Hexagon Transportation Consultants, Inc.

500-550 Ellis Street Mixed-Use Development

Multi-Modal Transportation Analysis

Prepared for:

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Executive Summary

This report presents the results of the multi-modal transportation analysis (MTA) conducted for the proposed mixed-use development at 500-550 Ellis Street in Mountain View, California. The project is located within the Employment Character Area (North) of the East Whisman Precise Plan (EWPP) area. The 2.16-acre site is located on the northwest corner of Ellis Street and National Avenue. The project proposes to demolish the two existing office buildings totaling 32,734 square feet (s.f.) and construct a 6-level, 201 room hotel and a 2-story office building of 37,611 s.f. Vehicle parking would be provided in a four-level above grade parking garage, which would be an automatic parking structure within the hotel to be shared between office and hotel uses. Vehicle access to and from the site and garage would be from one full access driveway on National Avenue and one outbound only driveway on Ellis Street in the northeast corner of the site.

The MTA evaluates potential transportation effects of the project in accordance with the standards and methodologies set forth by the City of Mountain View's *MTA Handbook.* The MTA includes an analysis of the traffic operational effects of the project on the key intersections in the vicinity of the site, an evaluation of City policy conformance, a review of site access and on-site circulation, an evaluation of potential adverse effects on transit services and pedestrian and bicycle facilities, and a parking evaluation.

VMT Analysis

The Mountain View Vehicle Miles Traveled (VMT) Policy establishes screening criteria for developments that are expected to cause a less-than-significant transportation impact under the California Environmental Quality Act (CEQA), which confirm no further VMT analysis is required. The project would meet the screening criteria for projects located within one-half mile of transit.

The proximity to transit screening criterion was developed based on the CEQA Guidelines Section 15064.3, subdivision (b)(1), which states lead agencies generally should presume that certain projects proposed within a half mile of an existing major transit stop or an existing stop along a high-quality transit corridor will have a less-than-significant impact on VMT. The project is located within a half mile of the Bayshore/NASA and Middlefield LRT Stations, which are considered major transit stops, and complies with the Mountain View VMT Policy.

Project Trip Estimates

Trip generation estimates for the proposed project were based on trip rates published in the Institute of Transportation Engineers' (ITE) *Trip Generation Manual*, 11th Edition, and the trip caps for new office developments in the EWPP area. After applying the existing trip credits, the net new project trips would be 1,072 daily trips, including 115 AM peak hour trips (64 inbound trips and 51 outbound trips), and 88 PM peak hour trips (46 inbound trips and 42 outbound trips).

Intersection Level of Service Analysis

The results of the intersection level of service analysis (see Table ES-1) show that all study intersections would operate at an acceptable level of service with and without the project.

Pedestrian and Bicycle Operations

The project would have an adverse effect on pedestrian operations because the project is expected to add vehicle trips to nearby street segments that have a pedestrian quality of service (PQOS) score of 3 or more. The project would provide an east-west multi-use paseo between the hotel and office buildings for public and employee access between the sidewalks on Ellis Street and the planned public multi-use paseo west of the project site, which would ultimately connect to the existing public multi-use paseo between National Avenue and N. Whisman Road. The project would improve the curb ramps at the northwest corner of Ellis Street and National Avenue. The project would also provide wider sidewalks with landscaping along the project frontages on National Avenue and Ellis Street to enhance the pedestrian environment. These project improvements would address the project's adverse effects on pedestrian operations.

The project would create an adverse effect on bicycle operations, as the project is expected to add vehicle trips to Whisman Road, Ellis Street, and Middlefield Street, which have a bicycle level of service (BLTS) of 3 or more. The EWPP proposes to implement buffered bike lanes on Maude Avenue, National Avenue, Ellis Street, and Middlefield Road where the project would add vehicle trips. The project will be required to contribute to the bike lane improvements identified by the EWPP by paying for the EWPP Development Impact Fee, which would address the adverse effects.

Other Transportation Issues

Hexagon has the following recommendations resulting from the on-site circulation and parking evaluations.

Recommendations

- The project should designate one of the surface parking spaces west of the office as a short-term passenger loading space to ensure that the rideshare vehicles do not block the drive aisle while waiting.
- The project should reserve 70 spaces in the garage for office employees between the hours of 9 AM and 5 PM.

Table ES-1
Intersection Level of Service Summary

					Existing		Background		Background+Project			
ID	Intersection	LOS Standard	Peak Hour	Count Date	Avg. Delay[1]	LOS	Avg. Delay[1]	LOS	Avg. Delay[1]	LOS	Incr. In Crit. Del.	Incr. In Crit. V/C
1	Ellis St and Manila Dr	D	AM	11/15/22	10.4	B	12.2	B	12.2	B	--	--
	(all-way stop)		PM	11/15/22	8.3	A	8.8	A	8.8	A	--	--
2	Ellis St and US 101 NB Ramps	D	AM	11/15/22	12.4	B	14.6	B	14.9	B	0.3	0.015
			PM	11/15/22	19.2	B	20.1	C	20.4	C	0.3	0.014
3	Ellis St and US 101 SB Ramps	D	AM	11/15/22	12.9	B	15.7	B	16.1	B	0.7	0.020
			PM	11/15/22	10.6	B	16.2	B	17.3	B	2.6	0.008
4	Ellis St and Fairchild Dr	D	AM	11/15/22	14.5	B	15.7	B	15.7	B	0.0	0.019
			PM	11/15/22	12.6	B	14.8	B	14.9	B	0.2	0.015
5	Ellis St and National Ave	D	AM	11/15/22	10.0	A	11.1	B	13.4	B	--	--
	(one-way stop)		PM	11/15/22	10.3	B	12.3	B	13.3	B	--	--
6	SR 237 Ramps and Maude Ave	D	AM	11/15/22	41.8	D	53.6	D	53.6	D	0.1	0.002
			PM	11/15/22	37.8	D	39.5	D	39.5	D	0.0	0.001
7	Whisman Rd and Middlefield Rd	D	AM	11/15/22	26.3	C	26.4	C	26.4	C	0.0	0.004
			PM	11/15/22	29.2	C	29.0	C	29.0	C	0.1	0.004
8	Ellis St and Middlefield Rd	D	AM	11/15/22	12.6	B	15.9	B	16.4	B	0.5	0.034
			PM	11/15/22	18.1	B	21.2	C	21.5	C	0.3	0.014
9	Logue Ave and Middlefield Rd	D	AM	11/15/22	15.2	B	20.2	C	20.0	C	-0.1	0.007
			PM	11/15/22	14.4	B	19.5	B	19.3	B	-0.1	0.004
10	Ferguson Dr and Middlefield Rd	D	AM	11/15/22	11.8	B	10.8	B	10.7	B	-0.1	0.006
			PM	11/15/22	8.9	A	8.6	A	8.6	A	0.0	0.005
11	SR 237 WB Ramps and Middlefield Rd	D	AM	11/15/22	20.9	C	20.8	C	20.8	C	0.0	0.004
			PM	11/15/22	22.9	C	23.1	C	23.3	C	1.4	-0.004
12	SR 237 EB Ramps and Middlefield Rd	D	AM	11/15/22	20.8	C	21.7	C	21.7	C	0.1	0.003
			PM	11/15/22	21.3	C	21.8	C	21.8	C	0.0	0.001
13	Mary Ave and Central Expy*	E	AM	11/15/22	42.7	D	44.0	D	44.0	D	0.0	0.002
			PM	11/15/22	47.9	D	48.5	D	48.6	D	0.0	0.001
14	Ferguson Dr and Central Expy*	E	AM	11/15/22	4.4	A	4.4	A	4.4	A	0.0	0.000
			PM	11/15/22	5.0	A	5.5	A	5.5	A	0.0	0.000

Notes:
* Denotes VTA CMP intersection
1. Weighted average control delay measured in seconds per vehicle for signalized and all-way stop intersections. Worst approach delay (seconds per vehicle) and LOS are reported for side stop-controlled intersections.

1. Introduction

This report presents the results of the multi-modal transportation analysis (MTA) conducted for the proposed mixed-use development at 500-550 Ellis Street in Mountain View, California (see Figure 1). The project is located within the Employment Character Area (North) of the East Whisman Precise Plan (EWPP) area. The 2.16-acre site is located on the northwest corner of Ellis Street and National Avenue. The project proposes to demolish the two existing office buildings totaling 32,734 square feet (s.f.) and construct a 6-level, 201 room hotel and a 2-story office building of 37,611 s.f. Vehicle parking would be provided in a four-level above grade parking garage, which would be an automatic parking structure within the hotel to be shared between office and hotel uses. Vehicle access to and from the site and garage would be via one full access driveway on National Avenue and one outbound only driveway on Ellis Street in the northeast corner of the site (see Figure 2).

Scope of Study

The purpose of the study is to evaluate potential transportation effects of the project in accordance with the standards and methodologies set forth by the City of Mountain View and the Santa Clara Valley Transportation Authority (VTA). The VTA administers the Congestion Management Program (CMP).

The MTA is prepared based on the City's *MTA Handbook* (February 2021). The MTA includes an analysis of the traffic operational effects of the project on the key intersections in the project area, an evaluation of EWPP conformance, a review of site access and on-site circulation, an evaluation of potential adverse effects on transit services and pedestrian and bicycle facilities, an evaluation of traffic effects on neighborhood streets, and a parking evaluation.

Because the project is consistent with and conforms to the land uses and development density of the EWPP, the project would not result in additional adverse traffic operational effects on intersection levels of service, freeway segment levels of service, and freeway ramp operations. Therefore, the MTA focuses on evaluating the project's traffic operational effects at intersections in the project vicinity under near-term conditions and identifies whether the project would contribute to the adverse intersection effects identified in the EWPP EIR.

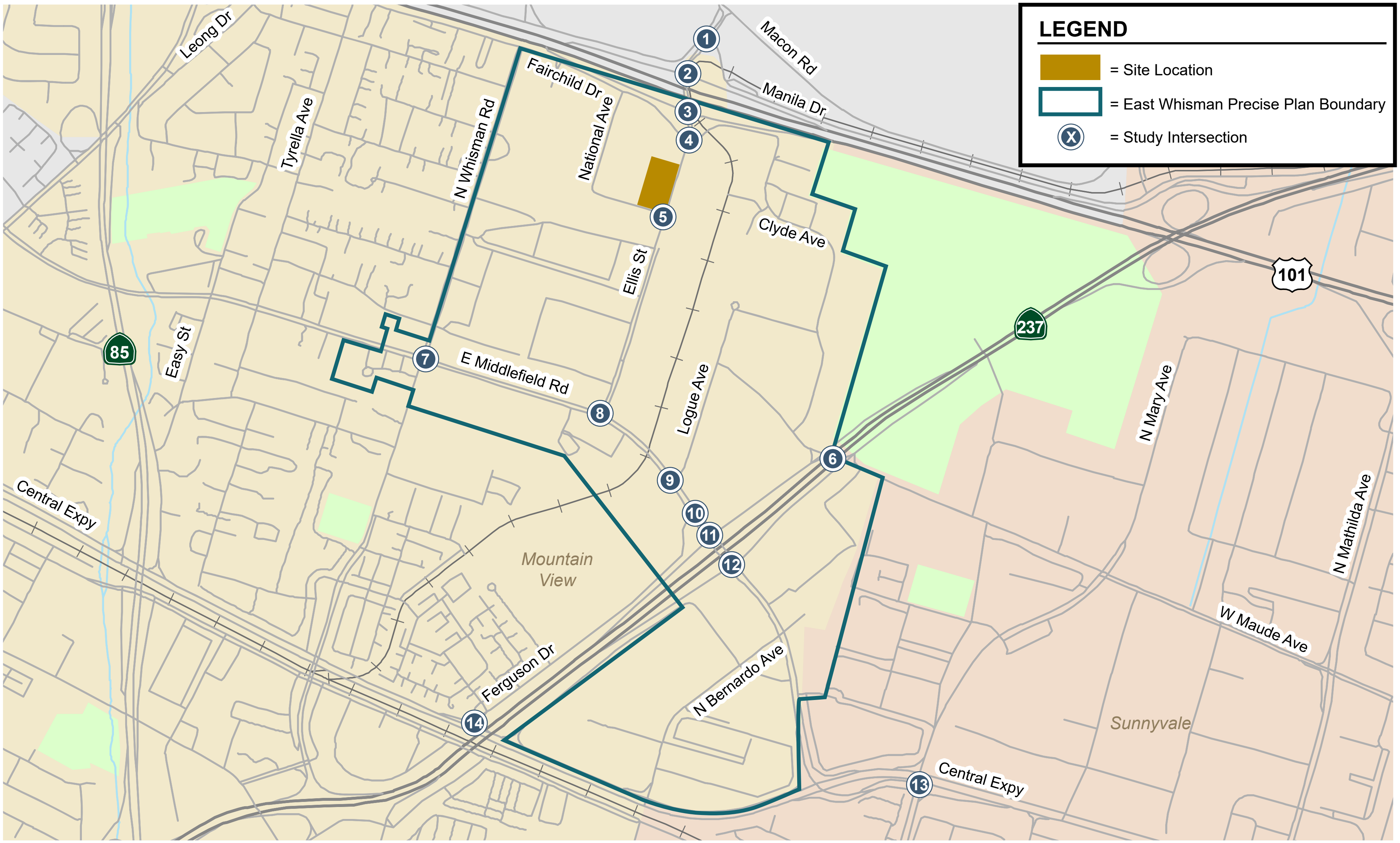

Figure 1
Site Location and Study Intersections

Hexagon

NORTH
Not to Scale

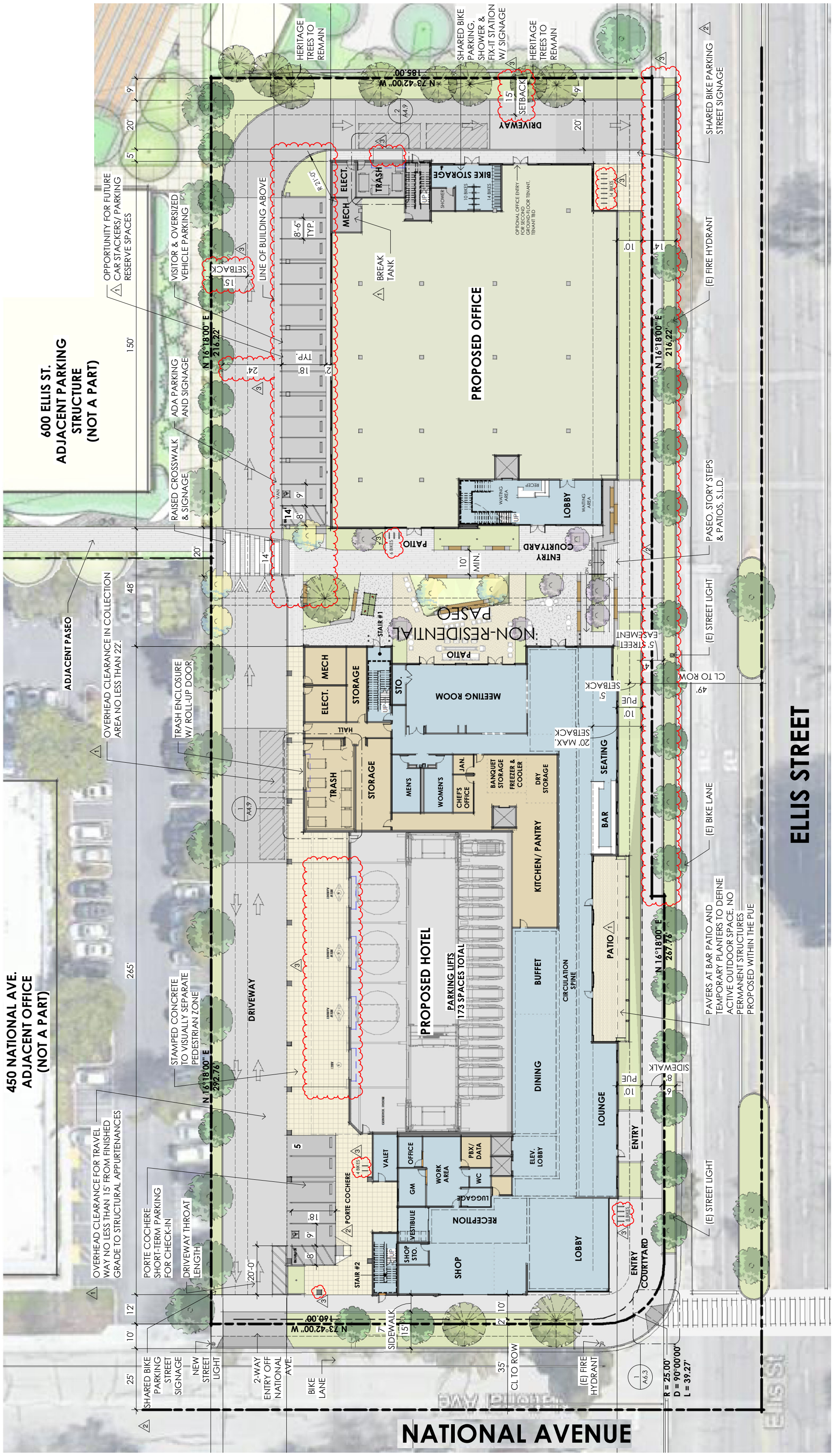

Figure 2
Proposed Site Plan

NORTH
Not to Scale

The study intersections were selected in accordance with the City's *MTA Handbook*, VTA's *Transportation Impact Analysis (TIA) Guidelines* (October 2014), and in consultation with Mountain View staff. The study includes those intersections that would experience a traffic increase of 10 or more peak-hour trips per lane. The study intersections are listed below and shown on Figure 1. Two study intersections are designated as CMP intersections.

1. Ellis Street and Manila Street (unsignalized)
2. Ellis Street and US 101 Northbound Ramps
3. Ellis Street and US 101 Southbound Ramps
4. Ellis Street and Fairchild Drive
5. Ellis Street and National Avenue (unsignalized)
6. SR 237 Ramps and Maude Avenue
7. Whisman Road and E. Middlefield Road
8. Ellis Street and E. Middlefield Road
9. Logue Avenue and E. Middlefield Road
10. Ferguson Drive and E. Middlefield Road
11. SR 237 Westbound Ramps and E. Middlefield Road
12. SR 237 Eastbound Ramps and E. Middlefield Road
13. Mary Avenue and Central Expressway (CMP)
14. Ferguson Drive and Central Expressway (CMP)

Traffic conditions at the study intersections were analyzed for the weekday AM and PM peak hours of traffic. Locally, the AM peak hour of traffic is usually between 7:00 and 10:00 AM, and the PM peak hour is typically between 4:00 and 7:00 PM. It is during these periods that the most congested traffic conditions occur on an average weekday.

Intersection traffic conditions were evaluated for the following scenarios:

- ***Existing Conditions.*** Existing AM and PM peak-hour traffic volumes were obtained from new turning-movement counts conducted in November 2022.

- ***Background Conditions*****.** Background traffic volumes were estimated by adding to existing traffic volumes the projected volumes from approved but not yet constructed developments in the vicinity of the project. The added traffic from approved but not yet constructed developments was based on the list of approved projects provided by the Cities of Mountain View and Sunnyvale***.***

- ***Background Plus Project Conditions.*** Background plus project traffic volumes were estimated by adding the additional traffic generated by the project. Background plus project conditions were evaluated relative to background conditions in order to determine potential project adverse effects.

The project is consistent with the EWPP and is covered by the EWPP EIR. Therefore, the MTA identifies the project-level traffic operational effects at the study intersections under background conditions. Cumulative effects of the project were evaluated in the EWPP EIR.

Intersection Operations Analysis Methodology

This section presents the methods used to determine traffic conditions at the study intersections. It includes descriptions of the data requirements, the analysis methodologies, and the applicable level of service standards.

Data Requirements

The data required for the analysis were obtained from new traffic counts, the Cities of Mountain View and Sunnyvale, Google Earth, and field observations. The following data were collected from these sources:

- Intersection traffic volumes,
- Lane geometries,
- Signal timing and phasing, and
- A list of approved but not yet constructed developments

Intersection Level of Service Analysis Methodologies and Standards

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.

Signalized Intersections

For signalized intersections, the level of service method evaluates intersection operations on the basis of average control delay time for all vehicles at the intersection based on the methodology described in the *2000 Highway Capacity Manual* (HCM). Table 1 presents the level of service definitions for signalized intersections.

This study utilizes the TRAFFIX software to determine intersection levels of service based on the 2000 HCM methodology. Since TRAFFIX is approved by VTA as the level of service analysis software for CMP signalized intersections, the City of Mountain View employs the CMP default values for the analysis parameters. TRAFFIX software was used to analyze intersection operations and intersection adverse effects based on the increases in critical-movement delay and the volume-to-capacity ratio (v/c) between no-project and project scenarios.

According to the City's *MTA Handbook*, the standard for signalized intersections is LOS D, except for CMP intersections and facilities, County Expressway intersections, and intersections in the Downtown and San Antonio Center planning areas, where the standard is LOS E. Therefore, the LOS D standard applies to the study intersections.

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

Level of Service	Description	Average Control Delay (seconds/vehicle)
A	Operations with very low delay occurring with favorable progression and/or short cycle lengths.	10.0 or less
B	Operations with low delay occurring with good progression and/or short cycle lengths.	10.1 to 20.0
C	Operations with average delays resulting from fair progression and/or longer cycle lengths. Individual cycle failures begin to appear.	20.1 to 35.0
D	Operations with longer delays due to a combination of unfavorable progression, long cycle lengths, and high volume-to-capacity (V/C) ratios. Many vehicles stop and individual cycle failures are noticeable.	35.1 to 55.0
E	Operations with high delays indicating poor progression, long cycle lengths, and high V/C ratios. Individual cycle failures are frequent occurrences.	55.1 to 80.0
F	Operations with delays unacceptable to most drivers occurring due to over-saturation, poor progression, or very long cycle lengths.	greater than 80.0

Source: Transportation Research Board, *2000 Highway Capacity Manual* (Washington, D.C., 2000), p.10-16.

Unsignalized Intersections

Level of service analysis at unsignalized intersections is generally used to determine the need for modifications in the type of intersection control (i.e., all-way stop or signalization). As part of the evaluation, traffic volumes, delays and traffic signal warrants are evaluated to determine if the existing intersection control is appropriate.

For unsignalized intersections, level of service depends on the average delay experienced by vehicles on the stop-controlled approaches. For side street stop-controlled intersections (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. The level of service is reported based on the average delay for the worst approach. For all-way stop-controlled intersections, the level of service is based on the average delay for all the intersection approaches. The level of service definitions for unsignalized intersections is shown in Table 2. This study utilizes the TRAFFIX software to determine intersection levels of service based on the *2000 HCM* methodology for unsignalized intersections.

The City of Mountain View does not have an adopted level of service standard for unsignalized intersections. However, the City strives to maintain LOS D for unsignalized intersections.

Table 2
Unsignalized Intersection Level of Service Definitions Based on Average 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, *2000 Highway Capacity Manual* (Washington, D.C., 2000) p17-2.

Intersection Vehicle Queuing Analysis

The analysis of intersection operations was supplemented with a vehicle queuing analysis at intersections where the project would add a substantial number of trips to the left-turn movements or stop-controlled approaches. The vehicle queuing analysis is used to determine the appropriate storage lengths for the high demand turn lanes where the project would add a substantial number of trips. Vehicle queues were estimated using a Poisson probability distribution, which estimates the probability of “n” vehicles for a vehicle movement using the following formula:

$$P(x=n) = \frac{\lambda^n e^{-(\lambda)}}{n!}$$

Where:

P (x=n) = probability of “n” vehicles in queue per lane
n = number of vehicles in the queue per lane
λ = average # of vehicles in the queue per lane (vehicles per hr per lane/signal cycles per hr)

The basis of the analysis is as follows: (1) the Poisson probability distribution is used to estimate the 95th percentile number of queued vehicles for a particular left-turn movement; (2) the estimated 95th percentile number of vehicles in the queue is translated into a queue length, assuming 25 feet per vehicle; and (3) the estimated 95th percentile queue length is compared to the existing or planned available storage capacity for the left-turn movement. This analysis thus provides a basis for estimating future turn pocket storage requirements at intersections.

For signalized intersections, the 95th percentile queue length value indicates that during the peak hour, a queue of this length or less would occur on 95 percent of the signal cycles, or a queue length larger than the 95th percentile queue would only occur on 5 percent of the signal cycles (about 3 cycles during the peak hour for a signal with a 60-second cycle length). Thus, turn pocket storage designs based on the 95th percentile queue length would ensure that storage space would be exceeded only 5 percent of the time for a signalized movement. Vehicle queuing at unsignalized intersections is evaluated based on the delay experienced by the specific study turn movement.

Definition of Adverse Intersection Operational Effects

Adverse operational effects at signalized intersections are based on the City of Mountain View level of service standards. For the unsignalized intersections, the City of Mountain View has applied adverse effect criteria in other traffic studies even though there is no formally adopted level of service policy for unsignalized intersections.

Signalized Intersections

According to the City of Mountain View level of service standards, a development is said to create an adverse operational effect on traffic conditions at a signalized intersection if for either peak hour, either of the following conditions occurs:

1. The level of service at the intersection drops below its respective level of service standard (LOS D or better for all local intersections in Mountain View and Sunnyvale and LOS E or better for CMP and expressway intersections) when project traffic is added, <u>or</u>

2. An intersection that operates below its level of service standard under no-project conditions experiences an increase in critical-movement delay of four (4) or more seconds, <u>and</u> an increase in critical volume-to-capacity ratio (v/c) of one percent (0.01) or more when project traffic is added.

The exception to this threshold is when the addition of project traffic reduces the amount of average control delay for critical movements, i.e., the change in average control delay for critical movements is negative. In this case, the threshold is when the project increases the critical v/c value by 0.01 or more.

Unsignalized Intersections

The project is said to create an adverse operational effect on traffic conditions at an unsignalized intersection in the City of Mountain View if for either peak hour:

1. The addition of project traffic causes the average intersection delay for all-way stop-controlled or the worst movement/approach for side-street stop-controlled intersections to degrade to LOS F, <u>and</u>

2. The intersection satisfies the *California Manual of Uniform Traffic Control Devices (CA MUTCD)* peak-hour volume signal warrant.

Report Organization

This report has a total of four chapters. Chapter 2 describes existing conditions including the existing roadway network, transit service, and bicycle and pedestrian facilities. Chapter 3 presents the vehicle operational analysis including the method by which project traffic is estimated, the project's traffic effects on the intersection operations, and a vehicle queuing analysis. Chapter 4 presents the analyses of other transportation-related issues, including conformance with the EWPP, site access and on-site circulation, potential effects on bicycle, pedestrian, and transit facilities, effects on surrounding neighborhood streets, and parking.

2.
Existing Transportation Conditions

This chapter describes the existing conditions for transportation facilities in the vicinity of the site, including the roadway network, transit services, pedestrian and bicycle facilities, and traffic operations at the study intersections.

Existing Roadway Network

Regional access to the project site is provided by US 101 and SR 237. Local access to the project site is provided via Whisman Road, Ellis Street, W. Middlefield Road, Maude Avenue, and National Avenue. For the purposes of this study, US 101, Middlefield Road, and all parallel streets are considered to run east-west, and cross streets, such as SR 237 and Ellis Street, are considered to run north-south.

US 101 is a freeway that extends through and beyond the Bay Area, connecting San Francisco to San Jose. US 101 is eight lanes wide with three mixed-flow lanes and one high-occupancy vehicle (HOV) lane in each direction in the vicinity of the project site. US 101 provides access to the project site via a full interchange at Ellis Street.

SR 237 is a four-lane to six-lane freeway within the vicinity of Sunnyvale that extends west to El Camino Real and east to I-880 in Milpitas. East of Mathilda Avenue, SR 237 has two mixed-flow lanes and one HOV lane in each direction. West of Mathilda Avenue, SR 237 has two mixed-flow lanes in each direction. SR 237 provides access to the project site via full interchanges at Maude Avenue and Middlefield Road.

Whisman Road is a north-south arterial between Fairchild Drive in the north and Dana Street in the south. Whisman Road has two lanes north of Middlefield Road with landscaped medians and left-turn pockets at intersections. South of Middlefield Road, Whisman Road is a four-lane road with landscaped medians beginning south of Pacific Drive. Bike lanes and sidewalks exist on both sides of the entire street. On-street parking is prohibited along both sides of the street south of Flynn Avenue. On-street parking is permitted along the west side of the street between Fairchild Drive and Flynn Avenue. The speed limit is 35 miles per hour (mph).

Ellis Street is a north-south four-lane arterial between Macon Road in the north and Middlefield Road in the south. Ellis Street has multiple landscaped medians and a two-way left turn lane at driveways with left turn pockets at intersections. Bike lanes exist along both sides of the street south of Fairchild Drive. Sidewalks exist along both sides of the street south of Fairchild Drive, except for a small segment just south of National Avenue. Sidewalks also exist along the west side of the street between Manila Avenue and Fairchild Drive. On-street parking is prohibited along both sides of the entire street. The posted speed limit is 40 mph. Ellis Street would provide outbound access from the project site.

Middlefield Road is a mostly east-west four-lane arterial that runs parallel to US 101. It begins at the intersection of Central Expressway in Mountain View and traverses north then westward through Redwood City. Middlefield Road has landscaped medians with left-turn pockets at intersections and has bike lanes and sidewalks on both sides of the street. The bike lanes on Middlefield Road between Thaddeus Drive and Whisman Road are part-time bike facilities that are used as bike lanes from 2 AM to 7 PM on weekdays and are used for on-street parking for the remaining hours (7 PM to 2 AM) and on weekends. The speed limit is 35 mph. Middlefield Road provides access to the project site via its intersection with Ellis Street.

Maude Avenue is an east-west arterial street between Logue Avenue in the west and Wolfe Road in the east. Maude Avenue has two lanes west of the SR 237 eastbound frontage road. Between the SR 237 eastbound frontage road and San Angelo Avenue, Maude Avenue has four lanes. Bike lanes exist along both sides of the street for the entire length. Sidewalks exist along both sides of the street except between the SR 237 westbound frontage road and Macara Avenue on the north side and between east of Logue Avenue and the SR 237 westbound frontage road on the south side. West of Clyde Avenue, on street parking is permitted along both sides of the street except between 2 AM and 6 AM. The posted speed limit is 25 mph between Logue Avenue and SR 237. The speed limit increases to 35 mph east of SR 237.

National Avenue is a two-lane local street between Fairchild Drive and Ellis Street. National Avenue runs in an east-west direction west of Ellis Street and then bends 90 degrees and ends at Fairchild Drive. Sidewalks exist along both sides of the street for most of the street, with a few segments of sidewalk gaps along the south and east sides of the street. On-street parking is permitted along both sides of the street except between 2 AM and 6 AM. The posted speed limit is 25 mph. National Avenue provides direct access to the project site.

Existing Transit Services

Existing public transit services in the study area are provided by the VTA and the Mountain View Transportation Management Association (TMA). VTA operates bus and light rail transit (LRT) services in Santa Clara County, and the TMA provides free MVgo shuttle service between the Mountain View Transit Center and corporate campuses in the North Bayshore and Whisman areas.

The VTA bus and LRT routes and MVgo shuttle routes in the project vicinity and the bus/shuttle stops near the project site are summarized in Table 3 and shown on Figure 3.

VTA Bus Service

VTA Local Route 21 serves the project area with bus stops in each direction on Middlefield Road and Logue Avenue. The bus stops closest to the project site are on Middlefield Road at Ellis Street, approximately 2,045 feet from the project site. Route 21 also stops at the Mountain View Transit Center, approximately 2.1 miles from the site. The Mountain View Transit Center provides connections to Caltrain, VTA LRT, several VTA bus routes (21, 40, and 52), MV Community Shuttle, and MVgo shuttle routes.

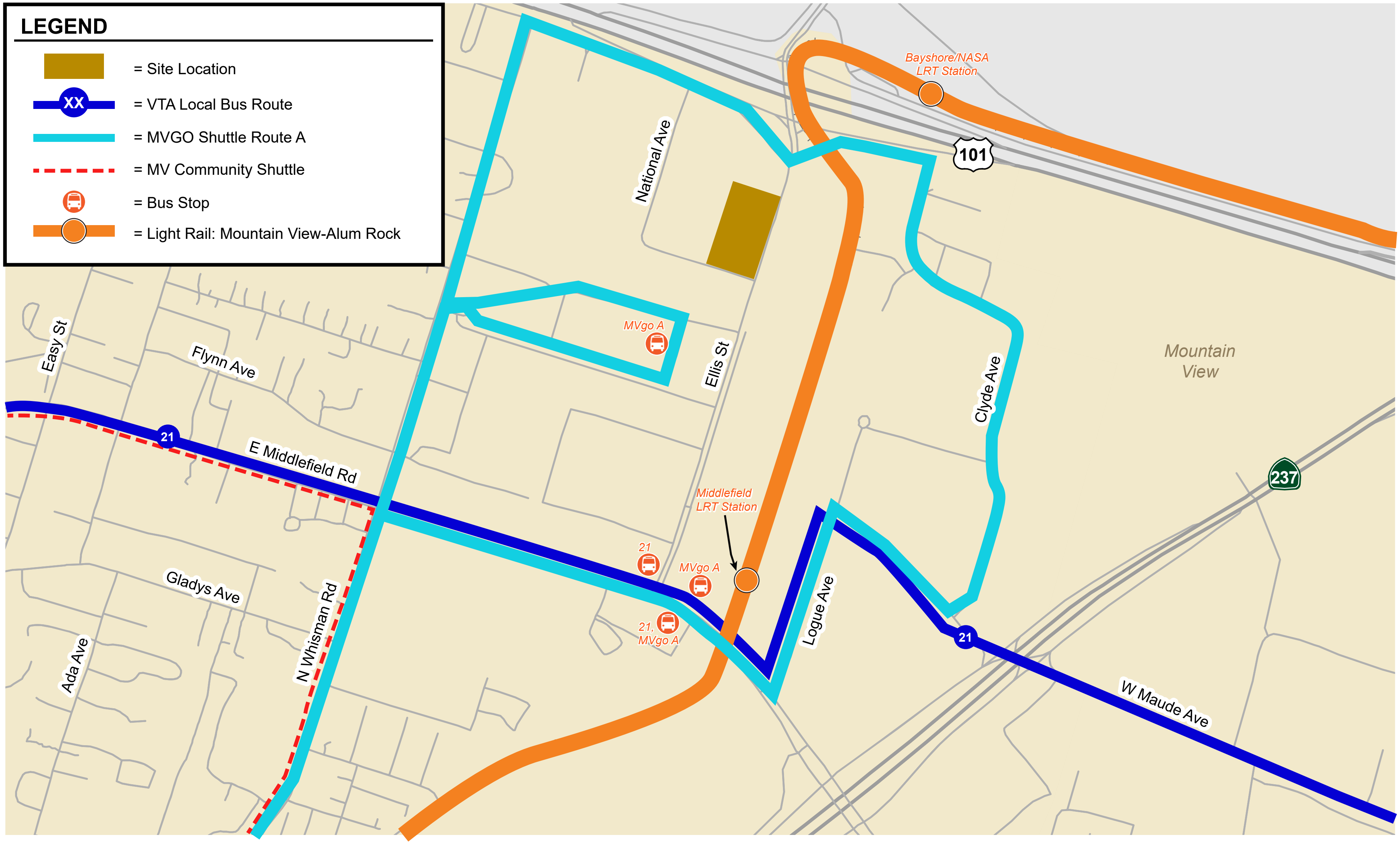

Figure 3
Existing Transit Services

Table 3
Existing Transit Services

Route	Route Description	Weekday Hours of Operation	Headways[1] (minutes)	Nearby Bus Stops	Walking Distance from Nearest Stop to Project Site (feet)
VTA Bus Route					
Local Route 21	Stanford Shopping Center - Santa Clara Transit Center	5:35 AM - 9:50 PM	30	Middlefield Road and Ellis Street	2,045
Mountain View Shuttle					
MVgo Shuttle[2] - Route A	Whisman, Clyde and Middlefield	7:05 AM - 10:36 AM 3:40 PM - 7:51 PM	30-40	468 Ellis Street (Google)	1,235
VTA Light Rail Transit					
LRT Orange Line	Mountain View - Alum Rock	5:05 AM - 12:44 AM (next day)	15	Bayshore/NASA LRT Station	1,775

Notes:
1. Headways during weekday peak periods as of December 2022.
2. Operated by Mountain View Transportation Management Association. It provides free transportation connections between Mountain View Transit Center and the Bayshore/Whisman areas.

Mountain View Transportation Management Association (TMA) Shuttles

The TMA operates the MVgo shuttle system. This shuttle system is provided through the collection of TMA member dues. MVgo operates four shuttle routes that provide service to employment areas from the Mountain View Transit Center. Three routes serve the North Bayshore area, and one route serves the N. Whisman area. The shuttles are timed to meet Caltrain arrivals during the AM and departures during PM commute periods. MVgo shuttle Route A provides service to the project area, with 6 buses in the morning, 7 buses in the afternoon, and a bus stop within the Google campus on Ellis Street, approximately 1,235 feet from the project site.

VTA Light Rail Transit (LRT)

The LRT Orange Line serves the project vicinity with the Bayshore/NASA LRT Station as the nearest stop to the project. The Bayshore/NASA LRT Station is approximately 1,775 feet from the project site. The Orange Line travels between the Mountain View Transit Center and Alum Rock.

Existing Pedestrian Facilities

Pedestrian facilities consist of sidewalks and crosswalks, which are present along most roadways in the project vicinity, and at signalized and unsignalized intersections. Pedestrian signal heads and push buttons are present at most of the signalized intersections in the project vicinity. A crosswalk is present along the north leg of the unsignalized study intersection of National Avenue and Ellis Street. Two enhanced midblock crosswalks with rapid rectangular flashing beacons (RRFB) exist on Ellis Street: in front of 464 Ellis Street and in front of 350 Ellis Street. Sidewalks are missing on the west side of Ellis Street just south of National Avenue and on the east side between Fairchild Drive and Manila Avenue. Crosswalks are missing across the US 101 northbound on-ramp, but there are pedestrian signal heads and push buttons for the crossing. There is a crosswalk on the north leg of the Ellis Street/Manila Avenue intersection. Between the project site and the Bayshore/NASA LRT Station, pedestrians would have continuous sidewalks along the west side of Ellis and north side of Manila Drive. A multi-use path runs along the west side of the Middlefield LRT Station, which connects to Ellis Street through pedestrian walkways.

Within a typical walking distance (a half mile or 10 minutes), pedestrian facilities are mostly present between the project and the surrounding land uses, including bus stops and offices in the area. However, continuous sidewalks across a long street block are not equivalent to good pedestrian connectivity. In addition, long distances (wider roads), heavier traffic volumes, and high posted speed limits discourage pedestrian activity. The street network in the project area consists of long blocks: between Ellis Street and Logue Avenue and between Middlefield Road and Maude Avenue.

The pedestrian counts at the study intersections indicated that the total number of pedestrians crossing Middlefield Road is relatively high at Whisman Road during the peak commute hours, 41 pedestrians in the AM peak hour and 23 pedestrians in the PM peak hour. The intersection is signalized with pedestrian signal heads and push buttons. The other study intersections had relatively low pedestrian activity during either peak hour.

Existing Bicycle Facilities

The bicycle facilities that exist within one mile of the project site (see Figure 4) include a multi-use trail (Class I bikeway), striped bike lanes (Class II bikeway) and shared bike routes/boulevards (Class III bikeway). Bike paths or multi-use trails are shared between pedestrians and bicyclists and separated from motor vehicle traffic. Bike lanes are lanes on roadways designated for use by bicycles with special lane markings, pavement legends, and signage. Bike routes are signed bike routes where bicyclists share a travel lane with motorists.

The Hetch Hetchy Trail extends from N. Whisman Road and connects to the Stevens Creek Trail. The trail can be accessed from Whisman Road, approximately 0.5 mile from the project site. There is a segment of a multi-use trail that connects Ellis Street and Whisman Road, opposite the Hetch-Hetchy trail head on Whisman Road. There is also a multi-use paseo between 620 National Avenue and 545 N. Whisman Road that connects National Avenue and Whisman Road to the bike lanes on Whisman Road and to the Hetch-Hetchy Trail.

The Stevens Creek Trail extends from the Bay, under US 101 and Middlefield Road, and ends at Dale Avenue/Heatherstone Avenue. The trail can be accessed from a point on Easy Street at the Gladys Avenue intersection, from the sidewalk on the south side of Middlefield Road, or from the Hetch Hetchy Trail.

A multi-use path exists along the west side of the LRT tracks between 475 Ellis Street, across Middlefield Road, into the South Whisman and Whisman Station neighborhoods. The path can be accessed from Ellis Street through pedestrian walkways that run between Ellis Street and the Middlefield LRT Station. The path could also be accessed by Middlefield Road. It should be noted that no crosswalk exists on Middlefield Road to connect the existing multi-use path north and south.

Striped bike lanes are present along the following street segments:

- Logue Avenue between Middlefield Road and Maude Avenue
- Maude Avenue, for the entire street
- Middlefield Road, between Old Middlefield Way and Bernardo Avenue
- Whisman Road, for the entire street
- Ellis Street, south of Fairchild Drive
- Clyde Avenue, for the entire street

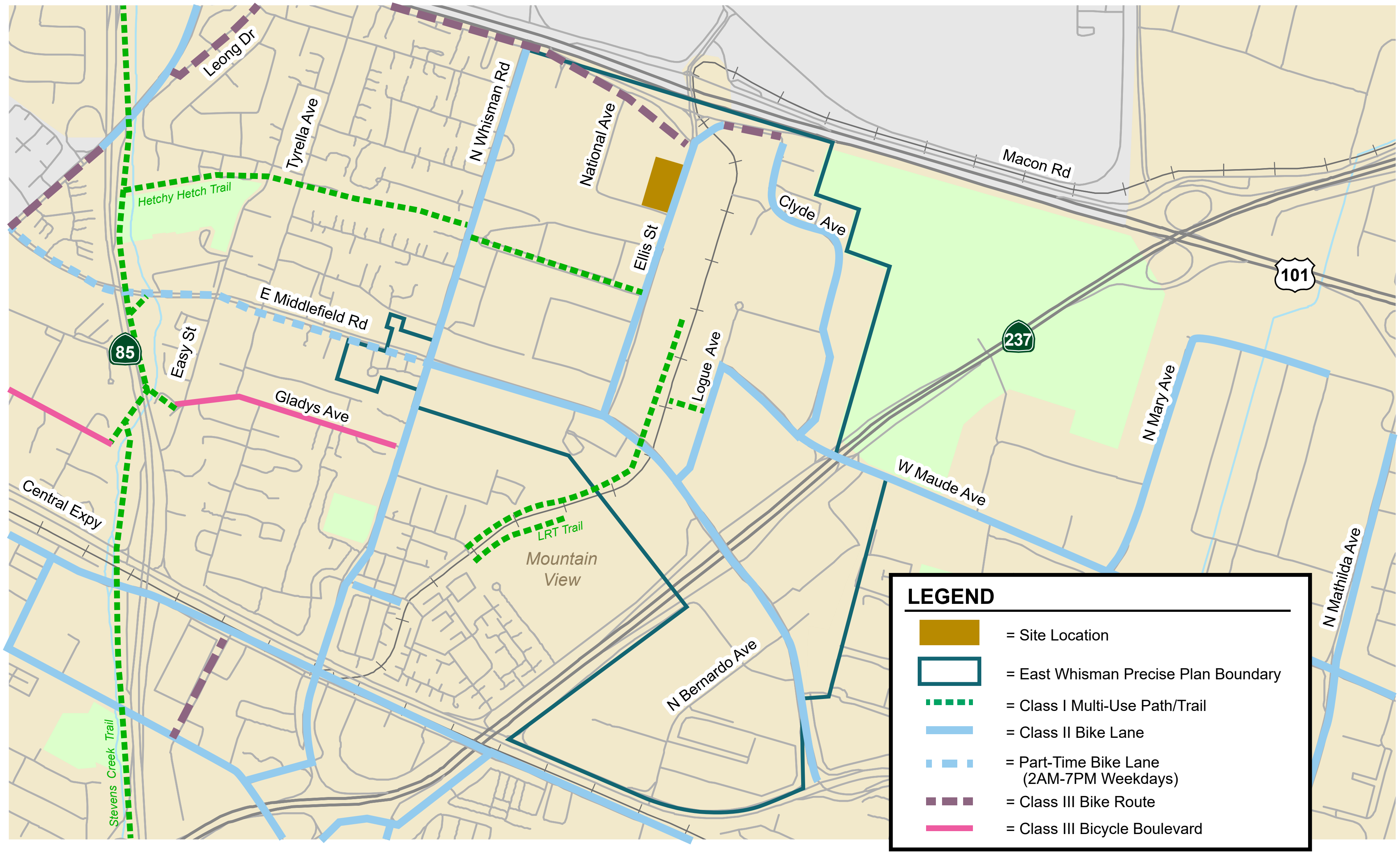

Figure 4
Existing Bicycle Facilities

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Some of these streets, while having bike lanes, are more suitable for experienced riders because of the traffic speed. The bike lanes on Middlefield Road between Thaddeus Drive and Whisman Road are part-time bike facilities that are used as bike lanes from 2 AM to 7 PM on weekdays and are used for on-street parking for the remaining hours (7 PM to 2 AM) and on weekends. Because the bike lanes are available only on weekdays, they are primarily suited to bicycle commuters and not to casual riders.

The bicycle counts at the study intersections indicated that bicycle traffic was moderate on Ellis Street and W. Middlefield Road during the peak commute hours. Between Manila Avenue and Fairchild Drive on Ellis Street, there were 31 northbound bicycles in the AM peak hour and 29 southbound bicycles in the PM peak hour. During the AM peak hour, there were 21 eastbound bicycles along W. Middlefield Road between Ellis Street and Logue Avenue. The other study intersections had relatively low bicycle activity traveling through the intersection from all directions during either peak hour.

Bike routes are typically designated with sharrows (shared-lane pavement markings), and bikes may take the travel lane. Bike routes are appropriate for low-volume streets with slow travel speeds, especially those on which motorist volumes are low enough that passing maneuvers can use the full street width; on roadways with bicycle demand but without adequate space for bike lanes; and as “gap fillers” where there are short breaks in bike lanes due to right-of-way constraints. The City’s Bike Map shows Leong Drive and Fairchild Drive are designated as existing bike routes. However, there are no signs or sharrows on either street to indicate a bike route.

Similar to the pedestrian facilities, continuous bike facilities are not equivalent to good bike connectivity. As discussed in Chapter 4, the project would improve the connectivity to the existing bicycle paths.

Existing Lane Configurations and Traffic Volumes

The existing lane configurations at the study intersections were obtained from field observations (see Figure 5).

Existing traffic volumes were obtained from turning movement counts collected during typical weekdays on November 15, 2022, between 7:00 and 10:00 AM and between 4:00 and 7:00 PM. The existing peak-hour intersection volumes are shown in Figure 6. The intersection turning-movement counts conducted for this analysis are presented in Appendix A.

Existing Intersection Levels of Service

The results of the intersection level of service analysis show that all the study intersections currently are operating at acceptable levels of service (see Table 4). The intersection level of service calculation sheets for the project are included in Appendix B.

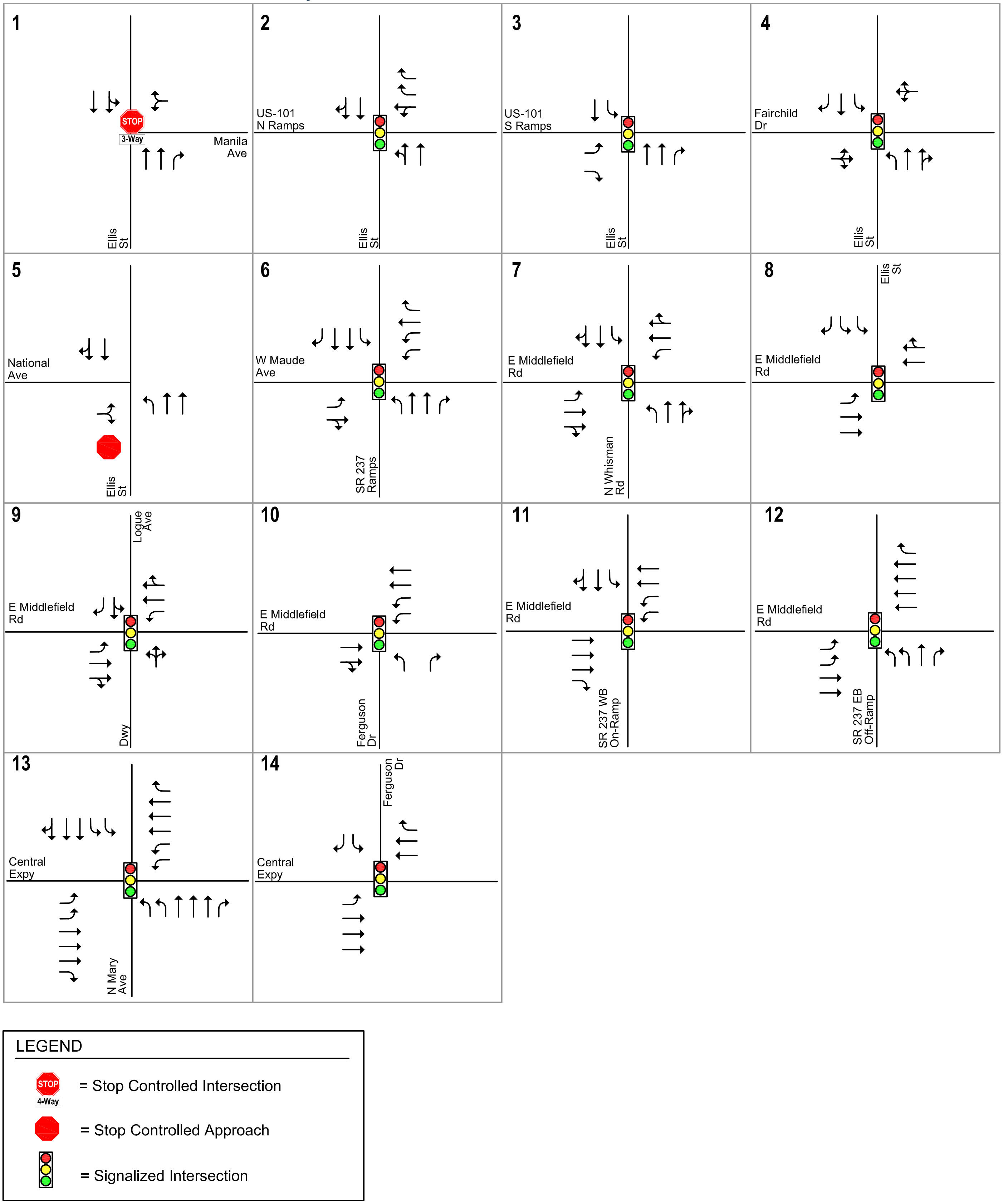
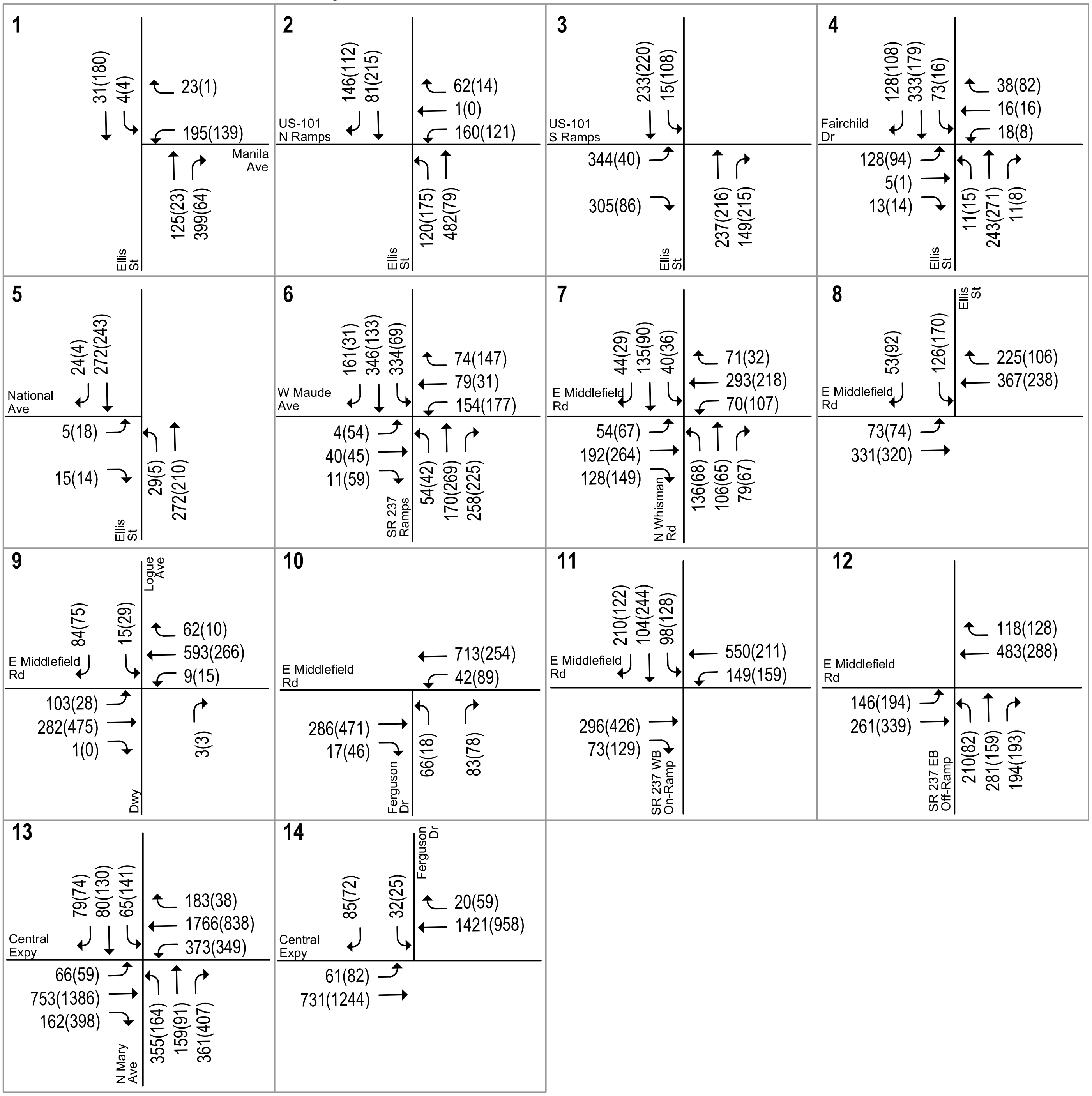


Figure 5
Existing Lane Configurations



LEGEND

XX(XX) = AM(PM) Peak-Hour Traffic Volumes

Figure 6
Existing Traffic Volumes

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Table 4
Existing Intersection Levels of Service

ID	Intersection	LOS Standard	Peak Hour	Count Date	Existing Avg. Delay[1]	Existing LOS
1	Ellis St and Manila Dr	D	AM	11/15/22	10.4	B
	(all-way stop)		PM	11/15/22	8.3	A
2	Ellis St and US 101 NB Ramps	D	AM	11/15/22	12.4	B
			PM	11/15/22	19.2	B
3	Ellis St and US 101 SB Ramps	D	AM	11/15/22	12.9	B
			PM	11/15/22	10.6	B
4	Ellis St and Fairchild Dr	D	AM	11/15/22	14.5	B
			PM	11/15/22	12.6	B
5	Ellis St and National Ave	D	AM	11/15/22	10.0	A
	(one-way stop)		PM	11/15/22	10.3	B
6	SR 237 Ramps and Maude Ave	D	AM	11/15/22	41.8	D
			PM	11/15/22	37.8	D
7	Whisman Rd and Middlefield Rd	D	AM	11/15/22	26.3	C
			PM	11/15/22	29.2	C
8	Ellis St and Middlefield Rd	D	AM	11/15/22	12.6	B
			PM	11/15/22	18.1	B
9	Logue Ave and Middlefield Rd	D	AM	11/15/22	15.2	B
			PM	11/15/22	14.4	B
10	Ferguson Dr and Middlefield Rd	D	AM	11/15/22	11.8	B
			PM	11/15/22	8.9	A
11	SR 237 WB Ramps and Middlefield Rd	D	AM	11/15/22	20.9	C
			PM	11/15/22	22.9	C
12	SR 237 EB Ramps and Middlefield Rd	D	AM	11/15/22	20.8	C
			PM	11/15/22	21.3	C
13	Mary Ave and Central Expy*	E	AM	11/15/22	42.7	D
			PM	11/15/22	47.9	D
14	Ferguson Dr and Central Expy*	E	AM	11/15/22	4.4	A
			PM	11/15/22	5.0	A

Notes:
* Denotes VTA CMP intersection
1. Weighted average control delay measured in seconds per vehicle for signalized and all-way stop intersections. Worst approach delay (seconds per vehicle) and LOS are reported for side stop-controlled intersections.

3.
Intersection Operational Analysis

This chapter presents the vehicle traffic operational analysis including the method by which project traffic is estimated, the results of intersection level of service analysis for background and background plus project, any adverse effects to intersection level of service caused by the project, and an intersection vehicle queuing analysis. A potential adverse operational effect on a study intersection is not considered a CEQA impact.

Project Trip Estimates

The magnitude of traffic produced by a new development and the locations where that traffic would appear were 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 traveling to and from the proposed project was estimated for the AM and PM peak hours. As part of the project trip distribution, the directions to and from which the project trips would travel were estimated. In the project trip assignment, the project trips were assigned to specific streets and intersections. These procedures are described below.

Trip Generation

Through empirical research, data have been collected that show trip generation rates for many types of land uses. The data are published in the Institute of Transportation Engineers' (ITE) manual entitled *Trip Generation Manual*, 11th Edition. 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. Trip generation estimates for the project are based on standard trip generation rates published in the ITE *Trip Generation Manual* and the trip caps for new office developments in the EWPP area.

A description of the source of trip generation rates for each proposed land use is provided below:

- ***Office.*** Trips that would be generated by the proposed office were estimated based on the daily trip rate and peak-hour trip cap rates for new office developments in the EWPP area. The trip cap rates were determined through the transportation analysis for the 465 Fairchild Drive/600 Ellis Street office project at 0.83 trips per 1,000 square feet (ksf) during the AM peak hour and

0.72 trips per ksf during the PM peak hour, which is inclusive of TDM measures required by the EWPP[1].

- ***Hotel.*** Trips that would be generated by the proposed hotel were estimated based on ITE trip rates for "Business Hotel" (Land Use 312). The "Business Hotel" category refers to a place of lodging aimed toward the business traveler that provides sleeping accommodations and limited facilities, such as a breakfast buffet bar and limited meeting rooms. A business hotel is more relevant to the project than a full-service hotel (Land Use 310) as business hotels do not always include amenities that would be included in a full-service hotel, such as a full-service staff, a sit-down restaurant, or full access meeting facilities. However, a business hotel could provide some of these amenities.

Existing Trip Credits

Because the project would demolish the existing office buildings on the site, trips associated with the existing buildings were subtracted from the gross project traffic to derive the net project trips. AM and PM peak-hour driveway counts were conducted on November 3, 2022, to determine the trips currently generated by the existing office buildings on site. Although more employees are working remotely or with flexible schedules than employees under typical pre-COVID conditions, the building is fully occupied.

Net Project Trips

Based on the ITE trip generation rates and existing development reductions, it is estimated that the proposed project would generate 1,072 net new daily trips, with 115 trips (64 inbound and 51 outbound) occurring during the AM peak hour and 88 trips (46 inbound and 42 outbound) occurring during the PM peak hour (see Table 5).

[1] The EWPP identifies an area-wide average trip cap of 0.95 a.m. and 0.88 p.m. peak-hour trips per ksf of office and R&D sites to minimize vehicle trips into and out of East Whisman gateways. The 465 Fairchild Dr/600 Ellis Street Office Project transportation analysis, prepared by Fehr Peers dated September 2020, analyzed the combination of existing (legacy) office development not subject to TDM requirements and future new office development that will be subject to TDM requirements in order to refine the trip generation rate necessary for future new office development to be compliant with the gateway trip cap volumes. The resulting trip cap for new office development is 0.83 a.m. and 0.72 p.m., which includes the incorporation of TDM measures required by the EWPP.

Table 5
Project Trip Generation Estimates

			Daily		AM Peak Hour				PM Peak Hour			
			Trip		Trip	Trips			Trip	Trips		
Land Use	Size		Rate	Trips	Rate	In	Out	Total	Rate	In	Out	Total
Proposed Use												
Office[1]	37.611	ksf	5.25	197	0.83	27	4	31	0.72	5	22	27
Hotel[2]	201	rooms	5.08	1,021	0.51	54	49	103	0.41	46	36	82
Gross Proposed Trips				***1,218***		***81***	***53***	***134***		***51***	***58***	***109***
Existing Use												
Office[3]	32.734	ksf		146		17	2	19		5	16	21
Net Project Trips				**1,072**		**64**	**51**	**115**		**46**	**42**	**88**

Source: ITE Trip Generation Manual, 11th Edition, 2021.
1. Daily and AM and PM peak-hour trip cap rates (in trips per 1,000 s.f.) developed for office developments in EWPP were used.
2. Business Hotel (ITE Land Use 312): average trip rates in trips per occupied room were used.
3. AM and PM peak-hour trips were based on the driveway counts conducted on November 3, 2022. Daily trips were estimated based on the average ratio of ITE daily to AM and PM peak-hour trip rates for office use (ITE Land Use 710).

Trip Distribution and Assignment

The trip distribution for the project was estimated based on existing travel patterns on the surrounding roadway network and the locations of complementary land uses (see Figure 7). The peak-hour trips generated by the proposed hotel and office were assigned to the roadway system based on the directions of approach and departure, the roadway network connections, and the location of project driveways (see Figure 8).

Roadway Network

The roadway network under background and background plus project conditions would be the same as existing conditions because there are no planned and funded transportation improvements at the study intersections that would alter the existing intersection lane configurations, and the project would not alter the existing intersection lane configurations.

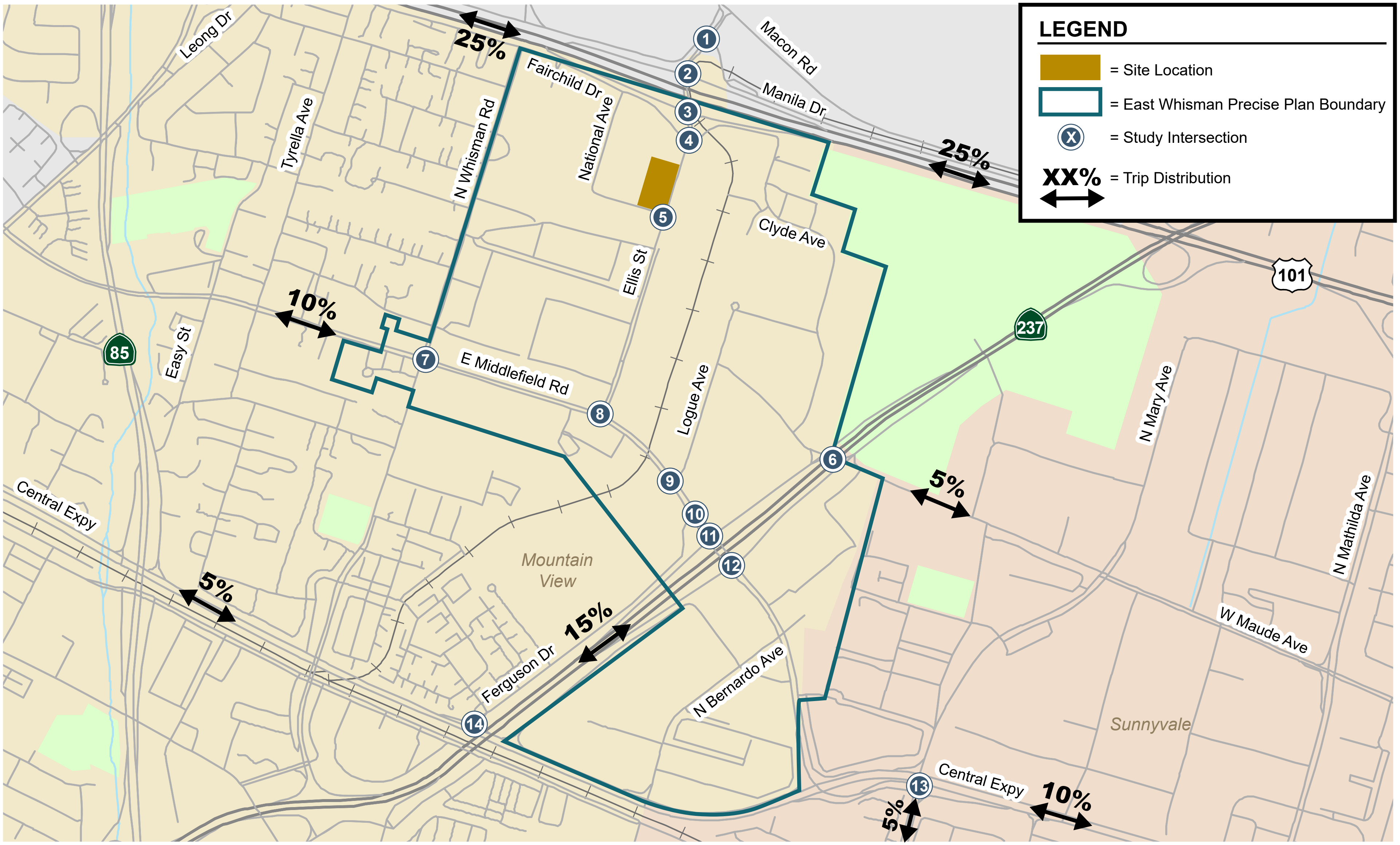
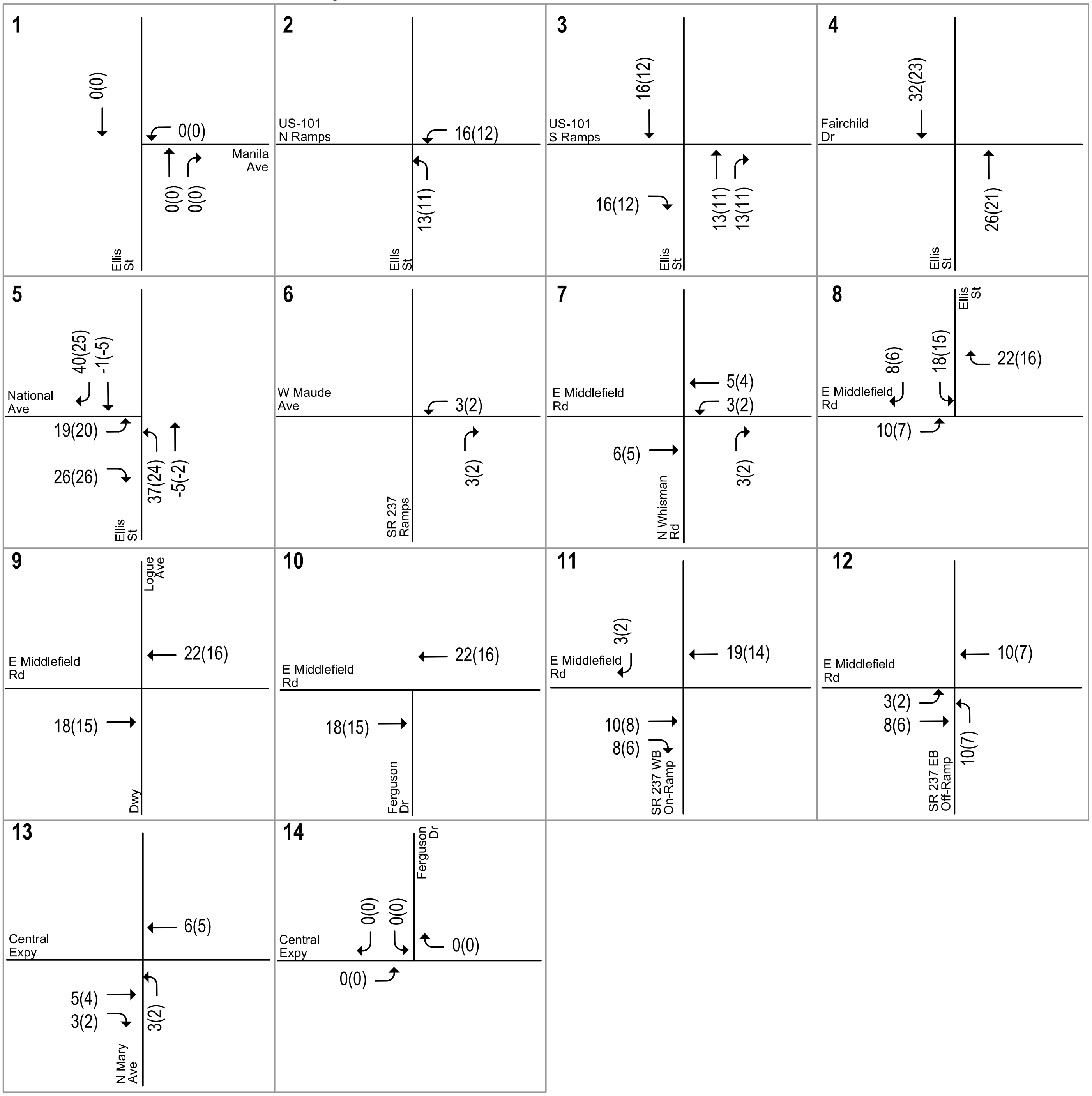


Figure 7
Project Trip Distribution



LEGEND

XX(XX) = AM(PM) Peak-Hour Trips

Figure 8
Project Trip Assignment

Traffic Volumes

Background Traffic Volumes

Background traffic volumes for the study intersections (see Figure 9) were estimated by adding to the existing traffic volumes the trips generated by nearby approved projects that have not been constructed or occupied.

Lists of approved projects were obtained from the Cities of Mountain View and Sunnyvale. Hexagon considered both the location and size of the approved projects in order to eliminate those that were too far away or too small to affect traffic conditions of the study intersections. The approved projects considered for the study are listed in Appendix C. Vehicle trips from the approved projects were obtained from the project's TIA or environmental document (Initial Study or EIR), if available. For projects without a traffic study, trip estimates were developed using rates published in the *Trip Generation Manual*. The estimated trips were assigned to the study intersections according to distributions identified in the development traffic studies, if available, or knowledge of the study area.

The approved trips and traffic volumes for all components of traffic are tabulated in Appendix C.

Background Plus Project Traffic Volumes

Project trips, as represented in the above project trip assignment, were added to background traffic volumes to obtain background plus project traffic volumes (see Figure 10).

Intersection Levels of Service

The results of the intersection level of service analysis (see Table 6) show that all study intersections would operate at acceptable levels during both the AM and PM peak hours of traffic under background conditions, with and without the project. The critical delay and v/c increase for unsignalized intersections are not calculated, as these values only determine the adverse effect at signalized intersections. The intersection level of service calculation sheets for the project are included in Appendix B.

There are some signalized intersections for which the average delay under project conditions is shown to be less than under no project conditions during at least one peak hour. The decrease in average delay can be less under project conditions 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 can reduce the average delay for the entire intersection. There are also several signalized intersections at which there would be no increase in critical delay and/or critical v/c compared to no project conditions. This is because the project trips are assigned to the non-critical movements of these intersections.

Based on the EWPP, the Ellis Street/Manila Avenue, Whisman Road/Middlefield Road, Middlefield Road/SR 237 Ramps, and Ferguson Drive/Central Expressway intersections are considered trip monitoring gateways, while the Ellis Street/US 101 Northbound Ramps, Ellis Street/US 101 Southbound Ramps, SR 237 Ramps/Maude Avenue, and Mary Avenue/Central Expressway intersections are considered trip target gateways. The monitoring gateways would be monitored over time to address unforeseen congestion impacts, and the trip target gateways are intersections that would be more likely to trigger congestion impacts. The results of the intersection level of service analysis show that the project is not expected to cause adverse effects at any of the trip target and monitoring gateway intersections.

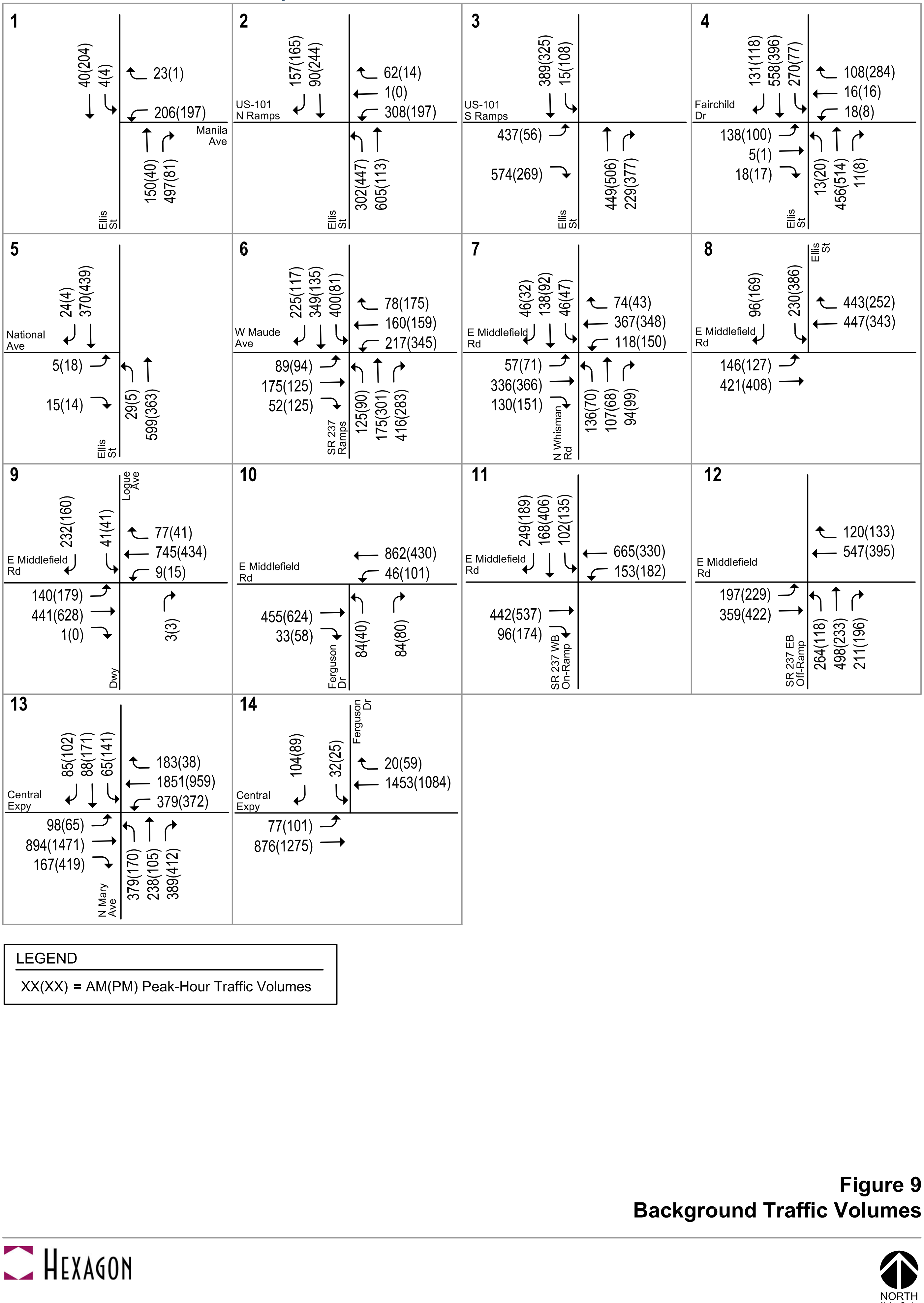
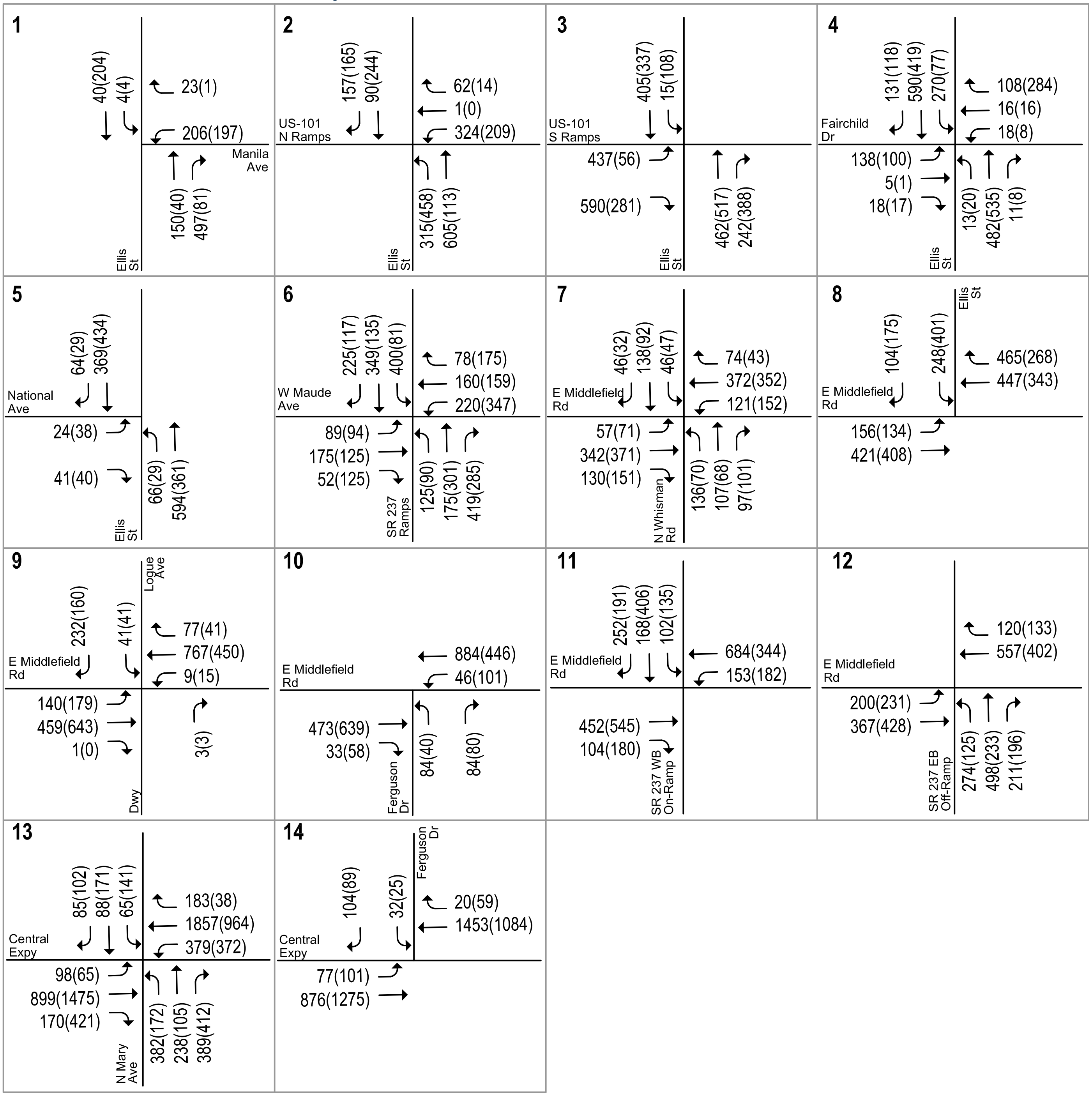


Figure 9
Background Traffic Volumes



LEGEND

XX(XX) = AM(PM) Peak-Hour Traffic Volumes

Figure 10
Background Plus Project Traffic Volumes

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Table 6
Background Plus Project Intersection Levels of Service

ID	Intersection	LOS Standard	Peak Hour	Background Avg. Delay[1]	Background LOS	Background+Project Avg. Delay[1]	Background+Project LOS	Incr. In Crit. Delay	Incr. In Crit. V/C
1	Ellis St and Manila Dr	D	AM	12.2	B	12.2	B	--	--
	(all-way stop)		PM	8.8	A	8.8	A	--	--
2	Ellis St and US 101 NB Ramps	D	AM	14.6	B	14.9	B	0.3	0.015
			PM	20.1	C	20.4	C	0.3	0.014
3	Ellis St and US 101 SB Ramps	D	AM	15.7	B	16.1	B	0.7	0.020
			PM	16.2	B	17.3	B	2.6	0.008
4	Ellis St and Fairchild Dr	D	AM	15.7	B	15.7	B	0.0	0.019
			PM	14.8	B	14.9	B	0.2	0.015
5	Ellis St and National Ave	D	AM	11.1	B	13.4	B	--	--
	(one-way stop)		PM	12.3	B	13.3	B	--	--
6	SR 237 Ramps and Maude Ave	D	AM	53.6	D	53.6	D	0.1	0.002
			PM	39.5	D	39.5	D	0.0	0.001
7	Whisman Rd and Middlefield Rd	D	AM	26.4	C	26.4	C	0.0	0.004
			PM	29.0	C	29.0	C	0.1	0.004
8	Ellis St and Middlefield Rd	D	AM	15.9	B	16.4	B	0.5	0.034
			PM	21.2	C	21.5	C	0.3	0.014
9	Logue Ave and Middlefield Rd	D	AM	20.2	C	20.0	C	-0.1	0.007
			PM	19.5	B	19.3	B	-0.1	0.004
10	Ferguson Dr and Middlefield Rd	D	AM	10.8	B	10.7	B	-0.1	0.006
			PM	8.6	A	8.6	A	0.0	0.005
11	SR 237 WB Ramps and Middlefield Rd	D	AM	20.8	C	20.8	C	0.0	0.004
			PM	23.1	C	23.3	C	1.4	-0.004
12	SR 237 EB Ramps and Middlefield Rd	D	AM	21.7	C	21.7	C	0.1	0.003
			PM	21.8	C	21.8	C	0.0	0.001
13	Mary Ave and Central Expy*	E	AM	44.0	D	44.0	D	0.0	0.002
			PM	48.5	D	48.6	D	0.0	0.001
14	Ferguson Dr and Central Expy*	E	AM	4.4	A	4.4	A	0.0	0.000
			PM	5.5	A	5.5	A	0.0	0.000

Notes:
* Denotes VTA CMP intersection.
1. Weighted average control delay measured in seconds per vehicle for signalized and all-way stop intersections. Worst approach delay (seconds per vehicle) and LOS are reported for side stop-controlled intersections.

Intersection Queuing Analysis

The analysis of intersection operations was supplemented with a vehicle queuing analysis for intersections where the project would add a substantial number of trips to the left-turn movements or stop-controlled movements. This analysis provides a basis for estimating future storage requirements at the intersections under existing, background, and project conditions. Vehicle queues were estimated using a Poisson probability distribution, described in Chapter 1. The following left-turn movements were evaluated, and the results of the queueing analysis are summarized in Table 7:

- Eastbound left turn from Middlefield Road to Ellis Street
- Northbound left turn and eastbound movements at Ellis Street and National Avenue

The queuing analysis indicates that there would be no queuing deficiencies caused or exacerbated by the project. The queueing analysis indicates that under background conditions, the eastbound left-turn movement from Middlefield Road to Ellis Street would exceed the storage length during both the AM and PM peak hours, but the project is not expected to further increase the 95th percentile queues.

The EWPP EIR identifies the need for an improvement at this intersection, specifically along the eastbound direction to improve queuing. The EIR recommends adding a 2nd eastbound left-turn lane with overlap signal phasing. This intersection is included in the EWPP Development Impact Fee. The project would contribute to the improvement at the intersection by paying the EWPP Development Impact Fee.

Table 7
Intersection Queuing Analysis Summary

	Ellis St & Middlefield Rd		Ellis St & National Ave			
	EBL		NBL		EBL/T/R[3]	
Analysis Scenario	AM	PM	AM	PM	AM	PM
Existing						
Cycle/Delay[1] (sec)	90	100	7.9	7.7	10.0	10.3
Volume (vphpl)	73	74	29	5	20	32
95th %. Queue (veh/ln)	4	5	1	1	1	1
95th %. Queue[2] (ft/ln)	100	125	25	25	25	25
Storage (ft/ln)	125	125	75	75	150	150
Adequate (Y/N)	Y	Y	Y	Y	Y	Y
Background						
Cycle/Delay[1] (sec)	90	100	8.1	8.2	11.1	12.3
Volume (vphpl)	146	127	29	5	20	32
95th %. Queue (veh/ln)	7	7	1	1	1	1
95th %. Queue[2] (ft/ln)	175	175	25	25	25	25
Storage (ft/ln)	125	125	75	75	150	150
Adequate (Y/N)	**N**	**N**	Y	Y	Y	Y
Background Plus Project						
Cycle/Delay[1] (sec)	90	100	8.4	8.3	13.4	13.3
Volume (vphpl)	156	134	66	29	65	78
95th %. Queue (veh/ln)	7	7	1	1	1	1
95th %. Queue[2] (ft/ln)	175	175	25	25	25	25
Storage (ft/ln)	125	125	75	75	150	150
Adequate (Y/N)	**N**	**N**	Y	Y	Y	Y

Notes:
NB = northbound; EB = eastbound; L/T/R = left/through/right.
1 Cycle length used for signalized intersections, delay of movement used for unsignalized intersections
2 Assumes 25 feet per vehicle queued.
3 Storage length measured from intersection to existing/project driveway.

Signal Warrant Analysis At Ellis Street and National Avenue

Traffic operations at the unsignalized Ellis Street/National Avenue intersection were also analyzed on the basis of the Peak-Hour Volume Signal Warrant, (Warrant #3) described in *the California Manual on Uniform Traffic Control Devices (MUTCD)*, 2014 Edition. This method makes no evaluation of intersection level of service, but simply provides an indication whether peak-hour traffic volumes are, or would be, sufficient to justify installation of a traffic signal. The results of peak-hour volume signal warrant analysis indicate that the Ellis Street/National Avenue intersection would not meet the thresholds that warrant signalization under either existing or background conditions during both AM and PM peak hours. The peak-hour signal warrant sheet is contained in Appendix E.

Stop Warrant Analysis At Ellis Street and National Avenue

A potential all-way stop at the Ellis Street and National Avenue intersection was evaluated under existing, background, and background plus project conditions, based on the criteria described in the City's stop warrant analysis worksheet. The criteria are as follows:

I. **Volume Warrant:** The vehicular volume entering the intersection from all approaches is at least 300 vehicles per hour for the highest 8 hours of an average day, AND the combined vehicular volume entering the intersection from the minor street approaches is at least 100 vehicles per hour for the same 8 hours.

   OR

   The vehicular volume entering the intersection from all approaches is at least 300 vehicles per hour for the highest 8 hours of an average day, AND the total pedestrian volume entering the intersection is at least 100 pedestrians per hour for the same 8 hours.

   If the intersection is located in a residential area, the above volume thresholds are decreased by 40%.

II. **Crash Warrant:** 3 or more reported crashes/collisions in a 12-month period.

III. **Line of Sight Warrant:** 150 feet or less line of sight distance on one or more approaches of the major street.

An intersection qualifies as a residential area if ALL of the following conditions exist:

- Both streets have residential frontage and have a 25 mph speed limit.
- Neither street is an adopted through street as defined in the CVC (California Vehicle Code).
- Neither street has more than one travel lane in each direction.
- No stop sign or traffic signal exists within 500 feet along the major street.
- The installation of a 4-way stop sign is compatible with overall traffic circulation.

The Ellis Street/National Avenue intersection does not qualify as a residential area because both streets do not have a residential frontage.

Based on the City's stop warrant criteria, the intersection would not meet any of the three warrants under any scenario. The stop warrant analysis worksheets are included in Appendix E.

CMP Intersection Conformance

With the project, both of the study CMP intersections (Mary Avenue/Central Expressway and Ferguson Drive/Central Expressway) would operate adequately (LOS E or better). The project would add a maximum of 6 trips per lane during either the AM or PM peak hour, which would meet the 10 trips per lane guideline for CMP analysis. Thus, the project is not expected to result in additional adverse traffic operational effects on the other CMP study intersections analyzed in the EWPP EIR. The EWPP EIR studied CMP intersections along Central Expressway between Shoreline Boulevard and Mathilda Avenue, along SR 237 between El Camino Real and Grant Road, and at Maude Avenue/Mathilda Avenue. The project is not expected to add more than 10 trips per lane to any of these CMP intersections.

Because the project is consistent with and conforms to the land uses and development density of the EWPP, the project would not result in additional adverse traffic operational effects on freeway segment levels of service and freeway ramp operations. Therefore, a CMP freeway analysis was not required.

4.
Other Transportation Issues

This chapter presents other transportation issues associated with the project, including:

- Conformance with the East Whisman Precise Plan
- Site access and circulation
- Effects on pedestrians, bicycles, and transit facilities
- Effects on surrounding neighborhood streets
- Parking

The analyses in this chapter are based on the City's *MTA Handbook* and professional judgment in accordance with the standards and methods employed by the traffic engineering community.

Conformance with East Whisman Precise Plan (EWPP)

The project is located within the EWPP area, which includes parcels bounded by US 101 and NASA Ames/Moffett Field to the north, the Sunnyvale city limits to the east, Central Expressway and South Whisman and Whisman Station Precise Plan areas to the south, and Whisman Road to the west. The project is in conformance with the EWPP, as described below:

- **Key Corners.** The project is located at a key corner (Ellis Street/National Avenue) based on the EWPP. A key corner should incorporate special building and open space design to provide a sense of place and wayfinding. The front doors of the lobby to the hotel would be provided near the intersection with an entry courtyard/open space at the key corner.

- **Shared Common Usable Open Area.** The project would provide an open area located in the middle of the project site, which would be usable by all employees and guests on site.

- **Local Streets.** National Avenue is a local street, which is defined by the EWPP to have low travel speeds, widened sidewalks, and dedicated bicycle facilities to help encourage travel by non-vehicle modes. The project would widen the sidewalks on National Avenue to 7 feet and add a new buffered bicycle lane by removing the on-street parking along the project frontage.

- **Curb-Cut Frequency.** There is currently one driveway along National Avenue and four driveways along Ellis Street. The project would remove the existing four driveways and provide one driveway on National Avenue and one driveway on Ellis Street, which meets the requirement of one curb cut per 200 feet of public street frontage.

- **Wider Sidewalks.** The project would provide wider sidewalks along its frontages on National Avenue and Ellis Street. On National Avenue, the sidewalk would be 7 feet wide with 15 feet of landscaping between the walk zone and vehicle travel lane. The sidewalk on Ellis Street would be 14 feet wide (8 feet of walk zone and 6 feet of landscaping).

- **Bicycle Facilities.** The project would install a 7-foot bike lane with 3-foot buffer along National Avenue and maintain the existing bike lane along Ellis Street.
- **On-Street Parking.** National Avenue requires an 8-foot parking lane along one side of the street. The project would remove the existing on-street parking along the project frontage on National Avenue. On-street parking would remain on the opposite side of National Avenue.
- **Parking Frontage.** Parking should be located at the interior, side, or rear of a lot and/or the least visible location from the street. Parking for the office and hotel would be provided in an above-grade garage with the garage entrance located on the west side of the hotel building, away from the street frontage. The surface parking spaces would also be located on the west side of the office building.
- **Loading and service access.** Loading docks, trash enclosures, and similar areas should not face public streets, parks, and publicly accessible open spaces. The loading space and trash enclosure would be located along the west side of the hotel building and along the north side of the office building, away from the street frontage.
- **Public Paseos.** The EWPP proposes paseos within the area. The project would provide a public paseo between the office and hotel buildings. Although the site plan does not indicate the paseo would be multi-use, the paseo should be signed to accommodate both pedestrian and bicycle access to comply with Figure 9 in the EWPP, on page 46.

Transportation Demand Management (TDM) Requirements

The EWPP specifies that all new office and research and development projects should become a member of the Mountain View Transportation Management Association (TMA) and provide a TDM plan with programs and measures to reduce vehicle trips. Site design features and operational TDM measures required by the EWPP include:

- Providing priority parking for carpools and vanpools,
- Providing bicycle parking and shower and changing facilities,
- Providing maximum parking and carshare parking,
- Orienting building entrances toward sidewalks, transit stops and bicycle routes, and
- Providing monetary incentives, such as subsidized transit passes or bike-share for residents and/or unbundled parking.

The TDM plan may include other measures to reach the required trip targets, including, but not limited to:

- Providing shared bicycles on site,
- Providing a parking cash-out, paid parking, or other parking monetization,
- Providing a guaranteed ride home program,
- Providing telecommute support, and
- Providing an alternative work schedule.

Site Access and Circulation

A review of the project site plan was performed to determine if adequate vehicle site access and on-site circulation would be provided and to identify any access or circulation issues that should be improved. This review is based on the site plan prepared by Arris, dated December 01, 2022, presented on Figure 2 and in accordance with generally accepted traffic engineering standards.

Vehicular Site Access

Vehicle access to the project site would be provided via a reconfigured full-access driveway in the southwest corner of the project site on National Avenue and an outbound only driveway in the northeast corner of the site on Ellis Street. The project would remove the existing four driveways along Ellis Street. The full access driveway would lead to the parking garage and the surface spaces located on the west side of the hotel and office buildings. According to the City of Mountain View Zoning Code, driveways should be a minimum of 18 feet wide for a two-way driveway and 12 feet wide for a one-way driveway. The two-way driveway would be 26 feet wide, and the one-way outbound driveway would be 20 feet wide, which would meet City guidelines.

Traffic Operations at Project Driveways

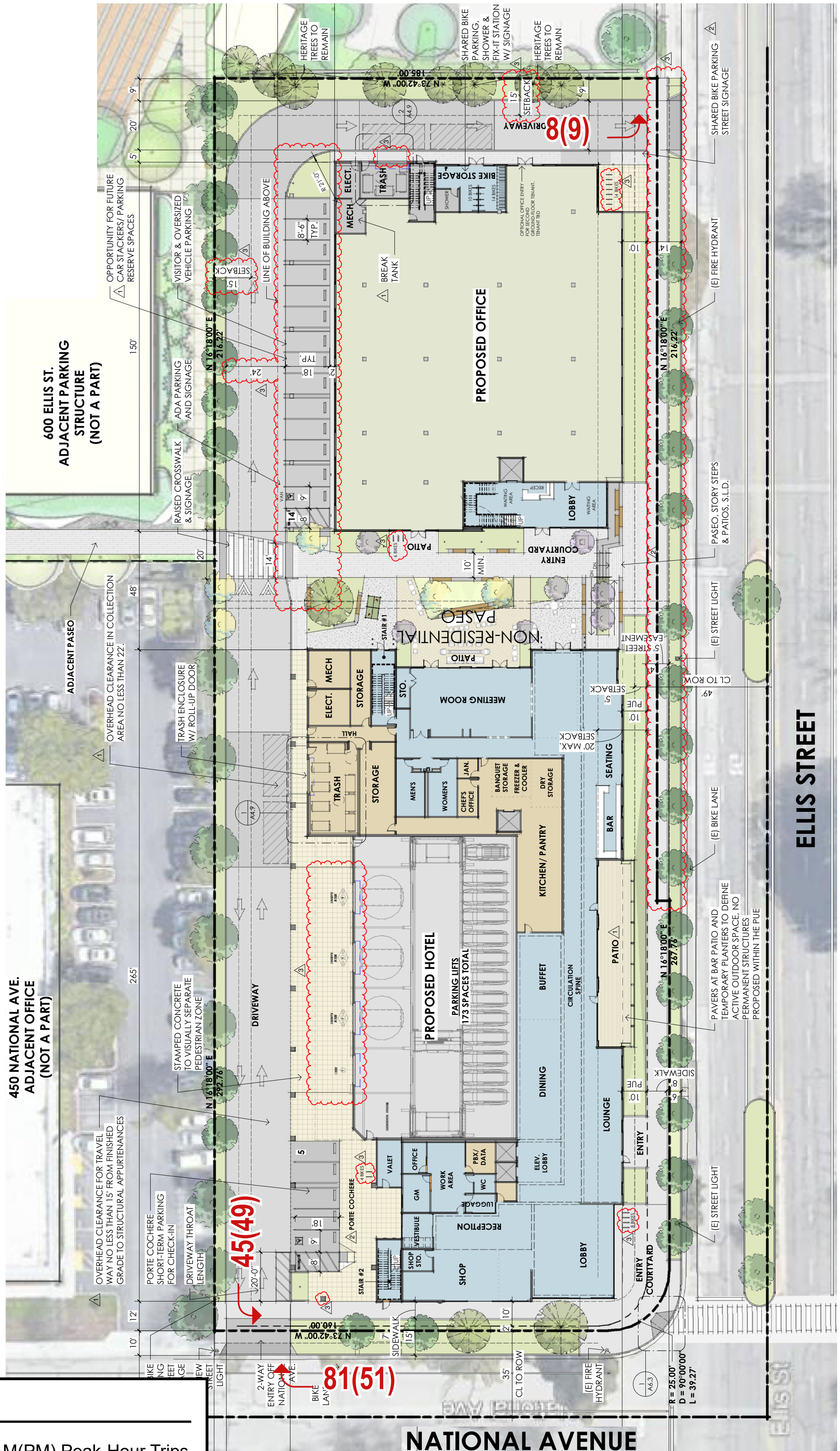
Traffic operations at the project driveways were evaluated to identify whether there would be vehicle queuing issues. The gross site trips that would occur at the project driveways are 81 inbound trips and 53 outbound trips during the AM peak hour, and 51 inbound trips and 58 outbound trips during the PM peak hour (see Figure 11).

National Avenue Driveway

The project trips that are estimated to occur at the National Avenue driveway are 81 inbound trips and 45 outbound trips during the AM peak hour and 51 inbound trips and 49 outbound trips during the PM peak hour. All of the traffic is expected to make a right turn into the driveway from westbound National Avenue and a left turn out of the driveway to eastbound National Avenue. Vehicles turning right into the project site from westbound National Avenue may block the travel lane momentarily due to vehicles slowing down to turn into the driveway, but this would not have a significant effect on traffic operations. Because the traffic along National Avenue is low, there is expected to be minimal delay for any southbound left turn traffic out of the driveway. Given the estimated 49 outbound trips in the PM peak hour at the driveway, that calculates to about one outbound trip every 73 seconds, the probability of two or more outbound vehicles exiting the site at the same time would be low. The maximum queue is not expected to affect the on-site circulation.

Ellis Street Driveway

The Ellis Street driveway would be an outbound only driveway. There are estimated to be 8 outbound trips during the AM peak hour and 9 outbound trips during the PM peak hour. Some minor on-site vehicle queuing could occur due to a combination of the inherent unpredictability of vehicle arrivals at the driveway and the random occurrence of gaps in traffic along Ellis Street. However, given the estimated 9 outbound trips in the PM peak hour at the driveway, that calculates to about one outbound trip every 5 minutes, the probability of two or more outbound vehicles exiting the site at the same time would be low. The maximum queue is not expected to affect the on-site circulation.



LEGEND

XX(XX) = AM(PM) Peak-Hour Trips

Figure 11
Project Trips at Driveways

NORTH
Not to Scale

Sight Distance at Project Driveways

The project driveways should be free and clear of any obstructions to provide adequate sight distance, thereby ensuring that exiting vehicles can see pedestrians on the sidewalk and vehicles and bicycles traveling on National Avenue and Ellis Street. Providing the appropriate sight distance reduces the likelihood of a collision at a driveway and provides drivers with the ability to locate sufficient gaps in traffic and exit a driveway.

According to the City's Standard Detail A-22, any landscaping and signage within the pedestrian triangle and vehicle triangle at the driveway should be no taller than 3 feet and located in such a way to ensure an unobstructed view for drivers exiting the site, and street trees must have a high canopy of at least 6 feet. The landscaping features shown on the site plan are not expected to obstruct the vision of exiting drivers provided the landscaping is also kept at a low level within the pedestrian triangle and vehicle triangle at the driveways.

The speed limit on National Avenue is 25 mph. According to the Standard Detail A-22, the stopping sight distance for a 25-mph roadway is 150 feet. Looking to either direction while exiting the project driveway, adequate sight distance would be provided for vehicles traveling on National Avenue and turning from Ellis Street. There are no roadway curves on National Avenue that would obstruct the vision of exiting drivers for the driveway. There is an existing driveway west of the full access driveway. However, exiting vehicles would be able to clearly see the vehicles exiting out of the adjacent driveway as they would be stopped. The project plans to remove the on-street parking along the project frontage on National Avenue. Thus, adequate sight distance would be provided along National Avenue.

The speed limit on Ellis Street is 40 mph, and thus, the stopping sight distance is 250 feet. There would be approximately 215 feet between the driveway and the Fairchild Drive intersection. However, exiting vehicles would be able to see past the intersection, as there are no roadway curves on Ellis Street within 250 feet of the driveway that would obstruct the vision of exiting drivers, and on-street parking is prohibited. Thus, adequate sight distance would be provided along Ellis Street.

Corner Visibility at Ellis Street and National Avenue

The project site fronts the northwest corner of the Ellis Street/National Avenue intersection. The intersection corners should be free and clear of any obstructions to optimize corner visibility per the City's Standard Details A-23, thereby ensuring the vehicles approaching the intersection can see other vehicles or bicycles traveling on the cross street. Any landscaping and signage within the safety visibility triangle at the intersection corners should be no taller than 3 feet and in such a way to ensure an unobstructed view for drivers on the street.

The landscape plan shows street trees would be added to the corner, 35 feet back from the right-of-way. The type and location of the street trees would be determined by the City of Mountain View Public Works Department at the implementation stage. Note that street trees have a high canopy and would not obstruct the view of drivers.

Vehicle On-Site Circulation

Within the site, a two-way 26-foot drive aisle would be provided to access the hotel short-term parking spaces, parking garage, and the truck loading zone. Past the parking garage entrances and the truck loading zone, the drive aisle would become one-way and lead to the visitor surface parking spaces for the office. The drive aisle would narrow to 24 feet for the one-way section on the west side and 20 feet on the north side of the office building. The project would meet the City of Mountain View Zoning Code requirement of a 24-foot travel lane for single-loaded aisles with one-way traffic.

The parking garage to be shared between office and hotel uses would be a four-level automatic parking structure with three entry/exit portals and one exit-only portal. Vehicles accessing the parking garage would stop at the marked sign for each access portal, and a rolling door would open for the vehicle to drive into the bay. The driver would then exit their vehicle and garage, and the mechanical lifts would park the vehicle within the structure. With the automatic parking system, employees and guests would not have to circulate the parking garage to look for an available space. For exiting vehicles, a driver would wait outside of the garage for the mechanical lifts to bring down the vehicle. Once the vehicle is in the bay, the rolling door would open for the driver to access the vehicle and head out of the garage.

The parking garage that would be designed by the Utron Automated Parking would have 4 access points/portals with 4 bay rooms operating within the garage. Based on the data provided by the Utron, it is expected that each bay room could take/process 25 to 30 vehicles per hour for a throughput capacity of 120 vehicles per hour for the parking garage.

Based on the Urban Land Institute (ULI) Shared Parking, 3rd Edition, it is estimated that 92 percent of the office trips would be generated by employees who would access the garage. It is assumed that 70 percent of the hotel trips would be generated by guests that need to park in the garage, and the remaining 30 percent of hotel trips would be generated by guests using Uber/Lyft or other rideshare apps. Therefore, there would be 101 and 82 vehicles entering and exiting the parking garage during the AM and PM peak hours, respectively. The peak parking demand is lower than the throughput capacity for the proposed garage and would not result in on-site vehicle queuing at the access portals during the peak hours.

The one-way drive aisle would lead to visitor surface parking spaces. The surface parking stalls would be 90-degree uniform parking stalls. The stall depth (18 feet) of the surface parking spaces would meet City standards (18 feet).

Hotel Check-In Area

Of the total trips occurring at the driveways, 54 inbound and 49 outbound trips during the AM peak hour and 46 inbound and 36 outbound trips during the PM peak hour would be for the hotel. It is expected that most trips that enter the full access driveway would continue straight to the parking garage. Some hotel guests would use the short-term parking to check in or load in front of the lobby entrance. Following check-in, guests who are parking on-site would exit the check-in area and park in the hotel parking garage. Taxi cabs and ride-sharing services would the enter driveway on National Avenue, drop off hotel guests, and exit the site via the Ellis Street driveway.

On-site vehicle queuing at the check-in area for the hotel was estimated using the Poisson probability distribution method. For the purpose of the queuing estimates, it is assumed that approximately half of the outbound vehicle trips in the AM peak hour and half of the inbound vehicle in the PM peak hour would be attributable to new hotel guests checking into the hotel who would need to temporarily park at the loading area (PM inbound trips) or hotel guests who are checking out and need to load their baggage (AM outbound trips). An average check-in time of 5 minutes was also assumed. Based on these assumptions, it is estimated that the 95th percentile on-site queue of 5 and 4 vehicles would occur during the weekday AM and PM peak hours of traffic, respectively. The current site design shows 5 short-term parking spaces in the check-in area. Therefore, hotel guests accessing the check-in area would not cause on-site queuing issues or block the inbound traffic from the driveway.

Passenger Loading

The site plan does not indicate passenger loading zones along the project frontages or within the site for the office building, which would be inconvenient for people accessing the site using Uber/Lyft or other rideshare apps (e.g., Scoop, Waze Carpool). Passenger loading for the hotel would occur in check-in area with short-term parking spaces.

Recommendation: The project should designate one of the surface parking spaces west of the office building as a short-term passenger loading space to ensure that the rideshare vehicles do not block the drive aisle while waiting.

Truck Access and Circulation

Emergency vehicles and garbage trucks would access the site via the project driveway on National Avenue. Vehicles would be able to enter through the National Avenue driveway, travel through the site, and exit through the Ellis Street driveway.

The site plan shows one trash area located north of the parking garage entrances of the hotel building and near the northwest corner of the office building. Garbage trucks coming onto the site would enter the full access National Avenue driveway, pull over to the loading zones next to the trash enclosures to pick up the trash and exit the site using the Ellis Street driveway. The site plan shows trucks would be able to access the trash enclosures and pick up trash without any maneuvering issues (see Figure 12).

The City requires one loading space for commercial, industrial, institutional, and service uses of 10,000 to 30,000 square feet. For buildings with more than 30,000 square feet, one space is required per each additional 20,000 square feet. Based on these standards, the hotel would require 6 loading spaces, and the office would require 2 loading spaces. The project would provide 2 loading spaces for the hotel north of the trash enclosure and two loading spaces for the office along the northern edge of the office building. Loading spaces are required to be at least 10 feet wide, 25 feet long, and 12 feet high. All loading spaces would meet the dimension requirements. Because the loading spaces would be 10 feet wide, there would be about 10 feet of travel lane in the drive aisle which would be sufficient for a vehicle to get past any loading vehicles.

Pedestrian, Bicycle, and Transit Facility Assessment

The following describes the transit, pedestrian and bicycle facilities that serve the site and evaluates whether appropriate bicycle and pedestrian access and transit service are provided between the site and nearby destinations.

Pedestrian Operations

Pedestrian Access and Circulation

Pedestrian access to the project site is provided via sidewalks on Ellis Street, National Avenue, and surrounding streets. Pedestrian walkways would be provided through the site that provide pedestrian access from Ellis Street and National Avenue to elevators and stairways to the hotel and office buildings, amenities, and paseo within the site (see Figure 2). Pedestrian walkways would also be provided between the garage entrances and the hotel and office building. The project would provide an east-west multi-use paseo between the hotel and office buildings, for public and employee access between the sidewalks on Ellis Street and the planned public multi-use paseo west of the project site, which would ultimately connect to the existing public multi-use paseo between National Avenue and N. Whisman Road.

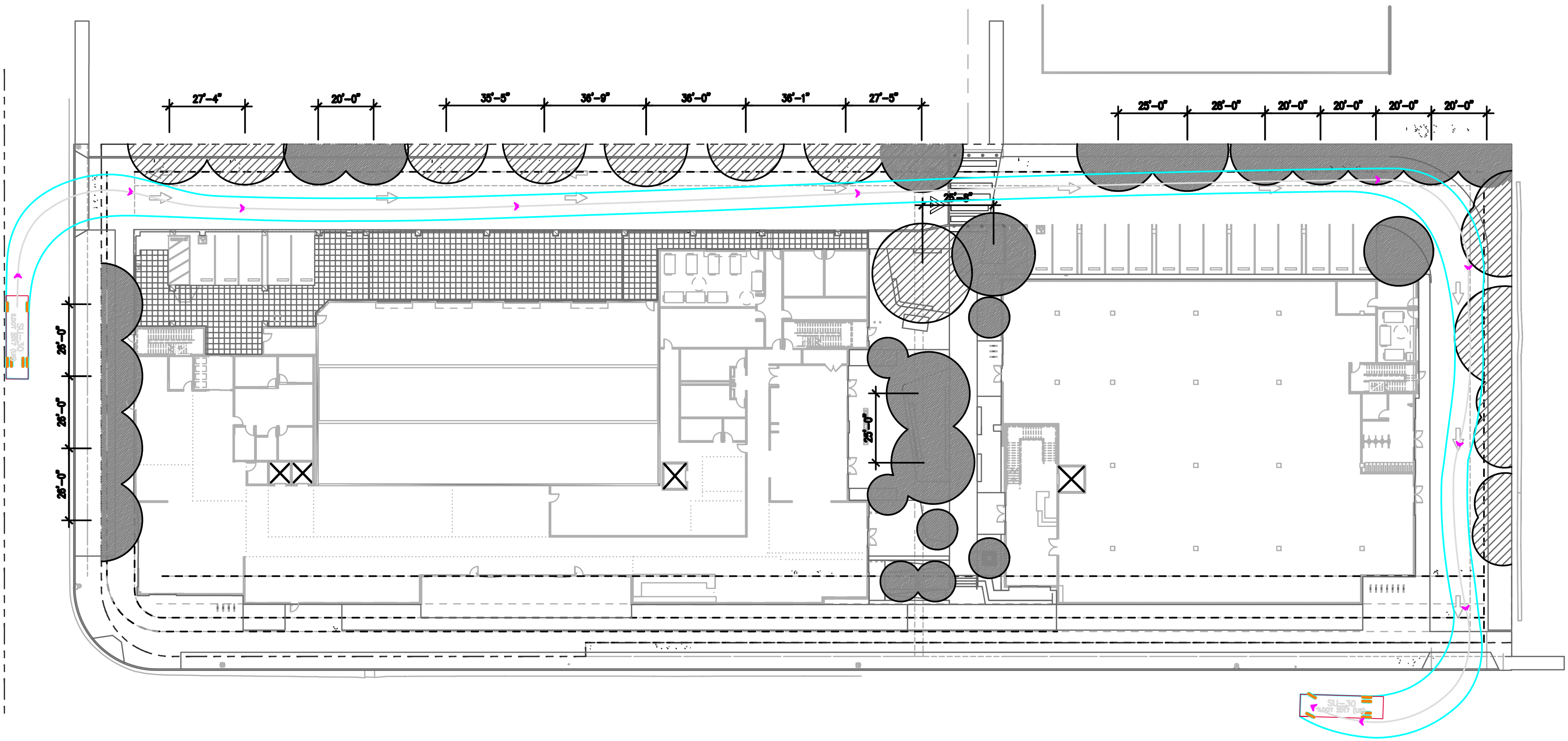


Figure 12
Freight and Garbage Truck Circulation

NORTH
Not to Scale

The project would provide 8-foot sidewalks with an additional 6 feet of landscaping between the sidewalk and vehicle travel lanes along the project frontage on Ellis Street. This would improve pedestrian comfort compared to the 6-foot attached sidewalks currently in place. The project would also provide 7-foot sidewalks along National Avenue along the project frontage with 15 feet of landscaping between the walk zone and vehicle travel lane.

ADA Access

ADA curb ramps are present at the intersection of Ellis Street/Fairchild Drive, the two midblock crossings along Ellis Street, and all the intersections on Middlefield Road between Bernardo Avenue and Easy Street. Most corners meet current ADA curb ramp designs, such as truncated domes and adequate curb ramp slopes. Truncated domes are the standard design requirement for detectable warnings which enable people with visual disabilities to determine the boundary between the sidewalk and the street.

The following intersections in the project vicinity include at least one corner that does not include truncated domes, and the ramp slope of these ramps do not appear to meet the current ADA standard.

- Northwest corner of the Ellis Street/National Avenue intersection
- North leg corners of the Ellis Street/Manila Avenue intersection
- West leg corners of the Ellis Street/US 101 Southbound Ramps intersection
- Northwest corner of the Ellis Street/Fairchild Drive intersection

The project would build a new curb ramp at the northwest corner of Ellis Street and National Avenue. The new curb ramp would be built to ADA standards.

Pedestrian Infrastructure, Safety, and User Experience

Pedestrian facilities in the study area consist of sidewalks and crosswalks. Most surrounding streets have sidewalks although there are some missing sections. Crosswalks with pedestrian signal heads are located at all of the signalized intersections in the project vicinity, except at the Ellis Street/US 101 Northbound Ramps intersection, which provides pedestrian signal heads with no crosswalk on the west leg. Two high-visibility midblock crosswalks are available on Ellis Street between the project site and Middlefield Road. The project would update the northwest corner of the Ellis Street/National Avenue intersection with new curb ramps and a high visibility crosswalk on Ellis Street.

As discussed in the EWPP, pedestrian facilities in the area are lacking fine-grained connectivity. The project would install an east-west paseo between the office and hotel buildings to connect to the planned paseo west of the project site. The proposed paseo would implement the EWPP’s plan to have an east-west paseo that would connect the multi-use paths west of the LRT tracks to Whisman Road.

According to the 2012 General Plan, a neighborhood is walkable when people can travel comfortably and safely on foot to many destinations. Convenient walking distance is considered to be a half mile to a mile, a walk that would take 10 to 20 minutes. Within a half mile of the project site, there are two restaurants (on Whisman Road and Ellis Street), the Bayshore/NASA and Middlefield LRT Stations, and bus stops on Middlefield Road.

Although located within one-half mile, access to some of the surrounding land uses and bus stops would require crossing busy arterial streets (Ellis Street and Middlefield Road). The wide streets might be uncomfortable for some pedestrians to cross and would not be considered a quality pedestrian environment. The EWPP characterizes the area in which the project is located to be a mixed-use area. Thus, it is expected that future developments would include more commercial uses to be utilized by the project’s employees and guests.

The EWPP proposes to implement new service streets, greenways, or multi-use paths within the area to improve pedestrian connectivity in the area. It is expected that this pedestrian friendly infrastructure would be implemented as future developments are built in the area.

Pedestrian Quality of Service

Pedestrian quality of service (PQOS) identifies the level of comfort for pedestrians on any given roadway. Mountain View's Comprehensive Modal Plan (AccessMV), published in May 2021, includes a PQOS map (see Figure 13) that shows continuity or gaps in the pedestrian facilities as indicated with a PQOS score ranging from 1 to 5. A higher PQOS score indicates a low quality of service.

The PQOS metric in the AccessMV document covers the following factors:

- Proximity to a variety of destinations and amenities
- Street connectivity and directness of routes to destinations
- Presence of a continuous network of pedestrian facilities
- Motor vehicle traffic speed; and
- Street width and intersection conditions

Based on the PQOS map, the following streets in the project vicinity have a PQOS greater than 2, which is not desirable:

- Whisman Road (PQOS 5)
- Middlefield Road (PQOS 5)
- Ellis Street (PQOS 5)
- Maude Avenue between Logue Avenue and Clyde Avenue (PQOS 4)
- Maude Avenue between Clyde Avenue and the City limit (PQOS 5)
- Logue Avenue (PQOS 4)

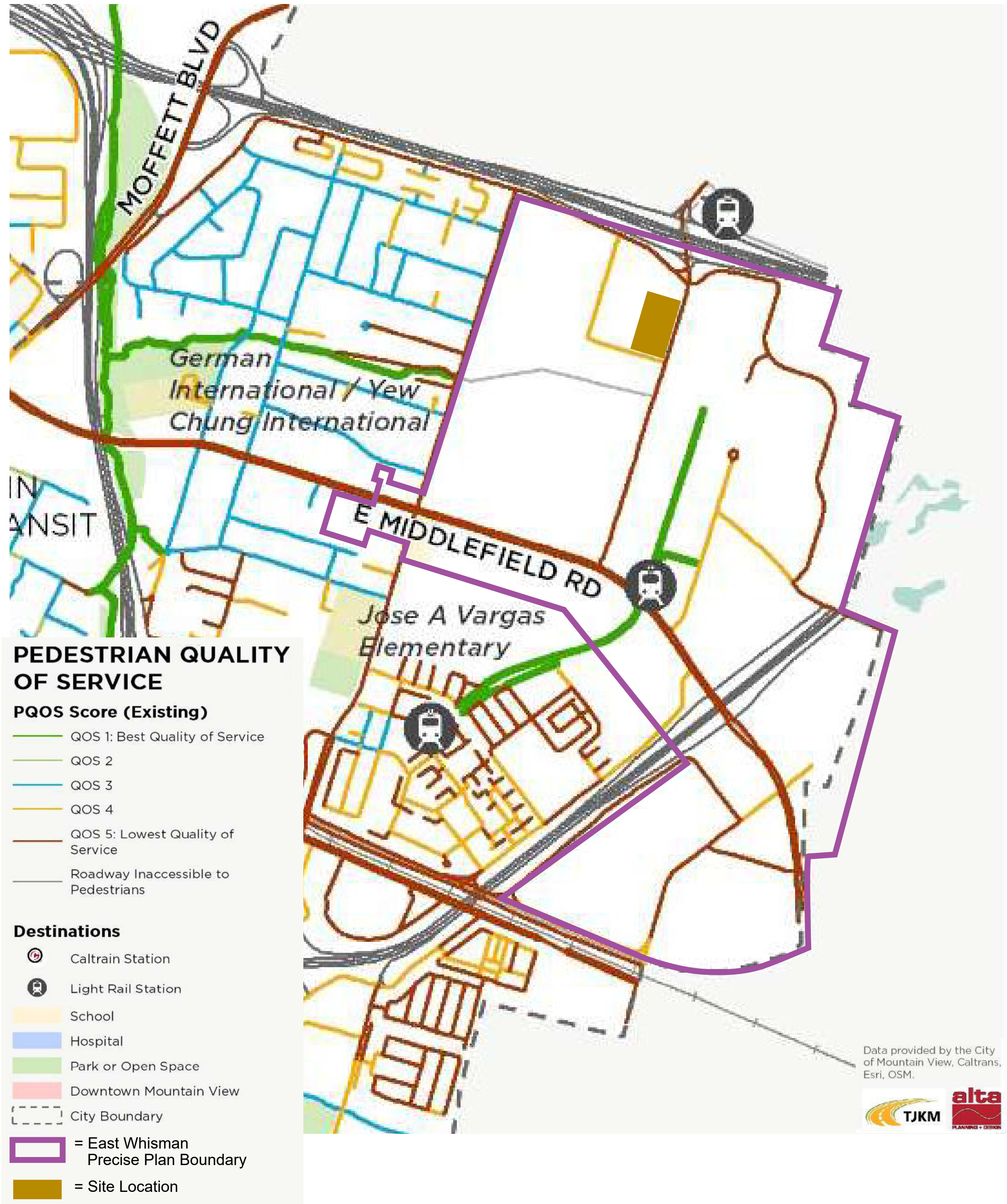
The project would have an adverse effect on pedestrian operations because the project is expected to add vehicle trips to these street segments that have a PQOS score of 3 or more, except for Logue Avenue.

The project would provide an east-west multi-use paseo between the hotel and office buildings, for public and employee access between the sidewalks on Ellis Street and the planned public multi-use paseo west of the project site, which would ultimately connect to the existing public multi-use paseo between National Avenue and N. Whisman Road. The project would also provide wider sidewalks with landscaping along the project frontages to enhance the pedestrian environment. Taking these factors into account, the project is expected to improve the PQOS along Ellis Street along the project frontage.

Bicycle Operations

Bicycle Access and Circulation

Bicycle access to the project site is via Ellis Street and E. Middlefield Road. There are bike lanes on Ellis Street and Middlefield Road that connect cyclists from the project site to the surrounding areas. The site plan shows that the project would install a multi-use paseo between the office and hotel buildings and a buffered bike lane along National Avenue (see Figure 2). The paseo and buffered bike lane would ultimately connect to the public multi-use paseo between National Avenue and N. Whisman Road, which connects to the bike lanes along Whisman Road and the Hetch Hetchy Trail. The project would provide secure bicycle storage for office employees on the ground floor of the office building in the northern section of the building.



Source: Access MV, City of Mountain View, 2021

Figure 13
Pedestrian Quality of Service Map

NORTH
Not to Scale

Short-term bicycle racks would be placed in well-lit, highly visible locations in front of the hotel lobby in the southeast corner of the site and in the northeast corner of the office building. The bike racks could be accessed via Ellis Street.

Bicycle Infrastructure, Safety, and User Experience

In the immediate project vicinity, there are bike lanes on Ellis Street and Middlefield Road. A buffered bicycle lane is proposed by the project along National Avenue. Additional planned bike facilities in the EWPP are described further below. The bike lanes on Middlefield Road between Thaddeus Drive and Logue Avenue are part-time bike facilities that are used as bike lanes from 2 AM to 7 PM on weekdays and are used for on-street parking for the remaining hours (7 PM to 2 AM) and on weekends.

The 2015 Bicycle Transportation Plan Update evaluates the quality of the bicycle network in the City in terms of connectivity gaps and low stress gaps. The plan identifies spot gaps, connection gaps, and quality gaps along Whisman Road, Ellis Street, Middlefield Road, Logue Avenue, and Maude Avenue. Spot gaps refer to point-specific locations lacking dedicated bicycle facilities or other treatments to accommodate safe and comfortable bicycle travel. Connection gaps are missing segments on a clearly defined bikeway, while quality gaps are links of an existing bikeway that are deficient or have operational shortcomings. The plan also identifies the low stress bicycle network. Low stress segments include Class I separated paths and streets with low traffic volumes, low traffic speeds, and bike facilities such as a protected bike lane or a bike boulevard. These are facilities where people feel most comfortable biking because they typically have the least interaction with motor-vehicles. None of the surrounding roads are classified as low stress bicycle facilities. However, the project would install a bike lane along the south edge of the project site to provide better bicycle connectivity from the site.

The EWPP proposes to implement buffered bike lanes on Maude Avenue, National Avenue, Logue Avenue, Clyde Avenue, Maude Avenue, Ellis Streets, and Middlefield Road and new multi-use paths/paseos in the project vicinity. It is expected that this bicycle friendly infrastructure would improve the quality of the bicycle network in the area.

Bicycle Level of Traffic Stress

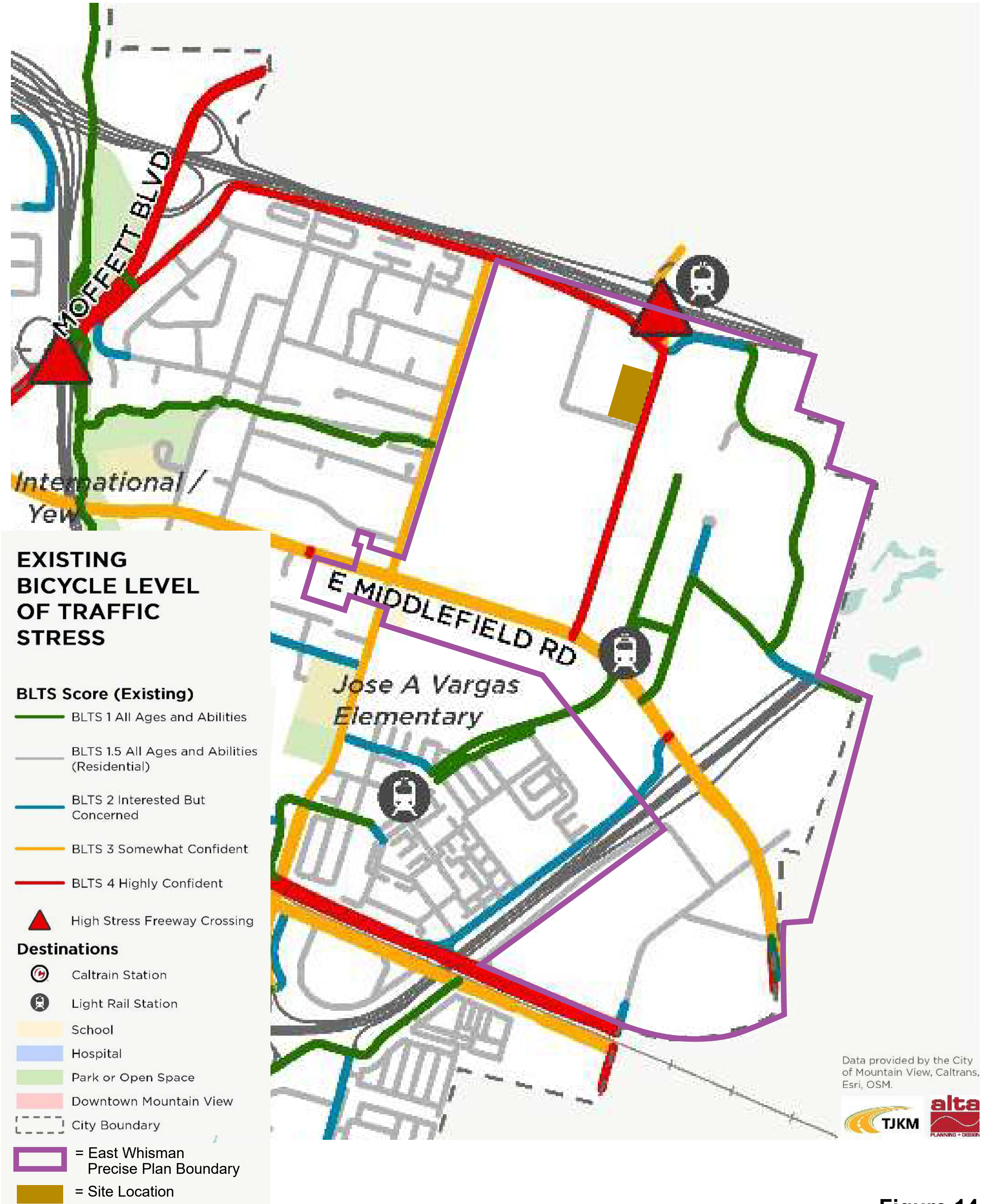
The City's AccessMV report includes a bicycle level of traffic stress (BLTS) map (see Figure 14) to identify the perceived comfort and safety of existing roads and bikeway facilities from the perspective of cyclists, as indicated with a BLTS score ranging from 1 to 4. A BLTS score of 1 is comfortable for all ages and abilities, a BLTS score of 2 is comfortable for an average adult, while a BLTS score of 4 indicates that the streets are comfortable only for highly confident riders. The metric (ranging from 1 to 4) in the AccessMV document covers the following factors:

- Number of through lanes or street width
- Posted speed limit or prevailing vehicle speed
- Presence and type of bicycle facilities
- Presence of traffic signals

Based on the BLTS map, the following streets in the project vicinity have a BLTS greater than 2, which is undesirable:

- Whisman Road (BLTS 3)
- Ellis Street (BLTS 4)
- Middlefield Road (BLTS 3)

The project would create an adverse effect on bicycle operations, as the project is expected to add vehicle trips to these streets.



Source: Access MV, City of Mountain View, 2021

Figure 14
Bicycle Level of Traffic Stress

The AccessMV report also includes a BLTS map considering the planned bicycle facilities listed in the Caltrans District 4 Bike Plan (2018), the VTA Countywide Bicycle Plan (2018), the City of Mountain View Bicycle Transportation Plan (2015), the Caltrain Bicycle Access and Parking Plan (2008), and several area precise plans, including the EWPP. With the planned improvements identified in these documents, Ellis Street is expected to continue to have a BLTS score of 4, and Middlefield Road and Whisman Road would continue to have a BLTS score of 3. All other streets in the project area would have a BLTS score of 2 or lower.

The EWPP proposes to implement buffered bike lanes on National Avenue, Ellis Streets, and Middlefield Road, where the project would add vehicle trips. The project would install a bike lane along the project frontage on National Avenue to connect to the existing bike lane on Ellis Street. Additionally, the project will be required to contribute to the bike lane improvements identified by the EWPP by paying for the EWPP Development Impact Fee, which would address the adverse effects.

Transit Operations

Transit Facilities, Service, and Access

The project site is served by VTA Route 21, with bus stops located on Middlefield Road, and is located within a half mile of the Bayshore/NASA and Middlefield LRT Stations. According to the California Public Resources Code Section 21155, a major transit stop is defined as an existing rail or bus rapid transit station or as the intersection of two or more major bus routes with a frequency of service interval of 15 minutes or less during peak commute periods. Therefore, the project is located in a transit proximity area because it is within a half mile of a major transit stop.

Transit Operations

It is expected that the project would generate some transit trips to get to the North Bayshore area or to other destinations. According to VTA *TIA Guidelines*, approximately 6 percent of Mountain View employees use public transit to get to work. The ITE trip generation rates for General Office (Land Use 710) are 1.52 for the AM peak hour and 1.44 for the PM peak hour. Applying 6 percent transit mode share equates to 4 transit riders during the AM and PM peak hours. During the AM and PM peak hours, there are three light rail trains that run in each direction and two Route 21 buses that run in each direction. This new ridership generated by the project could be accommodated by these existing services.

Due to the small number of new vehicle trips generated by the project, the project would result in a minimal increase in vehicle delay at the study intersections and would not cause a noticeable change in transit travel time and vehicle delay for the bus routes in the study area.

Effects on Surrounding Neighborhood Streets

Direct access to the project site is via Ellis Street and National Avenue. Ellis Street and National Avenue are already serving office and commercial uses in the project vicinity. Thus, project trips traveling on Ellis Street and National Avenue would not be considered cut-through traffic. In addition, there are no residential streets surrounding the project site that would provide access to the site. Therefore, the project is not expected to cause an adverse effect or cut-through traffic issues on the surrounding neighborhood streets.

There would be potential cut-through traffic along Fairchild Drive/Leong Drive between Moffett Boulevard and Ellis Street to bypass congestion along US 101. Leong Drive/Fairchild Drive does not have any stop signs between Moffett Boulevard and Ellis Street, which could promote cut-through for drivers who are familiar with the area. However, the segment of US 101 between Moffett Boulevard and Ellis Street is generally not as congested as the rest of the freeway. Thus, it is not likely that vehicles would use Fairchild

Drive to cut through. The City's Neighborhood Traffic Management Plan (NTMP) is available to address any concerns for the neighborhood, and the project should contribute to the traffic calming measures identified in the NTMP if the project results in cut-through traffic along Leong Drive/Fairchild Drive.

Parking

Vehicle Parking

Vehicle parking for the project was reviewed per the City of Mountain View requirements, parking demand rates from local utilization survey data, the 5th Generation ITE *Parking Generation Manual,* and the Urban Land Institute (ULI) publication *Shared Parking*. A shared parking analysis was conducted for office and hotel uses based on the ULI *Shared Parking* methodology.

Parking rates for office and hotel uses are evaluated based on local utilization survey data and the *ITE Parking Generation Manual*.

City Parking Requirements

The EWPP requires a maximum of 2.9 spaces per 1,000 s.f. of office use in the project area. There are no minimum parking requirements in the project area. The EWPP does not have a requirement for hotel parking; thus, the City's Zoning Code requirements were used. The City requires one space for each guest room plus one space for every 2 employees. Thus, based on the City's requirements, the project should provide 110 maximum spaces for the office and 209 minimum spaces for the hotel.

The site would provide a total of 187 spaces in the parking garage and surface lot for the office and hotel combined, which would not meet the City's minimum parking requirement for the hotel.

The EWPP encourages shared parking where complementary uses occur, such as hotel and office parking. Shared parking and lower parking ratios are appropriate to consider for this project due to the transit proximity and proposed surrounding uses.

ITE Parking Demand

The parking demand produced by a new development can be estimated by applying the size of the project to the applicable parking demand rates contained in the ITE *Parking Generation Manual*, 5th Edition. Parking demand that would be generated by the proposed office and hotel were estimated using the 85th percentile ITE rates for "General Office" (Land Use 710) and Business Hotel (Land Use 312). Based on the ITE Manual, the office would generate a parking demand of 124 parking spaces (3.30 space per 1,000 s.f.), and the hotel would generate a parking demand of 169 parking spaces (0.84 space per room), assuming full occupancy of 201 rooms.

Based on the ITE rates, the total parking demand without shared parking would be 293 spaces (see Table 8).

Local Parking Surveys

Counts were conducted at local office buildings near transit between 2016 and 2018 by Hexagon (see Appendix D). The office locations surveyed are in close proximity to Caltrain stations or offer shuttles to a nearby Caltrain station. For office buildings near transit, the average peak parking demand rate was found to be 2.03 spaces per 1,000 s.f. Based on this rate, the parking demand for the office building would be 76 spaces.

Parking counts for hotels were conducted by Hexagon between 2014 and 2019 (see Appendix D). Overall, the parking survey results show that the number of parked cars is less than the number of occupied rooms. This pattern can be attributed to guests using other modes of transportation such as

Caltrain, taxi, ride sharing services, and local transit services. Based on the surveys for hotels near transit, the parking demand ratio averages 0.56 space per occupied room. Using this ratio, the hotel would have a peak parking demand of 113 spaces, assuming full occupancy of 201 rooms.

Based on the local parking rates, the parking demand without shared parking would be 189 spaces (see Table 8), which are 2 spaces greater than the proposed number of parking spaces.

Table 8
ITE and Local Survey Parking Rates

Land Use	Size		ITE Parking Rate[1]	Local Parking Surveys	Number of Spaces Required	
					ITE	Local
Office	38	ksf	3.30	2.03	124	76
Hotel	201	rooms	0.84	0.56	169	113
Total Number of Parking Spaces					**293**	**189**

Notes:
1. Based on the 85th percentile rate for weekdays published in the ITE *Parking Generation Manual* (5th Edition).

Shared Parking Analysis

Shared parking is the use of a parking space to serve two or more individual land uses due to variations in parking demand by hour among differing land uses. Summing the parking demand generated by each use at every hour generally results in an overall peak parking demand for a mixed-use site that is less than the sum of the peak parking demands for each individual use. Thus, the application of the principle of shared parking may reduce the total parking demand for mixed-use developments.

The shared parking analysis is based on time-of-day factors obtained from the Urban Land Institute (ULI) *Shared Parking, 3rd Edition* and the local survey parking rates. Table 9 shows the hourly parking demand for each use and the site's total parking demand with shared parking for the parking garage. The ULI estimates 92 percent of the parking demand for office comes from employees, and the remaining 8 percent comes from visitors. Because the office visitors would use the surface parking lot and would not park in the parking garage, the visitor demand was not considered for the shared parking analysis for the parking garage. With shared parking, the maximum parking demand for the parking garage would be 142 spaces occurring on weekdays. The peak parking demand is expected to occur at 9 AM on weekdays and 11 PM to 12 AM on weekends.

The project proposes to provide 173 total parking spaces within the garage for the office employees and hotel guests, which is sufficient to meet the maximum demand of 142 spaces. The project should reserve 70 spaces in the garage for the office employees between the hours of 9 AM and 5 PM, which would leave 103 spaces to be shared by both the office and hotel. Between the hours of 9 AM and 5 PM, the hotel is expected to have a maximum demand of 79 parking spaces. Thus, both the office and hotel parking demands are expected to be accommodated.

Recommendation: The project should reserve 70 spaces in the garage for the office employees between the hours of 9 AM and 5 PM.

Table 9
Shared Parking Analysis for the Parking Garage

Hour of Day	Office Employee[1]		Business Hotel		Total	
	Wkdy	Wknd[2]	Wkdy	Wknd	Wkdy	Wknd
6 a.m.	2	0	107	107	109	107
7 a.m.	11	3	102	102	112	105
8 a.m.	35	8	90	90	125	99
9 a.m.	63	11	79	79	142	90
10 a.m.	70	13	68	68	138	80
11 a.m.	70	14	68	68	138	82
Noon	60	13	62	62	122	75
1 p.m.	60	11	62	62	122	73
2 p.m.	67	8	68	68	134	76
3 p.m.	67	6	68	68	134	73
4 p.m.	60	3	73	73	133	76
5 p.m.	42	1	79	79	121	81
6 p.m.	18	1	85	85	102	85
7 p.m.	11	0	85	85	95	85
8 p.m.	4	0	90	102	94	102
9 p.m.	2	0	96	96	98	96
10 p.m.	1	0	107	107	108	107
11 p.m.	0	0	113	113	113	113
Midnight	0	0	113	113	113	113
					Max. Demand	
	70	**14**	**113**	**113**	**142**	**113**

Time of Day parking rates based on Urban Land Institute (ULI) Shared Parking, 3rd Edition, 2020.
Notes:
1. Based on *the* ULI *Shared Parking*, 92% of parking demand was from employees and 8% was from visitors. However, only the demand from office employees was considered because visitors would not utilize the shared parking spaces within the garage.
2. Maximum parking demand in the weekends was assumed to be 20% of the parking demand on weekdays.

Bicycle Parking

The EWPP requirements for bicycle parking are one-long term space per 2,000 square feet and one short-term space per 20,000 square feet of office. The City's Zoning Code requires 2 percent of vehicle spaces for hotel use. Thus, the project would require 19 long-term spaces and 2 short-term spaces for the office and 4 spaces for the hotel, based on 187 vehicle parking spaces. The project would provide 24 long-term spaces and 32 short-term spaces for the entire project.

There would be a secure bicycle room on the ground floor of the office in the northern section of the building. Short-term bicycle racks would be placed in well-lit, highly visible locations in the northeast and southeast corners of the property. The racks should be inverted U-racks to be consistent with the VTA Bike Technical Guidelines. The project would meet the required number of short-term and long-term bicycle parking spaces.

Attachments are available from the Community Development Department upon request.

Please email planning.division@mountainview.gov.