	900 792 -
Stage 2	-	-	0	0	-	-	739 646 -
Platoon blocked, %	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1231	-	-	-	-	-	564 0 965
Mov Cap-2 Maneuver	-	-	-	-	-	-	564 0 -
Stage 1	-	-	-	-	-	-	887 0 -
Stage 2	-	-	-	-	-	-	739 0 -

Approach	EB	WB	NB
HCM Control Delay, s	1.3	0	10.1
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	WBT	WBR
Capacity (veh/h)	808	1231	-	-	-
HCM Lane V/C Ratio	0.124	0.014	-	-	-
HCM Control Delay (s)	10.1	8	0	-	-
HCM Lane LOS	B	A	A	-	-
HCM 95th %tile Q(veh)	0.4	0	-	-	-

HCM Signalized Intersection Capacity Analysis

3: Airport Blvd. & Miller Ave./101 SB/Miller Ave. Off Ramp

11/30/2021

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations			↗	↖	↖			↖			↗	↗
Traffic Volume (vph)	0	0	121	431	202	0	33	163	0	0	318	50
Future Volume (vph)	0	0	121	431	202	0	33	163	0	0	318	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)			4.0	4.2	4.2			4.0			4.9	
Lane Util. Factor			1.00	0.95	0.95			0.95			0.95	
Frpb, ped/bikes			1.00	1.00	1.00			1.00			1.00	
Flpb, ped/bikes			1.00	1.00	1.00			1.00			1.00	
Frt			0.86	1.00	1.00			1.00			0.98	
Flt Protected			1.00	0.95	0.98			0.99			1.00	
Satd. Flow (prot)			1596	1665	1720			3383			3322	
Flt Permitted			1.00	0.95	0.98			0.99			1.00	
Satd. Flow (perm)			1596	1665	1720			3383			3322	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	0	0	130	463	217	0	35	175	0	0	342	54
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	13	0
Lane Group Flow (vph)	0	0	130	333	347	0	0	210	0	0	383	0
Confl. Peds. (#/hr)												3
Confl. Bikes (#/hr)												1
Heavy Vehicles (%)	0%	0%	3%	3%	3%	0%	0%	7%	0%	0%	6%	6%
Turn Type			Over	Split	NA		Split	NA			NA	
Protected Phases			1	6	6		1	1			4	
Permitted Phases												
Actuated Green, G (s)			14.9	59.6	59.6			14.9			17.4	
Effective Green, g (s)			14.9	59.6	59.6			14.9			17.4	
Actuated g/C Ratio			0.14	0.57	0.57			0.14			0.17	
Clearance Time (s)			4.0	4.2	4.2			4.0			4.9	
Vehicle Extension (s)			4.0	3.5	3.5			4.0			3.0	
Lane Grp Cap (vph)			226	945	976			480			550	
v/s Ratio Prot			c0.08	0.20	c0.20			0.06			c0.12	
v/s Ratio Perm												
v/c Ratio			0.58	0.35	0.36			0.44			0.70	
Uniform Delay, d1			42.1	12.3	12.3			41.2			41.3	
Progression Factor			1.00	1.00	1.00			0.86			1.00	
Incremental Delay, d2			4.2	1.0	1.0			0.8			3.8	
Delay (s)			46.3	13.3	13.3			36.2			45.1	
Level of Service			D	B	B			D			D	
Approach Delay (s)		46.3			13.3			36.2			45.1	
Approach LOS		D			B			D			D	
Intersection Summary												
HCM 2000 Control Delay			28.6			HCM 2000 Level of Service					C	
HCM 2000 Volume to Capacity ratio			0.46									
Actuated Cycle Length (s)			105.0			Sum of lost time (s)			13.1			
Intersection Capacity Utilization			46.5%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

4: Linden Ave. & Grand Ave.

11/30/2021

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	50	329	43	46	133	28	31	119	56	98	240	58
Future Volume (vph)	50	329	43	46	133	28	31	119	56	98	240	58
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0	4.0		4.0			4.0	
Lane Util. Factor		1.00	1.00		1.00	1.00		1.00			1.00	
Frpb, ped/bikes		1.00	0.90		1.00	0.94		0.99			0.99	
Flpb, ped/bikes		1.00	1.00		1.00	1.00		1.00			1.00	
Frt		1.00	0.85		1.00	0.85		0.96			0.98	
Flt Protected		0.99	1.00		0.99	1.00		0.99			0.99	
Satd. Flow (prot)		1815	1390		1839	1485		1725			1719	
Flt Permitted		0.94	1.00		0.86	1.00		0.92			0.87	
Satd. Flow (perm)		1723	1390		1594	1485		1592			1516	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	52	339	44	47	137	29	32	123	58	101	247	60
RTOR Reduction (vph)	0	0	15	0	0	16	0	23	0	0	10	0
Lane Group Flow (vph)	0	391	29	0	184	13	0	190	0	0	398	0
Confl. Peds. (#/hr)			71			37			21			39
Confl. Bikes (#/hr)			6						1			2
Heavy Vehicles (%)	4%	4%	4%	2%	2%	2%	4%	4%	4%	6%	6%	6%
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		1			1			2			2	
Permitted Phases	1		1	1		1	2			2		
Actuated Green, G (s)		26.0	26.0		26.0	26.0		26.0			26.0	
Effective Green, g (s)		26.0	26.0		26.0	26.0		26.0			26.0	
Actuated g/C Ratio		0.43	0.43		0.43	0.43		0.43			0.43	
Clearance Time (s)		4.0	4.0		4.0	4.0		4.0			4.0	
Lane Grp Cap (vph)		746	602		690	643		689			656	
v/s Ratio Prot												
v/s Ratio Perm		c0.23	0.02		0.12	0.01		0.12			c0.26	
v/c Ratio		0.52	0.05		0.27	0.02		0.28			0.61	
Uniform Delay, d1		12.5	9.8		10.9	9.7		10.9			13.1	
Progression Factor		0.72	0.74		1.00	1.00		1.00			1.00	
Incremental Delay, d2		2.6	0.1		0.9	0.1		1.0			4.1	
Delay (s)		11.6	7.5		11.8	9.8		11.9			17.2	
Level of Service		B	A		B	A		B			B	
Approach Delay (s)		11.2			11.6			11.9			17.2	
Approach LOS		B			B			B			B	
Intersection Summary												
HCM 2000 Control Delay			13.3									
HCM 2000 Volume to Capacity ratio			0.56									
Actuated Cycle Length (s)			60.0									
Intersection Capacity Utilization			89.0%									
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

5: Airport Blvd. & Grand Ave.

11/30/2021

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	215	231	98	177	121	75	50	378	379	413	385	72
Future Volume (vph)	215	231	98	177	121	75	50	378	379	413	385	72
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor		0.95		0.97	1.00	1.00	1.00	0.95	1.00	0.91	0.91	1.00
Frpb, ped/bikes		0.99		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.94
Flpb, ped/bikes		1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.97		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.98		0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.99	1.00
Satd. Flow (prot)		2996		2717	1474	1253	1490	2981	1333	1421	2951	1317
Flt Permitted		0.98		0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.99	1.00
Satd. Flow (perm)		2996		2717	1474	1253	1490	2981	1333	1421	2951	1317
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	226	243	103	186	127	79	53	398	399	435	405	76
RTOR Reduction (vph)	0	19	0	0	0	68	0	0	0	0	0	57
Lane Group Flow (vph)	0	553	0	186	127	11	53	398	399	274	566	19
Confl. Peds. (#/hr)			67									12
Confl. Bikes (#/hr)			11						7			1
Heavy Vehicles (%)	2%	2%	2%	16%	16%	16%	9%	9%	9%	4%	4%	4%
Turn Type	Split	NA		Split	NA	Perm	Split	NA	custom	Split	NA	Perm
Protected Phases	8	8!		7	7		6	6	6 7 8!	2	2	
Permitted Phases						7						2
Actuated Green, G (s)		26.3		15.2	15.2	15.2	21.5	21.5	71.0	26.0	26.0	26.0
Effective Green, g (s)		26.3		15.2	15.2	15.2	21.5	21.5	71.0	26.0	26.0	26.0
Actuated g/C Ratio		0.25		0.14	0.14	0.14	0.20	0.20	0.68	0.25	0.25	0.25
Clearance Time (s)		4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)		2.5		3.0	3.0	3.0	2.5	2.5		2.0	2.0	2.0
Lane Grp Cap (vph)		750		393	213	181	305	610	901	351	730	326
v/s Ratio Prot		c0.18		0.07	c0.09		0.04	c0.13	0.30	c0.19	0.19	
v/s Ratio Perm						0.01						0.01
v/c Ratio		0.74		0.47	0.60	0.06	0.17	0.65	0.44	0.78	0.78	0.06
Uniform Delay, d1		36.2		41.2	42.0	38.8	34.4	38.3	7.9	36.8	36.8	30.2
Progression Factor		1.00		1.00	1.00	1.00	1.39	1.27	0.33	0.93	0.94	1.88
Incremental Delay, d2		3.6		0.9	4.4	0.1	0.1	1.6	0.2	14.8	7.4	0.3
Delay (s)		39.7		42.1	46.5	38.9	47.9	50.2	2.8	49.2	41.8	57.0
Level of Service		D		D	D	D	D	D	A	D	D	E
Approach Delay (s)		39.7			42.9			27.8			45.3	
Approach LOS		D			D			C			D	

Intersection Summary

HCM 2000 Control Delay	38.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	105.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	81.6%	ICU Level of Service	D
Analysis Period (min)	15		

! Phase conflict between lane groups.

c Critical Lane Group

HCM 6th Signalized Intersection Summary

1: Linden Ave. & Miller Ave.

11/30/2021

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	57	70	77	108	297	40	29	194	33	3	237	34
Future Volume (veh/h)	57	70	77	108	297	40	29	194	33	3	237	34
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	62	76	84	117	323	43	32	211	36	3	258	37
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	194	238	375	116	320	375	92	576	94	35	667	95
Arrive On Green	0.24	0.24	0.24	0.24	0.24	0.24	0.42	0.42	0.42	0.42	0.42	0.42
Sat Flow, veh/h	822	1007	1585	491	1355	1585	133	1377	224	4	1596	227
Grp Volume(v), veh/h	138	0	84	440	0	43	279	0	0	298	0	0
Grp Sat Flow(s),veh/h/ln	1829	0	1585	1846	0	1585	1734	0	0	1827	0	0
Q Serve(g_s), s	6.9	0.0	4.7	26.0	0.0	2.3	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	6.9	0.0	4.7	26.0	0.0	2.3	11.5	0.0	0.0	12.5	0.0	0.0
Prop In Lane	0.45		1.00	0.27		1.00	0.11		0.13	0.01		0.12
Lane Grp Cap(c), veh/h	432	0	375	436	0	375	762	0	0	797	0	0
V/C Ratio(X)	0.32	0.00	0.22	1.01	0.00	0.11	0.37	0.00	0.00	0.37	0.00	0.00
Avail Cap(c_a), veh/h	432	0	375	436	0	375	762	0	0	797	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	34.7	0.0	33.9	42.0	0.0	33.0	22.0	0.0	0.0	22.2	0.0	0.0
Incr Delay (d2), s/veh	1.9	0.0	1.4	45.2	0.0	0.6	1.4	0.0	0.0	1.3	0.0	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	3.3	0.0	2.0	17.2	0.0	1.0	5.2	0.0	0.0	5.6	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	36.6	0.0	35.3	87.2	0.0	33.6	23.3	0.0	0.0	23.6	0.0	0.0
LnGrp LOS	D	A	D	F	A	C	C	A	A	C	A	A
Approach Vol, veh/h		222			483			279			298	
Approach Delay, s/veh		36.1			82.5			23.3			23.6	
Approach LOS		D			F			C			C	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		50.0		30.0		50.0		30.0				
Change Period (Y+Rc), s		4.0		4.0		4.0		4.0				
Max Green Setting (Gmax), s		46.0		26.0		46.0		26.0				
Max Q Clear Time (g_c+l1), s		13.5		8.9		14.5		28.0				
Green Ext Time (p_c), s		1.8		0.9		1.9		0.0				
Intersection Summary												
HCM 6th Ctrl Delay				47.9								
HCM 6th LOS				D								

HCM 6th TWSC
2: Miller Ave. & Cypress Avenue

11/30/2021

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	23	87	0	0	425	63	34	42	34	0	0	0
Future Vol, veh/h	23	87	0	0	425	63	34	42	34	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	16965	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	25	95	0	0	462	68	37	46	37	0	0	0

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	530	0	-
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	4.12	-	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	2.218	-	-
Pot Cap-1 Maneuver	1037	-	0
Stage 1	-	-	0
Stage 2	-	-	0
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1037	-	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	1.8	0	12.6
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	WBT	WBR
Capacity (veh/h)	592	1037	-	-	-
HCM Lane V/C Ratio	0.202	0.024	-	-	-
HCM Control Delay (s)	12.6	8.6	0	-	-
HCM Lane LOS	B	A	A	-	-
HCM 95th %tile Q(veh)	0.8	0.1	-	-	-

HCM Signalized Intersection Capacity Analysis

3: Airport Blvd. & Miller Ave./101 SB/Miller Ave. Off Ramp

11/30/2021

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	86	281	281	0	118	413	0	0	318	70
Future Volume (vph)	0	0	86	281	281	0	118	413	0	0	318	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)			4.0	4.2	4.2			4.0			4.9	
Lane Util. Factor			1.00	0.95	0.95			0.95			0.95	
Frpb, ped/bikes			1.00	1.00	1.00			1.00			0.99	
Flpb, ped/bikes			1.00	1.00	1.00			1.00			1.00	
Frt			0.86	1.00	1.00			1.00			0.97	
Flt Protected			1.00	0.95	1.00			0.99			1.00	
Satd. Flow (prot)			1596	1649	1728			3500			3393	
Flt Permitted			1.00	0.95	1.00			0.99			1.00	
Satd. Flow (perm)			1596	1649	1728			3500			3393	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	0	0	88	287	287	0	120	421	0	0	324	71
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	35	0
Lane Group Flow (vph)	0	0	88	258	316	0	0	541	0	0	360	0
Confl. Peds. (#/hr)												4
Confl. Bikes (#/hr)												1
Heavy Vehicles (%)	0%	0%	3%	4%	4%	4%	2%	2%	0%	0%	3%	3%
Turn Type			Over	Split	NA		Split	NA			NA	
Protected Phases			1	6	6		1	1			4	
Permitted Phases												
Actuated Green, G (s)			14.9	20.3	20.3			14.9			11.7	
Effective Green, g (s)			14.9	20.3	20.3			14.9			11.7	
Actuated g/C Ratio			0.25	0.34	0.34			0.25			0.19	
Clearance Time (s)			4.0	4.2	4.2			4.0			4.9	
Vehicle Extension (s)			4.0	3.5	3.5			4.0			3.0	
Lane Grp Cap (vph)			396	557	584			869			661	
v/s Ratio Prot			0.06	0.16	c0.18			c0.15			c0.11	
v/s Ratio Perm												
v/c Ratio			0.22	0.46	0.54			0.62			0.55	
Uniform Delay, d1			17.9	15.6	16.1			20.0			21.8	
Progression Factor			1.00	1.00	1.00			0.94			1.00	
Incremental Delay, d2			0.4	2.8	3.6			1.4			0.9	
Delay (s)			18.3	18.3	19.6			20.2			22.7	
Level of Service			B	B	B			C			C	
Approach Delay (s)		18.3			19.1			20.2			22.7	
Approach LOS		B			B			C			C	
Intersection Summary												
HCM 2000 Control Delay			20.3									
HCM 2000 Volume to Capacity ratio			0.57									
Actuated Cycle Length (s)			60.0									
Intersection Capacity Utilization			52.5%									
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

4: Linden Ave. & Grand Ave.

11/30/2021

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	76	172	76	73	274	76	41	199	41	74	196	95
Future Volume (vph)	76	172	76	73	274	76	41	199	41	74	196	95
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0	4.0		4.0			4.0	
Lane Util. Factor		1.00	1.00		1.00	1.00		1.00			1.00	
Frpb, ped/bikes		1.00	0.86		1.00	0.90		0.99			0.97	
Flpb, ped/bikes		1.00	1.00		1.00	1.00		1.00			1.00	
Frt		1.00	0.85		1.00	0.85		0.98			0.96	
Flt Protected		0.98	1.00		0.99	1.00		0.99			0.99	
Satd. Flow (prot)		1799	1329		1862	1442		1810			1728	
Flt Permitted		0.82	1.00		0.89	1.00		0.92			0.88	
Satd. Flow (perm)		1491	1329		1672	1442		1668			1542	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	78	176	78	74	280	78	42	203	42	76	200	97
RTOR Reduction (vph)	0	0	41	0	0	29	0	10	0	0	21	0
Lane Group Flow (vph)	0	254	37	0	354	49	0	277	0	0	352	0
Confl. Peds. (#/hr)			110			67			49			78
Confl. Bikes (#/hr)						3			3			2
Heavy Vehicles (%)	4%	4%	4%	1%	1%	1%	1%	1%	1%	2%	2%	2%
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		1			1			2			2	
Permitted Phases	1		1	1		1	2			2		
Actuated Green, G (s)		26.0	26.0		26.0	26.0		26.0			26.0	
Effective Green, g (s)		26.0	26.0		26.0	26.0		26.0			26.0	
Actuated g/C Ratio		0.43	0.43		0.43	0.43		0.43			0.43	
Clearance Time (s)		4.0	4.0		4.0	4.0		4.0			4.0	
Lane Grp Cap (vph)		646	575		724	624		722			668	
v/s Ratio Prot												
v/s Ratio Perm		0.17	0.03		0.21	0.03		0.17			0.23	
v/c Ratio		0.39	0.06		0.49	0.08		0.38			0.53	
Uniform Delay, d1		11.6	9.9		12.2	10.0		11.6			12.5	
Progression Factor		1.00	1.00		0.59	0.65		1.00			1.00	
Incremental Delay, d2		1.8	0.2		2.2	0.2		1.5			3.0	
Delay (s)		13.4	10.1		9.4	6.7		13.1			15.4	
Level of Service		B	B		A	A		B			B	
Approach Delay (s)		12.6			8.9			13.1			15.4	
Approach LOS		B			A			B			B	
Intersection Summary												
HCM 2000 Control Delay			12.3									B
HCM 2000 Volume to Capacity ratio			0.51									
Actuated Cycle Length (s)			60.0								8.0	
Intersection Capacity Utilization			85.1%								E	
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

5: Airport Blvd. & Grand Ave.

11/30/2021

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔↔↔		↔↔↔	↑	↔	↔	↔↔	↔	↔	↔↔	↔
Traffic Volume (vph)	185	64	101	661	250	245	73	562	153	105	463	117
Future Volume (vph)	185	64	101	661	250	245	73	562	153	105	463	117
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor		0.95		0.97	1.00	1.00	1.00	0.95	1.00	0.91	0.91	1.00
Frpb, ped/bikes		0.98		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.92
Flpb, ped/bikes		1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.96		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.97		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		2938		3090	1676	1425	1577	3154	1411	1408	2961	1270
Flt Permitted		0.97		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		2938		3090	1676	1425	1577	3154	1411	1408	2961	1270
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	193	67	105	689	260	255	76	585	159	109	482	122
RTOR Reduction (vph)	0	41	0	0	0	173	0	0	0	0	0	100
Lane Group Flow (vph)	0	324	0	689	260	82	76	585	159	98	493	22
Confl. Peds. (#/hr)			60									17
Confl. Bikes (#/hr)									2			2
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	3%	3%	3%	5%	5%	5%
Turn Type	Split	NA		Split	NA	Perm	Split	NA	custom	Split	NA	Perm
Protected Phases	8	8!		7	7		6	6	6 7 8!	2	2	
Permitted Phases						7						2
Actuated Green, G (s)		18.5		38.4	38.4	38.4	25.3	25.3	90.2	21.8	21.8	21.8
Effective Green, g (s)		18.5		38.4	38.4	38.4	25.3	25.3	90.2	21.8	21.8	21.8
Actuated g/C Ratio		0.15		0.32	0.32	0.32	0.21	0.21	0.75	0.18	0.18	0.18
Clearance Time (s)		4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)		2.5		3.0	3.0	3.0	2.5	2.5		2.0	2.0	2.0
Lane Grp Cap (vph)		452		988	536	456	332	664	1060	255	537	230
v/s Ratio Prot		c0.11		c0.22	0.16		0.05	c0.19	0.11	0.07	c0.17	
v/s Ratio Perm						0.06						0.02
v/c Ratio		0.72		0.70	0.49	0.18	0.23	0.88	0.15	0.38	0.92	0.10
Uniform Delay, d1		48.3		35.7	32.8	29.4	39.3	45.9	4.2	43.2	48.2	40.9
Progression Factor		1.01		1.00	1.00	1.00	1.34	1.33	0.37	1.03	1.04	1.38
Incremental Delay, d2		4.8		2.2	0.7	0.2	0.2	12.0	0.0	4.1	22.1	0.8
Delay (s)		53.5		37.9	33.5	29.6	53.0	72.9	1.6	48.6	72.4	57.2
Level of Service		D		D	C	C	D	E	A	D	E	E
Approach Delay (s)		53.5			35.2			57.3			66.5	
Approach LOS		D			D			E			E	

Intersection Summary

HCM 2000 Control Delay	50.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	93.4%	ICU Level of Service	F
Analysis Period (min)	15		

! Phase conflict between lane groups.

c Critical Lane Group

HCM 6th Signalized Intersection Summary

1: Linden Ave. & Miller Ave.

11/30/2021

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	39	79	91	113	164	23	17	152	12	11	242	34
Future Volume (veh/h)	39	79	91	113	164	23	17	152	12	11	242	34
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	41	84	97	120	174	24	18	162	13	12	257	36
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	143	292	375	177	256	375	78	651	50	46	658	90
Arrive On Green	0.24	0.24	0.24	0.24	0.24	0.24	0.42	0.42	0.42	0.42	0.42	0.42
Sat Flow, veh/h	604	1237	1585	748	1085	1585	100	1556	120	29	1573	214
Grp Volume(v), veh/h	125	0	97	294	0	24	193	0	0	305	0	0
Grp Sat Flow(s),veh/h/ln	1840	0	1585	1833	0	1585	1776	0	0	1816	0	0
Q Serve(g_s), s	6.1	0.0	5.5	16.0	0.0	1.3	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	6.1	0.0	5.5	16.0	0.0	1.3	7.5	0.0	0.0	12.8	0.0	0.0
Prop In Lane	0.33		1.00	0.41		1.00	0.09		0.07	0.04		0.12
Lane Grp Cap(c), veh/h	435	0	375	433	0	375	779	0	0	793	0	0
V/C Ratio(X)	0.29	0.00	0.26	0.68	0.00	0.06	0.25	0.00	0.00	0.38	0.00	0.00
Avail Cap(c_a), veh/h	435	0	375	433	0	375	779	0	0	793	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	34.4	0.0	34.2	38.2	0.0	32.6	20.8	0.0	0.0	22.3	0.0	0.0
Incr Delay (d2), s/veh	1.7	0.0	1.7	8.3	0.0	0.3	0.8	0.0	0.0	1.4	0.0	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	3.0	0.0	2.3	8.2	0.0	0.5	3.4	0.0	0.0	5.8	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	36.1	0.0	35.8	46.5	0.0	32.9	21.5	0.0	0.0	23.7	0.0	0.0
LnGrp LOS	D	A	D	D	A	C	C	A	A	C	A	A
Approach Vol, veh/h		222			318			193			305	
Approach Delay, s/veh		36.0			45.5			21.5			23.7	
Approach LOS		D			D			C			C	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		50.0		30.0		50.0		30.0				
Change Period (Y+Rc), s		4.0		4.0		4.0		4.0				
Max Green Setting (Gmax), s		46.0		26.0		46.0		26.0				
Max Q Clear Time (g_c+I1), s		9.5		8.1		14.8		18.0				
Green Ext Time (p_c), s		1.2		0.9		2.0		1.1				
Intersection Summary												
HCM 6th Ctrl Delay				32.6								
HCM 6th LOS				C								

HCM 6th TWSC
2: Miller Ave. & Cypress Avenue

11/30/2021

Intersection												
Int Delay, s/veh	2.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔				
Traffic Vol, veh/h	16	85	0	0	278	30	15	50	40	0	0	0
Future Vol, veh/h	16	85	0	0	278	30	15	50	40	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	16965	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	17	92	0	0	302	33	16	54	43	0	0	0

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	335	0	-
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	4.12	-	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	2.218	-	-
Pot Cap-1 Maneuver	1224	-	0
Stage 1	-	-	0
Stage 2	-	-	0
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1224	-	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	1.3	0	10.2
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	WBT	WBR
Capacity (veh/h)	807	1224	-	-	-
HCM Lane V/C Ratio	0.141	0.014	-	-	-
HCM Control Delay (s)	10.2	8	0	-	-
HCM Lane LOS	B	A	A	-	-
HCM 95th %tile Q(veh)	0.5	0	-	-	-

HCM Signalized Intersection Capacity Analysis

3: Airport Blvd. & Miller Ave./101 SB/Miller Ave. Off Ramp

11/30/2021

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	121	431	207	0	33	163	0	0	318	50
Future Volume (vph)	0	0	121	431	207	0	33	163	0	0	318	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)			4.0	4.2	4.2			4.0			4.9	
Lane Util. Factor			1.00	0.95	0.95			0.95			0.95	
Frpb, ped/bikes			1.00	1.00	1.00			1.00			1.00	
Flpb, ped/bikes			1.00	1.00	1.00			1.00			1.00	
Frt			0.86	1.00	1.00			1.00			0.98	
Flt Protected			1.00	0.95	0.98			0.99			1.00	
Satd. Flow (prot)			1596	1665	1722			3383			3322	
Flt Permitted			1.00	0.95	0.98			0.99			1.00	
Satd. Flow (perm)			1596	1665	1722			3383			3322	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	0	0	130	463	223	0	35	175	0	0	342	54
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	13	0
Lane Group Flow (vph)	0	0	130	338	348	0	0	210	0	0	383	0
Confl. Peds. (#/hr)												3
Confl. Bikes (#/hr)												1
Heavy Vehicles (%)	0%	0%	3%	3%	3%	0%	0%	7%	0%	0%	6%	6%
Turn Type			Over	Split	NA		Split	NA			NA	
Protected Phases			1	6	6		1	1			4	
Permitted Phases												
Actuated Green, G (s)			14.9	59.6	59.6			14.9			17.4	
Effective Green, g (s)			14.9	59.6	59.6			14.9			17.4	
Actuated g/C Ratio			0.14	0.57	0.57			0.14			0.17	
Clearance Time (s)			4.0	4.2	4.2			4.0			4.9	
Vehicle Extension (s)			4.0	3.5	3.5			4.0			3.0	
Lane Grp Cap (vph)			226	945	977			480			550	
v/s Ratio Prot			c0.08	c0.20	0.20			0.06			c0.12	
v/s Ratio Perm												
v/c Ratio			0.58	0.36	0.36			0.44			0.70	
Uniform Delay, d1			42.1	12.3	12.3			41.2			41.3	
Progression Factor			1.00	1.00	1.00			0.86			1.00	
Incremental Delay, d2			4.2	1.1	1.0			0.8			3.8	
Delay (s)			46.3	13.4	13.3			36.3			45.1	
Level of Service			D	B	B			D			D	
Approach Delay (s)		46.3			13.3			36.3			45.1	
Approach LOS		D			B			D			D	
Intersection Summary												
HCM 2000 Control Delay			28.6			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			0.46									
Actuated Cycle Length (s)			105.0			Sum of lost time (s)			13.1			
Intersection Capacity Utilization			46.6%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

4: Linden Ave. & Grand Ave.

11/30/2021

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	50	333	43	46	133	28	31	119	56	103	246	58
Future Volume (vph)	50	333	43	46	133	28	31	119	56	103	246	58
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0	4.0		4.0			4.0	
Lane Util. Factor		1.00	1.00		1.00	1.00		1.00			1.00	
Frpb, ped/bikes		1.00	0.90		1.00	0.94		0.99			0.99	
Flpb, ped/bikes		1.00	1.00		1.00	1.00		1.00			1.00	
Frt		1.00	0.85		1.00	0.85		0.96			0.98	
Flt Protected		0.99	1.00		0.99	1.00		0.99			0.99	
Satd. Flow (prot)		1815	1390		1839	1485		1725			1720	
Flt Permitted		0.94	1.00		0.85	1.00		0.91			0.87	
Satd. Flow (perm)		1723	1390		1592	1485		1589			1510	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	52	343	44	47	137	29	32	123	58	106	254	60
RTOR Reduction (vph)	0	0	15	0	0	16	0	23	0	0	10	0
Lane Group Flow (vph)	0	395	29	0	184	13	0	190	0	0	410	0
Confl. Peds. (#/hr)			71			37			21			39
Confl. Bikes (#/hr)			6						1			2
Heavy Vehicles (%)	4%	4%	4%	2%	2%	2%	4%	4%	4%	6%	6%	6%
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		1			1			2			2	
Permitted Phases	1		1	1		1	2			2		
Actuated Green, G (s)		26.0	26.0		26.0	26.0		26.0			26.0	
Effective Green, g (s)		26.0	26.0		26.0	26.0		26.0			26.0	
Actuated g/C Ratio		0.43	0.43		0.43	0.43		0.43			0.43	
Clearance Time (s)		4.0	4.0		4.0	4.0		4.0			4.0	
Lane Grp Cap (vph)		746	602		689	643		688			654	
v/s Ratio Prot												
v/s Ratio Perm		c0.23	0.02		0.12	0.01		0.12			c0.27	
v/c Ratio		0.53	0.05		0.27	0.02		0.28			0.63	
Uniform Delay, d1		12.5	9.8		10.9	9.7		10.9			13.2	
Progression Factor		0.72	0.74		1.00	1.00		1.00			1.00	
Incremental Delay, d2		2.6	0.2		0.9	0.1		1.0			4.5	
Delay (s)		11.7	7.5		11.8	9.8		11.9			17.7	
Level of Service		B	A		B	A		B			B	
Approach Delay (s)		11.2			11.6			11.9			17.7	
Approach LOS		B			B			B			B	
Intersection Summary												
HCM 2000 Control Delay			13.5									
HCM 2000 Volume to Capacity ratio			0.58									
Actuated Cycle Length (s)			60.0									
Intersection Capacity Utilization			90.3%									
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

5: Airport Blvd. & Grand Ave.

11/30/2021

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	219	232	98	177	129	75	51	378	379	413	385	72
Future Volume (vph)	219	232	98	177	129	75	51	378	379	413	385	72
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor		0.95		0.97	1.00	1.00	1.00	0.95	1.00	0.91	0.91	1.00
Frpb, ped/bikes		0.99		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.94
Flpb, ped/bikes		1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.97		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.98		0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.99	1.00
Satd. Flow (prot)		2997		2717	1474	1253	1490	2981	1333	1421	2951	1317
Flt Permitted		0.98		0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.99	1.00
Satd. Flow (perm)		2997		2717	1474	1253	1490	2981	1333	1421	2951	1317
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	231	244	103	186	136	79	54	398	399	435	405	76
RTOR Reduction (vph)	0	19	0	0	0	67	0	0	0	0	0	57
Lane Group Flow (vph)	0	559	0	186	136	12	54	398	399	274	566	19
Confl. Peds. (#/hr)			67									12
Confl. Bikes (#/hr)			11						7			1
Heavy Vehicles (%)	2%	2%	2%	16%	16%	16%	9%	9%	9%	4%	4%	4%
Turn Type	Split	NA		Split	NA	Perm	Split	NA	custom	Split	NA	Perm
Protected Phases	8	8!		7	7		6	6	6 7 8!	2	2	
Permitted Phases						7						2
Actuated Green, G (s)		26.5		15.4	15.4	15.4	21.4	21.4	71.3	25.7	25.7	25.7
Effective Green, g (s)		26.5		15.4	15.4	15.4	21.4	21.4	71.3	25.7	25.7	25.7
Actuated g/C Ratio		0.25		0.15	0.15	0.15	0.20	0.20	0.68	0.24	0.24	0.24
Clearance Time (s)		4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)		2.5		3.0	3.0	3.0	2.5	2.5		2.0	2.0	2.0
Lane Grp Cap (vph)		756		398	216	183	303	607	905	347	722	322
v/s Ratio Prot		c0.19		0.07	c0.09		0.04	c0.13	0.30	c0.19	0.19	
v/s Ratio Perm						0.01						0.01
v/c Ratio		0.74		0.47	0.63	0.06	0.18	0.66	0.44	0.79	0.78	0.06
Uniform Delay, d1		36.1		41.0	42.1	38.6	34.5	38.4	7.7	37.1	37.1	30.4
Progression Factor		1.00		1.00	1.00	1.00	1.39	1.27	0.33	0.93	0.94	1.88
Incremental Delay, d2		3.6		0.9	5.6	0.1	0.2	1.7	0.2	15.6	7.8	0.3
Delay (s)		39.7		41.9	47.8	38.7	48.2	50.5	2.7	50.2	42.4	57.3
Level of Service		D		D	D	D	D	D	A	D	D	E
Approach Delay (s)		39.7			43.3			28.0			46.0	
Approach LOS		D			D			C			D	
Intersection Summary												
HCM 2000 Control Delay			38.7		HCM 2000 Level of Service					D		
HCM 2000 Volume to Capacity ratio			0.71									
Actuated Cycle Length (s)			105.0		Sum of lost time (s)					16.0		
Intersection Capacity Utilization			81.6%		ICU Level of Service					D		
Analysis Period (min)			15									
! Phase conflict between lane groups.												
c Critical Lane Group												

HCM 6th Signalized Intersection Summary

1: Linden Ave. & Miller Ave.

11/30/2021

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	57	70	77	108	297	40	29	194	33	3	251	37
Future Volume (veh/h)	57	70	77	108	297	40	29	194	33	3	251	37
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	62	76	84	117	323	43	32	211	36	3	273	40
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	194	238	375	116	320	375	92	575	93	35	665	97
Arrive On Green	0.24	0.24	0.24	0.24	0.24	0.24	0.42	0.42	0.42	0.42	0.42	0.42
Sat Flow, veh/h	822	1007	1585	491	1355	1585	132	1375	223	4	1591	231
Grp Volume(v), veh/h	138	0	84	440	0	43	279	0	0	316	0	0
Grp Sat Flow(s),veh/h/ln	1829	0	1585	1846	0	1585	1730	0	0	1826	0	0
Q Serve(g_s), s	6.9	0.0	4.7	26.0	0.0	2.3	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	6.9	0.0	4.7	26.0	0.0	2.3	11.5	0.0	0.0	13.4	0.0	0.0
Prop In Lane	0.45		1.00	0.27		1.00	0.11		0.13	0.01		0.13
Lane Grp Cap(c), veh/h	432	0	375	436	0	375	760	0	0	797	0	0
V/C Ratio(X)	0.32	0.00	0.22	1.01	0.00	0.11	0.37	0.00	0.00	0.40	0.00	0.00
Avail Cap(c_a), veh/h	432	0	375	436	0	375	760	0	0	797	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	34.7	0.0	33.9	42.0	0.0	33.0	22.0	0.0	0.0	22.5	0.0	0.0
Incr Delay (d2), s/veh	1.9	0.0	1.4	45.2	0.0	0.6	1.4	0.0	0.0	1.5	0.0	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	3.3	0.0	2.0	17.2	0.0	1.0	5.2	0.0	0.0	6.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	36.6	0.0	35.3	87.2	0.0	33.6	23.3	0.0	0.0	24.0	0.0	0.0
LnGrp LOS	D	A	D	F	A	C	C	A	A	C	A	A
Approach Vol, veh/h		222			483			279			316	
Approach Delay, s/veh		36.1			82.5			23.3			24.0	
Approach LOS		D			F			C			C	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		50.0		30.0		50.0		30.0				
Change Period (Y+Rc), s		4.0		4.0		4.0		4.0				
Max Green Setting (Gmax), s		46.0		26.0		46.0		26.0				
Max Q Clear Time (g_c+l1), s		13.5		8.9		15.4		28.0				
Green Ext Time (p_c), s		1.8		0.9		2.0		0.0				
Intersection Summary												
HCM 6th Ctrl Delay				47.6								
HCM 6th LOS				D								

HCM 6th TWSC
2: Miller Ave. & Cypress Avenue

11/30/2021

Intersection												
Int Delay, s/veh	2.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔				
Traffic Vol, veh/h	23	87	0	0	425	67	34	50	34	0	0	0
Future Vol, veh/h	23	87	0	0	425	67	34	50	34	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	16965	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	25	95	0	0	462	73	37	54	37	0	0	0

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	535	0	-
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	4.12	-	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	2.218	-	-
Pot Cap-1 Maneuver	1033	-	0
Stage 1	-	-	0
Stage 2	-	-	0
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1033	-	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	1.8	0	12.8
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	WBT	WBR
Capacity (veh/h)	591	1033	-	-	-
HCM Lane V/C Ratio	0.217	0.024	-	-	-
HCM Control Delay (s)	12.8	8.6	0	-	-
HCM Lane LOS	B	A	A	-	-
HCM 95th %tile Q(veh)	0.8	0.1	-	-	-

HCM Signalized Intersection Capacity Analysis

3: Airport Blvd. & Miller Ave./101 SB/Miller Ave. Off Ramp

11/30/2021

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	86	281	285	0	118	413	0	0	318	70
Future Volume (vph)	0	0	86	281	285	0	118	413	0	0	318	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)			4.0	4.2	4.2			4.0			4.9	
Lane Util. Factor			1.00	0.95	0.95			0.95			0.95	
Frpb, ped/bikes			1.00	1.00	1.00			1.00			0.99	
Flpb, ped/bikes			1.00	1.00	1.00			1.00			1.00	
Frt			0.86	1.00	1.00			1.00			0.97	
Flt Protected			1.00	0.95	1.00			0.99			1.00	
Satd. Flow (prot)			1596	1649	1728			3500			3393	
Flt Permitted			1.00	0.95	1.00			0.99			1.00	
Satd. Flow (perm)			1596	1649	1728			3500			3393	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	0	0	88	287	291	0	120	421	0	0	324	71
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	35	0
Lane Group Flow (vph)	0	0	88	258	320	0	0	541	0	0	360	0
Confl. Peds. (#/hr)												4
Confl. Bikes (#/hr)												1
Heavy Vehicles (%)	0%	0%	3%	4%	4%	4%	2%	2%	0%	0%	3%	3%
Turn Type			Over	Split	NA		Split	NA			NA	
Protected Phases			1	6	6		1	1			4	
Permitted Phases												
Actuated Green, G (s)			14.9	20.3	20.3			14.9			11.7	
Effective Green, g (s)			14.9	20.3	20.3			14.9			11.7	
Actuated g/C Ratio			0.25	0.34	0.34			0.25			0.19	
Clearance Time (s)			4.0	4.2	4.2			4.0			4.9	
Vehicle Extension (s)			4.0	3.5	3.5			4.0			3.0	
Lane Grp Cap (vph)			396	557	584			869			661	
v/s Ratio Prot			0.06	0.16	c0.19			c0.15			c0.11	
v/s Ratio Perm												
v/c Ratio			0.22	0.46	0.55			0.62			0.55	
Uniform Delay, d1			17.9	15.6	16.1			20.0			21.8	
Progression Factor			1.00	1.00	1.00			0.94			1.00	
Incremental Delay, d2			0.4	2.8	3.7			1.4			0.9	
Delay (s)			18.3	18.3	19.8			20.2			22.7	
Level of Service			B	B	B			C			C	
Approach Delay (s)		18.3			19.1			20.2			22.7	
Approach LOS		B			B			C			C	
Intersection Summary												
HCM 2000 Control Delay			20.3									
HCM 2000 Volume to Capacity ratio			0.57									
Actuated Cycle Length (s)			60.0									
Intersection Capacity Utilization			52.6%									
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

4: Linden Ave. & Grand Ave.

11/30/2021

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	76	174	76	73	274	76	41	199	41	81	203	95
Future Volume (vph)	76	174	76	73	274	76	41	199	41	81	203	95
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0	4.0		4.0			4.0	
Lane Util. Factor		1.00	1.00		1.00	1.00		1.00			1.00	
Frpb, ped/bikes		1.00	0.86		1.00	0.90		0.99			0.97	
Flpb, ped/bikes		1.00	1.00		1.00	1.00		1.00			1.00	
Frt		1.00	0.85		1.00	0.85		0.98			0.97	
Flt Protected		0.98	1.00		0.99	1.00		0.99			0.99	
Satd. Flow (prot)		1800	1329		1862	1442		1810			1732	
Flt Permitted		0.82	1.00		0.89	1.00		0.91			0.87	
Satd. Flow (perm)		1493	1329		1671	1442		1664			1531	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	78	178	78	74	280	78	42	203	42	83	207	97
RTOR Reduction (vph)	0	0	40	0	0	29	0	10	0	0	20	0
Lane Group Flow (vph)	0	256	38	0	354	49	0	277	0	0	367	0
Confl. Peds. (#/hr)			110			67			49			78
Confl. Bikes (#/hr)						3			3			2
Heavy Vehicles (%)	4%	4%	4%	1%	1%	1%	1%	1%	1%	2%	2%	2%
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		1			1			2			2	
Permitted Phases	1		1	1		1	2			2		
Actuated Green, G (s)		26.0	26.0		26.0	26.0		26.0			26.0	
Effective Green, g (s)		26.0	26.0		26.0	26.0		26.0			26.0	
Actuated g/C Ratio		0.43	0.43		0.43	0.43		0.43			0.43	
Clearance Time (s)		4.0	4.0		4.0	4.0		4.0			4.0	
Lane Grp Cap (vph)		646	575		724	624		721			663	
v/s Ratio Prot												
v/s Ratio Perm		0.17	0.03		c0.21	0.03		0.17			c0.24	
v/c Ratio		0.40	0.07		0.49	0.08		0.38			0.55	
Uniform Delay, d1		11.6	9.9		12.2	10.0		11.6			12.7	
Progression Factor		1.00	1.00		0.61	0.71		1.00			1.00	
Incremental Delay, d2		1.8	0.2		2.2	0.2		1.5			3.3	
Delay (s)		13.4	10.1		9.7	7.3		13.1			16.0	
Level of Service		B	B		A	A		B			B	
Approach Delay (s)		12.7			9.3			13.1			16.0	
Approach LOS		B			A			B			B	
Intersection Summary												
HCM 2000 Control Delay			12.6									B
HCM 2000 Volume to Capacity ratio			0.52									
Actuated Cycle Length (s)			60.0								8.0	
Intersection Capacity Utilization			86.9%								E	
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

5: Airport Blvd. & Grand Ave.

11/30/2021

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	190	66	101	661	255	245	74	562	153	105	463	117
Future Volume (vph)	190	66	101	661	255	245	74	562	153	105	463	117
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor		0.95		0.97	1.00	1.00	1.00	0.95	1.00	0.91	0.91	1.00
Frpb, ped/bikes		0.98		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.92
Flpb, ped/bikes		1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.96		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.97		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		2941		3090	1676	1425	1577	3154	1411	1408	2961	1270
Flt Permitted		0.97		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		2941		3090	1676	1425	1577	3154	1411	1408	2961	1270
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	198	69	105	689	266	255	77	585	159	109	482	122
RTOR Reduction (vph)	0	40	0	0	0	174	0	0	0	0	0	100
Lane Group Flow (vph)	0	332	0	689	266	81	77	585	159	98	493	22
Confl. Peds. (#/hr)			60									17
Confl. Bikes (#/hr)									2			2
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	3%	3%	3%	5%	5%	5%
Turn Type	Split	NA		Split	NA	Perm	Split	NA	custom	Split	NA	Perm
Protected Phases	8	8!		7	7		6	6	6 7 8!	2	2	
Permitted Phases						7						2
Actuated Green, G (s)		18.9		38.3	38.3	38.3	25.3	25.3	90.5	21.5	21.5	21.5
Effective Green, g (s)		18.9		38.3	38.3	38.3	25.3	25.3	90.5	21.5	21.5	21.5
Actuated g/C Ratio		0.16		0.32	0.32	0.32	0.21	0.21	0.75	0.18	0.18	0.18
Clearance Time (s)		4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)		2.5		3.0	3.0	3.0	2.5	2.5		2.0	2.0	2.0
Lane Grp Cap (vph)		463		986	534	454	332	664	1064	252	530	227
v/s Ratio Prot		c0.11		c0.22	0.16		0.05	c0.19	0.11	0.07	c0.17	
v/s Ratio Perm						0.06						0.02
v/c Ratio		0.72		0.70	0.50	0.18	0.23	0.88	0.15	0.39	0.93	0.10
Uniform Delay, d1		48.0		35.8	33.1	29.5	39.3	45.9	4.1	43.5	48.5	41.1
Progression Factor		1.01		1.00	1.00	1.00	1.35	1.33	0.37	1.03	1.04	1.38
Incremental Delay, d2		4.7		2.2	0.7	0.2	0.2	12.0	0.0	4.2	24.1	0.8
Delay (s)		53.4		38.0	33.8	29.7	53.2	72.9	1.6	49.0	74.7	57.5
Level of Service		D		D	C	C	D	E	A	D	E	E
Approach Delay (s)		53.4			35.3			57.2			68.3	
Approach LOS		D			D			E			E	
Intersection Summary												
HCM 2000 Control Delay			50.8									HCM 2000 Level of Service D
HCM 2000 Volume to Capacity ratio			0.79									
Actuated Cycle Length (s)			120.0									Sum of lost time (s) 16.0
Intersection Capacity Utilization			93.5%									ICU Level of Service F
Analysis Period (min)			15									
! Phase conflict between lane groups.												
c Critical Lane Group												