HEXAGON TRANSPORTATION CONSULTANTS, INC.

2 E 3rd Avenue Development Project

Draft Trafic Impact Analysis

Prepared for:

City of San Mateo

April 9, 2015

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Hexagon Job Number: 15GB09
Document Name: 2E3rd_TIA_4-9-2015.doc

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Executive Summary

This report presents the results of the traffic study for the proposed mixed-use development at 2 E 3rd Avenue in San Mateo, CA. The project site is located on an 8,604 square-foot vacant lot on the southeast corner of E 3rd Avenue and S El Camino Real. The project would build a 23,968 square-foot, three-story building with 20,025 square feet (s.f.) of office space on three floors and 3,943 s.f. of retail space on the ground floor. The project would not include any on-site parking spaces. Parking would be accommodated in existing downtown lots and garages.

The traffic study was conducted for the purpose of identifying potential traffic impacts related to the proposed development. The impacts of the project were evaluated following the standards and methodologies set forth by the City of San Mateo and the City/County Association of Governments of San Mateo County (C/CAG). Project impacts on other transportation facilities, such as bicycle facilities and transit services, were determined on the basis of engineering judgment. The study determined traffic impacts of the proposed development on 15 signalized study intersections during the weekday AM and PM peak periods of traffic. None of the study intersections is part of the San Mateo County Congestion Management Program (CMP) roadway network. Since it is estimated that the project would generate fewer than 100 peak hour vehicle trips, preparation of a trip reduction plan in accordance with the C/CAG trip reduction checklist is not required.

The study also provides discussion of vehicle miles traveled (VMT) in accordance with SB 743 for projects that in San Mateo versus the Bay area average and the transportation demand management (TDM) programs that could be implemented for the project.

Project Trip Estimates

Project trips associated with the proposed office and retail uses are estimated based on average trip generation rates obtained from ITE *Trip Generation Manual*, 9th Edition, for general offices (Land Use 710) and shopping centers (Land Use 820). Since this project is located within downtown San Mateo and has good pedestrian facilities as well as transit services, Hexagon has estimated that approximately 15% of all office trips would use alternative modes of transportation. Hexagon arrived at the 15% trip reduction factor based on the trip surveys for urban infill, mixed-use, and transit-oriented developments published in the Caltrans' Trip-Generation Rates for *Urban Infill Land Uses in California*, June 2009. The Caltrans study indicated that the observed trip rates for a general office building in downtown San Francisco were 22 – 38% lower than the ITE trip rates. Downtown San Mateo is served by fewer transit routes and has cheaper parking fees than San Francisco. Therefore, the office trip reduction for the project is assumed to be lower than the observed reduction in San Francisco. The retail space is assumed to serve mainly the nearby businesses and residents. Hexagon has thus applied a 50% trip reduction to the retail trips. The non-auto (reduced) trips would be accomplished through walking, biking, or taking transit. After applying the trip reduction factors, the project is expected to generate a total of 28 trips during the AM peak hour and 32 trips during the PM peak hour.

Intersection Traffic Operations

Table ES-1 summarizes the results of the peak-hour intersection level of service analysis under the following conditions: existing (Chapter 2), background (Chapter 3), background plus proposed project (Chapter 4), background plus proposed project and 221 S El Camino Real project (Chapter 5), and cumulative (Chapter 6) conditions. The results show that under all analysis scenarios, all signalized study intersections are expected to operate at mid-LOS D or better during the AM and PM peak hours. Therefore, the project would have no significant impacts on traffic operations according to the San Mateo standards.

Vehicle Miles Traveled

In accordance with SB 743, daily VMT for projects in downtown San Mateo versus the Bay area average are presented based on the Metropolitan Transportation Commission (MTC) travel demand forecast model (http://analytics.mtc.ca.gov/foswiki/Main/VmtPerWorker). The forecasted daily VMT is 26.4 miles per worker employed in downtown San Mateo, while the Bay Area average daily VMT is 23.8 miles per worker.

Since no standard approach or guidelines have been finalized under SB 743, the VMT presented in the report is for informational purposes only. It is not intended to provide any indication of the transportation impacts of the project under SB 743.

Site Access

The project would not include any on-site parking spaces. Pedestrian access is provided by the existing sidewalks and crosswalks. Within the vicinity of the project site, all roadways currently have pedestrian sidewalks on both sides of the road. All intersections currently have crosswalks on all approaches with pedestrian walk signals.

Bicycle facilities within the vicinity of the project site are shown on Figure 3 and discussed in Chapter 2. These existing bicycle facilities are not well-connected and do not provide immediate access to the project site. For immediate access to the project site on S El Camino Real and E 3 Avenue, bicycle riders would share the road with vehicles. The City's *Bicycle Master Plan* identifies a few additions to the bike network within the downtown area. Future bicycle lanes are proposed for 5th Avenue between Maple Street and S San Mateo Drive and Future signed bicycle routes are proposed for E 5th Avenue, S San Mateo Drive, and S B Street in the downtown area.

Potential Impacts on Bicycle, Pedestrian, and Transit Facilities

The project is located in downtown San Mateo with sidewalks and crosswalks provided at all intersections. Many bus stops are nearby, and the project is about a half mile from the San Mateo Caltrain Station. Existing transit services and pedestrian facilities around the project are good. Although the bicycle facilities are not well-connected, local roads such as S San Mateo Drive, S B Street, 2nd Avenue, and E 5th Avenue carry low traffic volumes and are conducive to bicyclists. The project would not result in changes to the existing bicycle, pedestrian, and transit facilities. Therefore, there would be no impacts to these facilities.

Transportation Demand Management Program

The project is located in downtown San Mateo and close to the San Mateo Caltrain Station. The project location by itself provides opportunities to access other nearby land uses, such as stores, restaurants, and apartments, by walking. Also, downtown location allows easy access to bus and rail transit. The advantages of the downtown location will reduce single occupancy vehicle trips generated by the project. The TDM programs recommended for the project to further encourage future tenants and employees taking alternative transportation modes (transit, bicycle, and carpool) to work are summarized in the list below. Details and implementation of the programs are provided in Chapter 8 of the report.

- Participation in Downtown Transportation Management Association
- Designating an Employee Transportation Coordinator
- Providing Alternative Transportation Information
- Implemetating Telecommute/Flexible Work Schedule Program
- Implemetating Guaranteed Ride Home Program
- Providing Trip Planning Services and Resources
- Providing Pre-Tax Commuter Benefits
- Providing Subsidized or Free Transit Passes
- Providing On-Site Bicycle Storage and Shower/Changing Facilities
- Providing Biking Financial Incentives
- Providing Rideshare Matching Services
- Providing Subsidized or Free Vanpools or Carpools

Table ES 1
Intersection Level of Service Summary

ID	Intersection Name	Existing Control[1]	Peak Hour	Existing Avg. Delay[2]	Existing LOS	Background Avg. Delay[2]	Background LOS	Background +2 E 3rd Ave Avg. Delay[2]	Background +2 E 3rd Ave LOS	Background+ Two Projects Avg. Delay[2]	Background+ Two Projects LOS	Cumulative[3] Avg. Delay[2]	Cumulative[3] LOS
1	Dartmouth Rd and W 3rd Ave	Signal	AM	4.2	A	4.2	A	4.2	A	4.2	A	4.3	A
			PM	5.8	A	5.8	A	5.8	A	5.8	A	6.2	A
2	S El Camino Real and 2nd Ave	Signal	AM	9.4	A	9.4	A	9.4	A	9.5	A	9.8	A
			PM	15.1	B	15.1	B	15.2	B	15.4	B	13.9	B
3	S El Camino Real and E 3rd Ave	Signal	AM	15.9	B	16.2	B	16.2	B	16.2	B	27.0	C
			PM	17.7	B	19.2	B	19.2	B	19.2	B	27.3	C
4	S El Camino Real and E 4th Ave	Signal	AM	16.4	B	18.2	B	18.1	B	18.1	B	16.0	B
			PM	20.1	C	20.7	C	20.8	C	20.8	C	37.0	D
5	S El Camino Real and E 5th Ave	Signal	AM	18.3	B	18.6	B	18.6	B	18.6	B	18.3	B
			PM	20.2	C	20.4	C	20.5	C	20.7	C	21.6	C
6	S El Camino Real and 9th Ave	Signal	AM	11.7	B	12.0	B	11.9	B	11.9	B	12.0	B
			PM	8.6	A	9.7	A	9.7	A	9.7	A	9.0	A
7	S San Mateo Dr and 2nd Ave	Signal	AM	11.7	B	11.7	B	11.7	B	11.7	B	11.8	B
			PM	11.8	B	11.8	B	11.8	B	11.8	B	12.7	B
8	S San Mateo Dr and E 3rd Ave	Signal	AM	11.0	B	11.1	B	11.2	B	11.2	B	16.1	B
			PM	10.2	B	10.2	B	10.3	B	10.3	B	20.7	C
9	S San Mateo Dr and E 4th Ave	Signal	AM	10.9	B	10.6	B	10.6	B	10.6	B	12.5	B
			PM	14.1	B	14.1	B	14.2	B	14.3	B	20.9	C
10	S San Mateo Dr and E 5th Ave	Signal	AM	7.8	A	7.9	A	8.0	A	8.0	A	9.7	A
			PM	9.1	A	9.3	A	9.3	A	9.4	A	11.4	B
11	S B St and E 3rd Ave	Signal	AM	8.8	A	8.8	A	8.8	A	8.8	A	11.5	B
			PM	10.0	A	10.0	A	10.0	A	10.0	A	17.4	B
12	S Delaware St and E 3rd Ave	Signal	AM	19.4	B	19.4	B	19.4	B	19.3	B	31.0	C
			PM	22.5	C	22.5	C	22.5	C	22.5	C	31.6	C
13	S Delaware St and E 4th Ave	Signal	AM	20.1	C	20.2	C	20.2	C	20.2	C	23.0	C
			PM	21.6	C	22.0	C	22.0	C	22.1	C	39.9	D
14	S Humboldt St and E 3rd Ave	Signal	AM	27.3	C	27.4	C	27.4	C	27.5	C	23.8	C
			PM	23.8	C	24.0	C	24.0	C	24.0	C	28.1	C
15	S Humboldt St and E 4th Ave	Signal	AM	20.3	C	20.3	C	20.3	C	20.3	C	30.8	C
			PM	19.1	B	19.1	B	19.1	B	19.1	B	28.6	C

Notes:

[1] Intersection control under existing conditions.
- Signal = signalized Intersection

[2] Overall weighted average control delay (seconds per vehicle) is reported for signalized intersections.
Worst stop-controlled approach delay (seconds per vehicle) is reported for two-way stop-controlled intersections.

[3] LOS and delay at study intersections, except #1, #2, #5, #6, and #7, is based on 2030 level of service analysis conducted for City of San Mateo General Plan. LOS and delay at intersections #1, #2, #5, #6, and #7 were updated for the study using volumes interpolated from the 2030 volumes at adjacent study intersections.

1. Introduction

This report presents the results of the traffic study for the proposed mixed-use development at 2 E 3rd Avenue in San Mateo, CA. The project site is located on an 8,604 square-foot vacant lot on the southeast corner of E 3rd Avenue and S El Camino Real. The project would build a 23,968 square-foot, three-story building with 20,025 square feet (s.f.) of office space on three floors and 3,943 s.f. of retail space on the ground floor. The project would not include any on-site parking spaces. Parking would be accommodated in existing downtown lots and garages.

The project site and the surrounding study area are shown on Figure 1. The proposed site plan is shown on Figure 2.

Scope of Study

The purpose of the traffic study is to identify potential traffic impacts related to the proposed development and to recommend improvements, if necessary. The impacts of the project were evaluated following the standards and methodologies set forth by the City of San Mateo and the City/County Association of Governments of San Mateo County (C/CAG). Since it is estimated that the project would generate fewer than 100 peak hour vehicle trips, preparation of a trip reduction plan in accordance with the C/CAG trip reduction checklist is not required.

The study determined traffic impacts of the proposed development on the following 15 signalized study intersections during the AM (7 – 9 AM) and PM (4 – 6 PM) peak commute periods of traffic. Because the project would not provide on-site parking spaces, it is expected that project-related vehicles would park at long-term and short-term parking spaces within walking distance of the project site in downtown San Mateo. Therefore, the study focused on analyzing these 15 intersections that provide access to public parking in the downtown area. None of the study intersections is part of the CMP roadway network.

1. Dartmouth Road and W 3rd Avenue
2. S El Camino Real and 2nd Avenue
3. S El Camino Real and E 3rd Avenue
4. S El Camino Real and E 4th Avenue
5. S El Camino Real and E 5th Avenue
6. S El Camino Real and 9th Avenue
7. S San Mateo Drive and E 2nd Avenue
8. S San Mateo Drive and E 3rd Avenue
9. S San Mateo Drive and E 4th Avenue
10. S San Mateo Drive and E 5th Avenue
11. S B Street and E 3rd Avenue
12. S Delaware Street and E 3rd Avenue

13. S Delaware Street and E 4th Avenue
14. S Humboldt Street and E 3rd Avenue
15. S Humboldt Street and E 4th Avenue

Traffic conditions were evaluated for the following scenarios:

Scenario 1: *Existing Conditions.* Existing traffic volumes were obtained from new traffic counts for eight of 15 study intersections. Traffic volumes for seven other intersections were obtained from recent traffic counts conducted in 2014 for the Essex Apartment project.

Scenario 2: *Background Conditions*. Background conditions reflect future traffic volumes on the existing roadway network. Background traffic volumes were estimated by adding to existing traffic volumes the projected volumes from approved but not yet constructed developments in the study area.

Scenario 3: *Background Plus Project Conditions.* Background plus project conditions reflect the future traffic volumes on the existing roadway network with implementation of the project. Background plus project traffic volumes were estimated by adding to background traffic volumes the trips associated with the proposed development. Background plus project conditions were evaluated relative to background conditions in order to determine potential project impacts.

Scenario 4: *Background Plus Two Projects Conditions.* Another development project on the northeast corner of 3rd Avenue and El Camino Real at 221 S El Camino Real is also undergoing the application process at the same time as the proposed project. This scenario reflects future traffic conditions with implementation of both projects together (2 E 3rd Avenue and 221 S El Camino Real). Project-generated traffic from both projects was added to background traffic volumes. Background plus two projects conditions were evaluated relative to background conditions in order to determine potential impacts of both projects together.

Scenario 5: 2030 *Cumulative Conditions.* 2030 Cumulative conditions reflect future traffic volumes on the future transportation network in accordance with the San Mateo General Plan. The 2030 level of service results from the San Mateo General Plan, which includes the proposed project, were used to describe traffic operation conditions at the study intersections under cumulative conditions. For study intersections not analyzed in the General Plan, traffic volumes were interpolated from 2030 volumes at adjacent intersections analyzed in the General Plan.

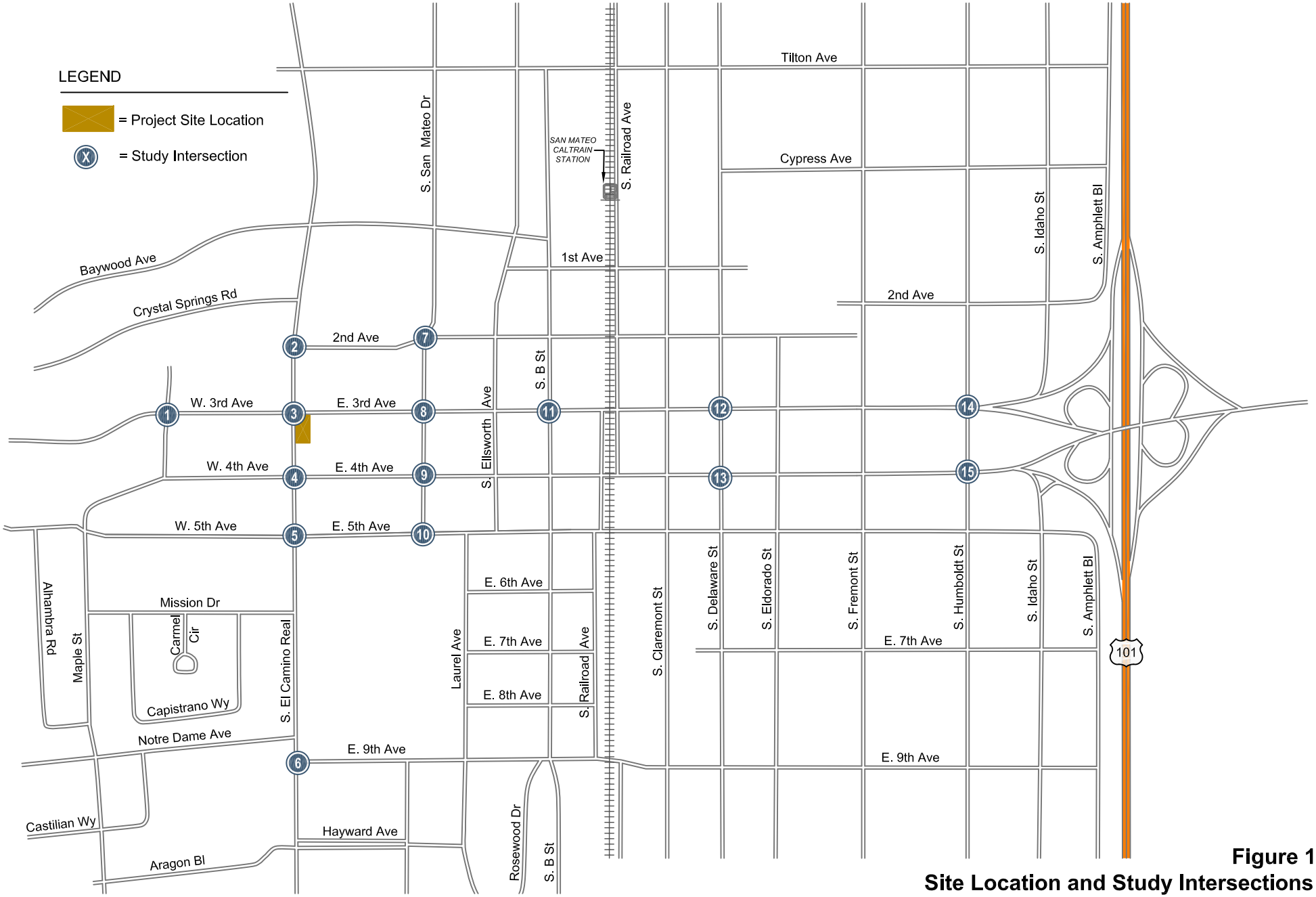

Figure 1
Site Location and Study Intersections

NORTH
Not to Scale

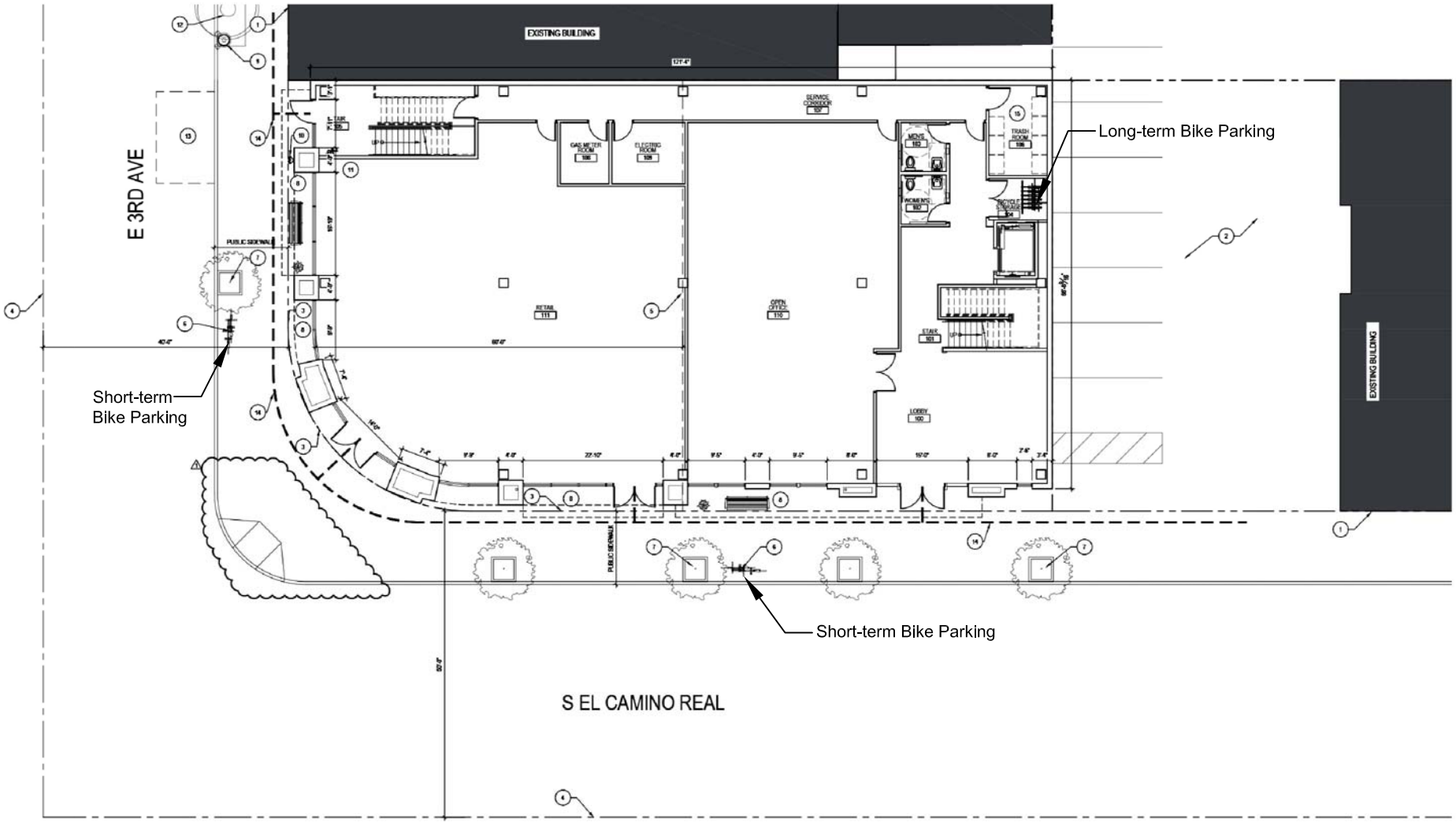

Figure 2
Proposed Site Plan

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Methodology

This section describes the methods used to determine the traffic conditions for each scenario described above. 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 field observations, new traffic counts, and the City of San Mateo staff. The following data were collected from these sources:

- Existing intersection peak-hour volumes
- Lane configurations
- Signal timing and phasing
- List of approved but not yet completed projects

Intersection Level of Service Methodologies

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

This study utilizes TRAFFIX software to determine intersection level of service. The TRAFFIX software is based on the 2000 Highway Capacity Manual (HCM) methodology for signalized intersections. This method evaluates intersection operations on the basis of average control delay time for all vehicles at the intersection. This average delay can then be correlated to a level of service. Table 1 presents the level of service definitions for signalized intersections.

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

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

Source: Transportation Research Board, *2000 Highway Capacity Manual* (Washington, D.C., 2000) p10-16.

Traffic Operation Standards and Significant Impact Criteria

Significance criteria are used to establish what constitutes an impact. Impacts on signalized intersections are based on the significance criteria and level of standards of the jurisdiction in which the intersection is located. For this analysis, significance criteria for impacts on signalized intersections are based on the City of San Mateo level of service standard, which is mid-LOS D (delay of 45 seconds) or better for all of the signalized study intersections.

Based on the City of San Mateo's General Plan Policy C 2.7, a project is considered to cause a significant impact if:

1) The acceptable level of service at the intersection (mid-level LOS D, with an average delay of more than 45 seconds) is exceeded by 4 seconds or more when the project traffic is added, and

2) An intersection that operates below its level of service standard under the base year conditions experiences an increase in delay of 4 or more seconds, and

3) The needed improvements of the intersection(s) are not funded in the applicable five-year City Capital Improvement Program from the date of application approval.

Report Organization

The remainder of this report is divided into seven chapters. Chapter 2 describes existing conditions, including the existing roadway network, transit service, and existing bicycle and pedestrian facilities. Chapter 3 presents the intersection levels of service under background conditions. Chapter 4 describes the method used to estimate project traffic, project impacts on the transportation system, and recommended mitigation measures under background plus project conditions. Chapter 5 identifies the impacts of the project and the adjacent 221 S El Camino Real development on the transportation system and recommended mitigation measures under background plus two projects conditions. Chapter 6 presents the intersection levels of service under cumulative conditions. Chapter 7 presents the analysis of other transportation related issues, including discussion of vehicle miles traveled (VMT) in accordance with SB 743 and potential impacts on bicycle, pedestrian and transit facilities. Chapter 8 presents the transportation demand management (TDM) programs that could be implemented for the project.

2. Existing Conditions

This chapter describes the existing conditions for all of the major transportation facilities in the vicinity of the site, including the roadway network, transit service, and bicycle and pedestrian facilities.

Roadway Network

Regional roadway facilities providing access to downtown San Mateo include US Highway 101 (US 101) and State Route 82 (SR 82, El Camino Real). Local roadways providing access include S San Mateo Drive, S B Street, S Delaware Street, 2nd Street, E 3rd Avenue, E 4th Avenue, and E 5th Avenue. Descriptions of each roadway facility are presented below.

US 101 is an 8-lane north-south freeway that extends north through San Francisco and south through San Jose. Access to the project site and the downtown is provided via its interchange with 3rd and 4th Avenues.

El Camino Real (SR 82) is a six-lane State arterial that extends from San Mateo County southerly to Santa Clara County. Near the project site, S El Camino Real is oriented in an approximately north-south direction. El Camino Real provides access to the project site and the downtown via its intersection with E 3rd Avenue and provides access to the downtown via 2nd Avenue, E 3rd Avenue, E 4th Avenue, and 5th Avenue.

S San Mateo Drive is a two-lane north-south local street within the project vicinity. S San Mateo Drive provides access to the project site via its intersection with E 3rd Avenue.

S B Street is a two-lane north-south collector within the project vicinity. S B Street provides access to the project site via its intersection with E 3rd Avenue.

S Delaware Street is a two-lane north-south arterial within the project vicinity. S Delaware Street provides access to the project site via its intersections with E 3rd Avenue and E 4th Avenue.

2nd Avenue is a two-lane east-south collector within the project vicinity. 2nd Avenue provides access to the project site via its intersections with El Camino Real and S San Mateo Drive.

E 3rd Avenue is a two-lane east-west arterial within the project vicinity. E 3rd Avenue receives traffic from US 101. E 3rd Avenue provides direct access to the project site. East of Delaware Street, E 3rd Avenue is one-way westbound.

E 4th Avenue is a four-lane east-west arterial within the project vicinity. E 4th Avenue feeds traffic onto US 101. E 4th Avenue provides access to the project site via its intersections with El Camino Real and S San Mateo Drive. East of Delaware Street, E 4th Avenue is one-way eastbound.

E 5th Avenue is a two-lane east-west collector street within the project vicinity. E 5th Avenue provides access to the project site via its intersections with El Camino Real and S San Mateo Drive.

Bicycle and Pedestrian Facilities

Within the vicinity of the project site, a Class I bicycle path (defined as separated off-street paths) exists on E 3th Avenue on the US 101 overpass between S Humboldt Street and S Norfolk Street. Class II bicycle lanes (defined as on-street striped bike lanes) exist on Laurel Avenue between E 5th Avenue and 9th Avenue, S Delaware Street south of E F5th Avenue, 9th Avenue east of S B Street, and W 3rd Avenue west of Dartmouth Road. Class III bicycle routes (defined as on-street signed routes in which bicycles share the roadway with vehicles) exist on W 3rd Avenue between Dartmouth Road and S El Camino Real and S Delaware Street north of E 5th Avenue. Although these bicycle facilities are not well-connected, local roads such as S San Mateo Drive, S B Street, 2nd Avenue, and E 5th Avenue carry low traffic volumes and are conducive to bicyclists. Existing bicycle facilities are shown on Figure 3. According to the City's *Bicycle Master Plan*, in the project vicinity, W 5th Avenue between Maple Street and S San Mateo Drive is proposed for Class II bicycle lanes; E 5th Avenue between S San Mateo Drive and S Humboldt Street, S San Mateo Drive between E 5th Avenue and W Poplar Avenue, and S B Street between 9th Avenue and Baldwin Avenue are all proposed for Class III signed bicycle routes.

Hexagon conducted bicycle counts at the study intersections, and determined that bicycle volumes at all study intersections are consistently low. During the AM peak period (7 AM to 9 AM), the southbound approach at the intersection of S B Street and E 3rd Avenue had the highest volume with 16 bicycles in the two-hour period. During the PM peak period (4 PM to 6 PM), the southbound approach at the intersection of S San Mateo Drive and E 3rd Avenue had the highest volume with 15 bicycles in the two-hour period. At most other study intersections, the bicycle volumes on each leg were around five to 12 bicycles during both the AM and PM peak periods. All bicycle counts are included in Appendix A.

Sidewalks are present on all roadway segments within the study area, and crosswalks are present at all study intersections with pedestrian signal heads on all approaches.

Hexagon conducted pedestrian counts at the study intersections, and determined that the study intersections have a high level of pedestrian volume during the AM and PM peak periods. During the AM peak hour, the west crossing at the intersection of S B Street and E 3rd Avenue had the highest volume with 109 pedestrians. During the PM peak hour, the pedestrian crossing at each leg at the intersections of S San Mateo Drive and E 3rd Avenue, S San Mateo Drive and E 4th Avenue, and S B Street and E 3rd Avenue had relatively high volumes of pedestrians (60 to 170 pedestrians). At most other study intersections, the pedestrian volumes on leg were around 20 to 60 pedestrians during both the AM and PM peak hours. All pedestrian counts are included in Appendix A.

Transit Service

Local and regional transit service in San Mateo is provided by the San Mateo County Transit District (SamTrans) and the commuter rail service, Caltrain. The transit services provided in the project vicinity are summarized below.

SamTrans

SamTrans primarily serves as a local transit provider within San Mateo County, but also provides local and regional services to neighboring Santa Clara and San Francisco Counties. The existing SamTrans service is described below and shown on Figure 5.

Route 250 operates on El Camino Real, 4th Avenue, S San Mateo Drive, and S Delaware Street in the project vicinity, providing service between downtown San Mateo, San Mateo Caltrain Station, and College of San Mateo. The line operates with a 30-minute headway during the AM and PM peak periods. The closest stop is at El Camino Real/4th Avenue.

Route 252 operates on El Camino Real, 4th Avenue, and S San Mateo Drive in the project vicinity, providing a loop service between downtown San Mateo, San Mateo Caltrain Station, North Shoreview Elementary School, and San Mateo County Court. The route operates with a 60-minute headway during the AM and PM peak periods. The closest stop is at El Camino Real/4th Avenue.

Route 292 is an express route and runs on S Delaware Street in the project vicinity. It provides service between San Francisco and Hillsdale Mall. This route operates with a 20- to 30-minute headway during both the AM and PM commute peak periods. The closest stop is at S Delaware Street/2nd Avenue.

Route 295 operates on E 4th Avenue in the project vicinity, providing service between the San Mateo Caltrain Station and the San Carlos Caltrain Station, with limited service to the Redwood City Transit Center. This route operates with a 30- to 55-minute headway during both the AM and PM commute peak periods. The closest stop is at El Camino Real/4th Avenue.

Route 397 is an express route and runs on El Camino Real in the project vicinity. It provides service between downtown San Francisco and the Redwood City Transit Station. This route operates only in the early morning period, and provides no service during the peak commute periods. The closest stop is at El Camino Real/2nd Avenue.

Route ECR is an express route and runs on El Camino Real in the project vicinity. It provides service between the Pal Alto Transit Center and the Daly City BART Station. This route operates with a 15-minute headway during the AM and PM commute peak periods. The closest stop is at El Camino Real/2nd Avenue.

Within the project site, the bus stops at El Camino Real/2nd Avenue, El Camino Real/4th Avenue, S San Mateo Drive/E 4th Avenue, and S San Mateo Drive/2nd Avenue are within 1,000 feet from the project site. Combined, these bus stops provide access to all transit services described above.

Caltrain

Caltrain is a regional, intercity commuter rail service between San Francisco and Santa Clara Counties. The project site is located about a half mile south of the San Mateo Caltrain Station, which is about a 20-minute walk. Caltrain provides service with approximately 20- to 30-minute headways during the weekday AM and PM commute hours and 60 minute headways midday, at nights and on weekends. Sidewalks exist on most of the streets between the project site and the Caltrain Station.

Intersection 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 manual peak-hour turning-movement counts on typical weekdays when schools were in session in April 2014 and February 2015 (see Figure 6). The intersection counts include vehicles, bicycles, and pedestrians during the morning peak commute period (7:00 – 9:00 AM) and afternoon peak commute period (4:00 – 6:00 PM). The traffic count data are included in Appendix A. Peak hour intersection turning movement volumes for all intersections and study scenarios are tabulated in Appendix B.

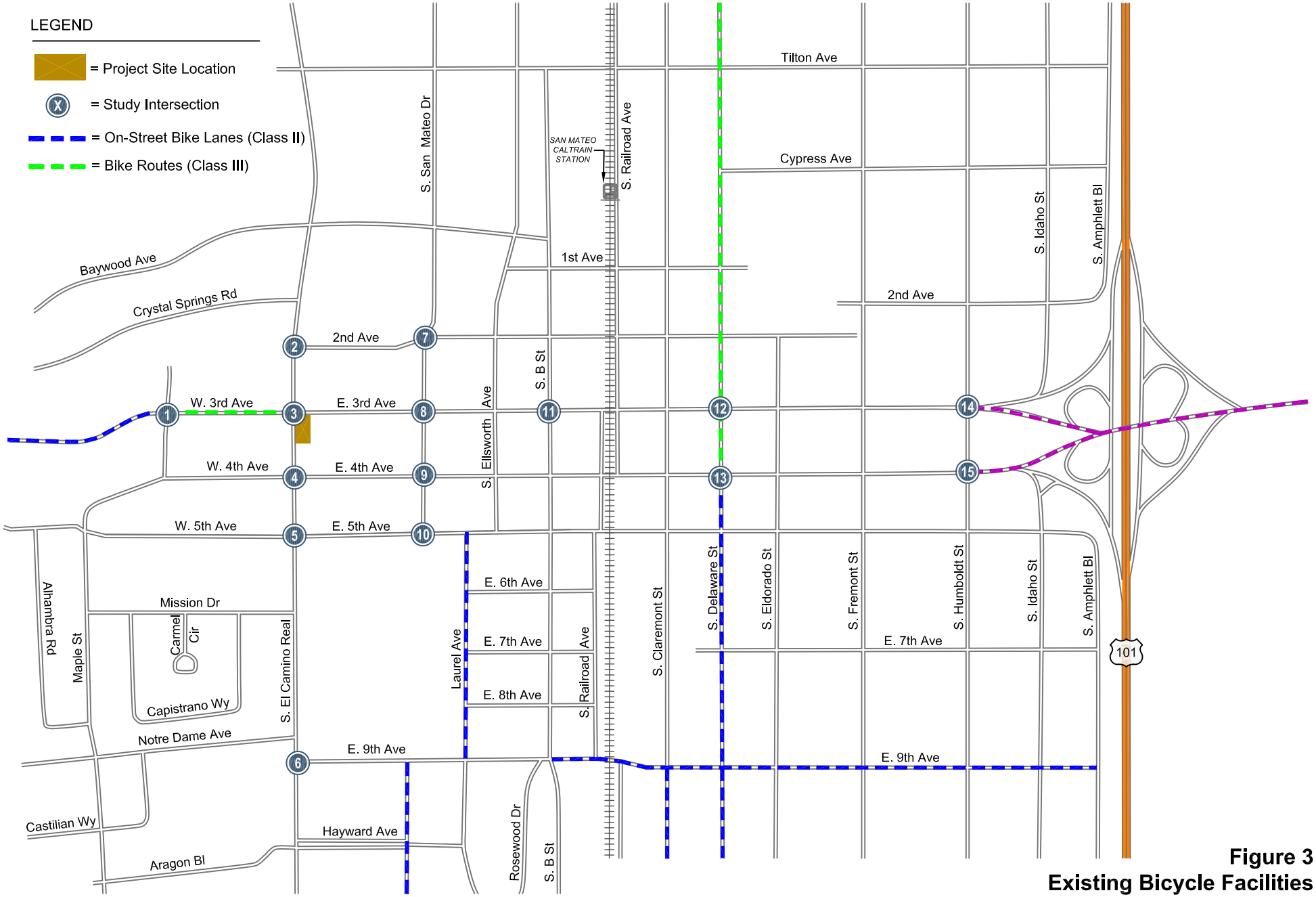

Figure 3
Existing Bicycle Facilities

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NORTH
Not to Scale

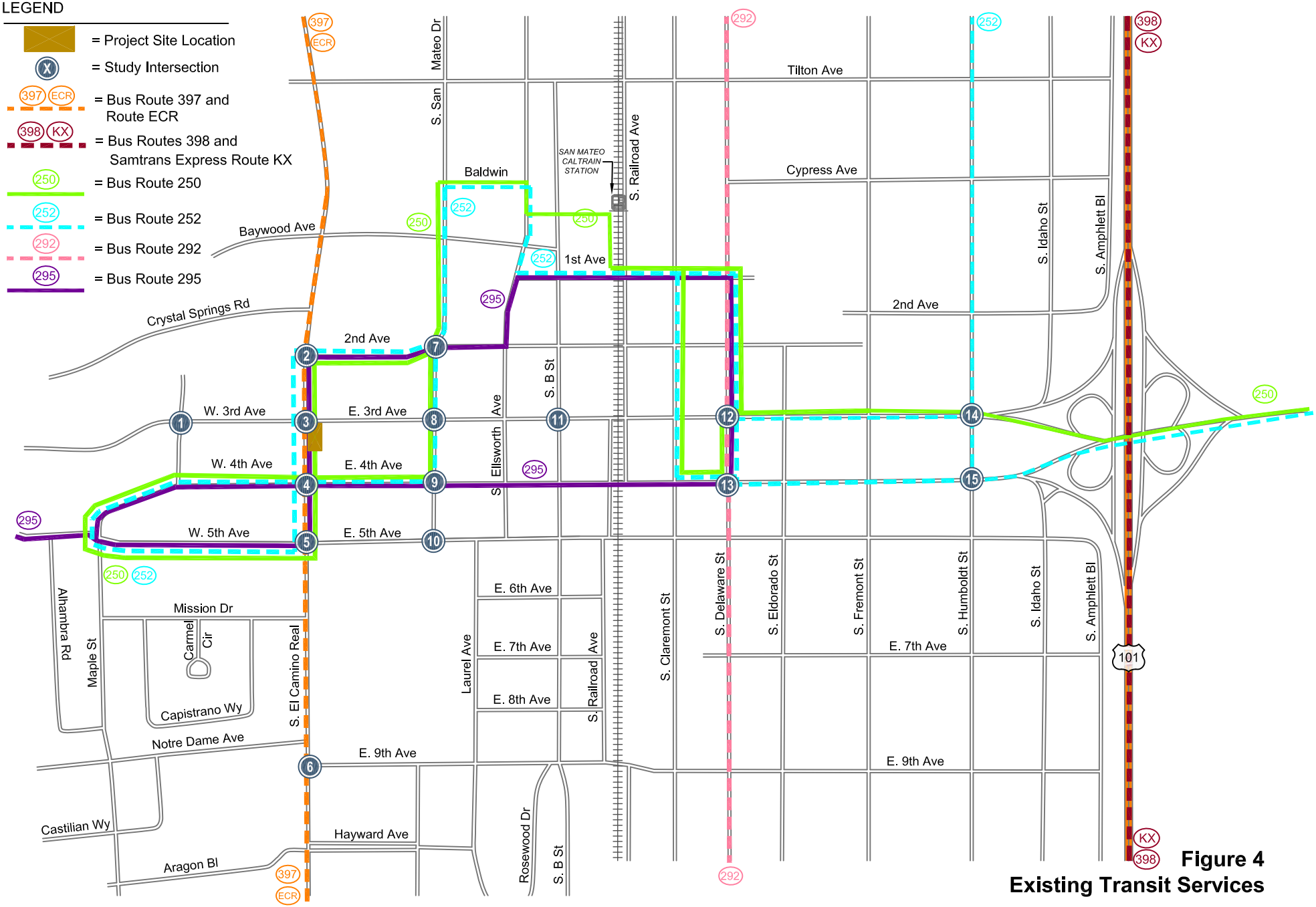


Figure 4
Existing Transit Services

NORTH
Not to Scale

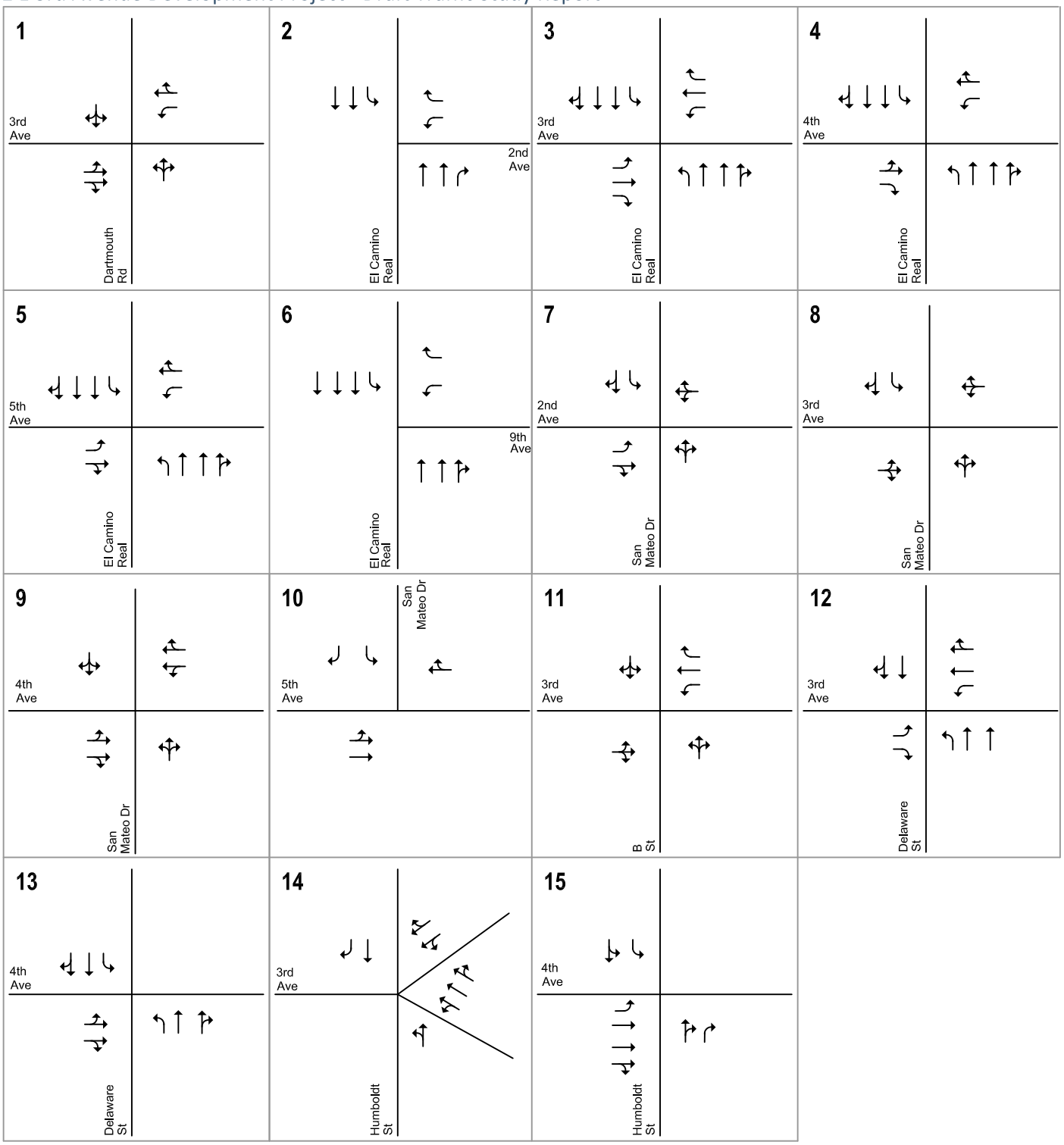
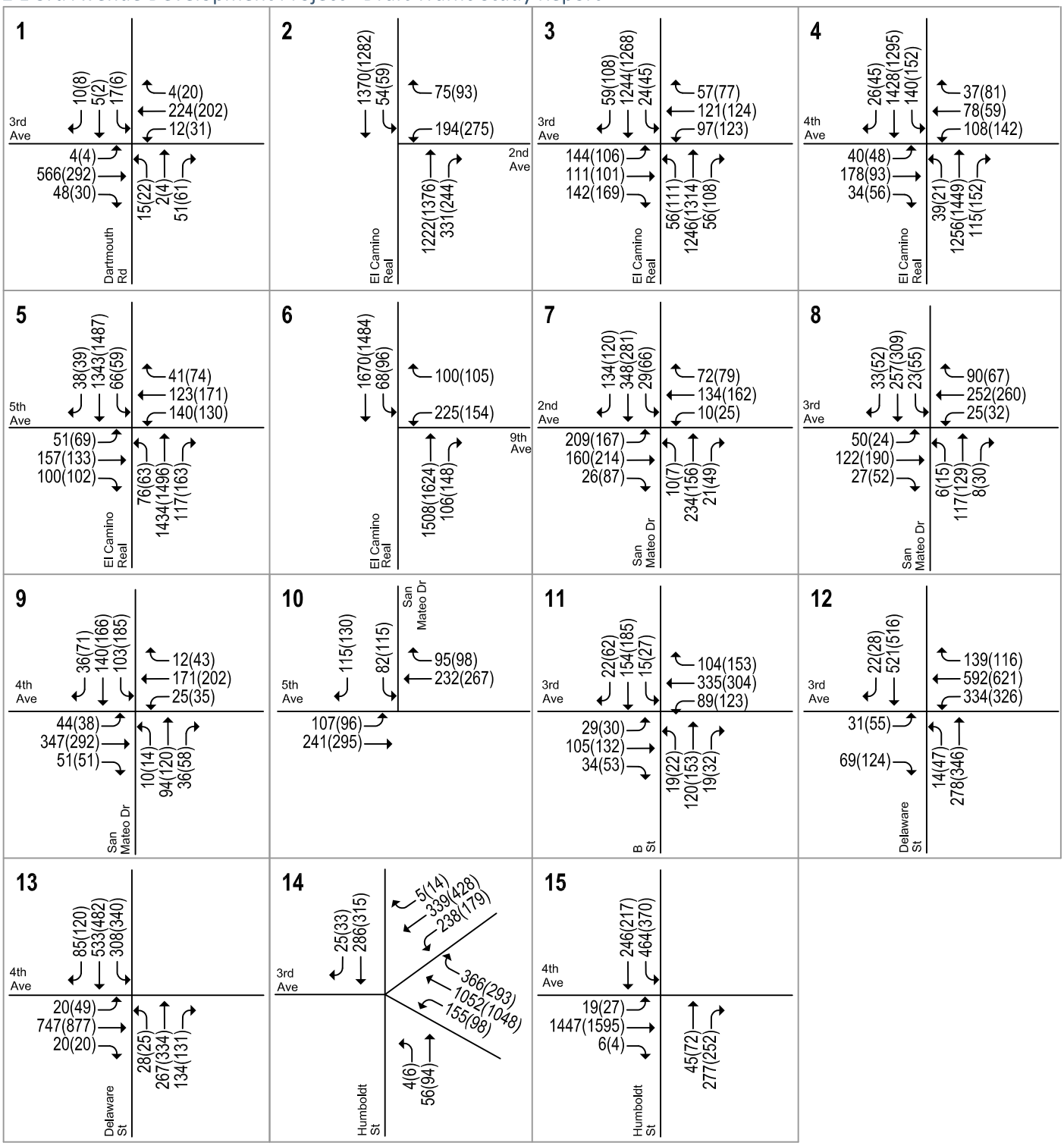


Figure 5
Existing Lane Configurations

NORTH
Not to Scale



LEGEND

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

Figure 6
Existing Traffic Volumes

NORTH
Not to Scale

Intersection Levels of Service

Table 2 shows the results of the intersection level of service analysis under existing conditions. The level of service calculation sheets are included in Appendix C. Under existing conditions, all study intersections are operating at level of service C or better.

Table 2
Existing Intersection Levels of Service

ID	Intersection	Existing Control[1]	Peak Hour	Count Date	Avg. Delay[2]	LOS
1	Dartmouth Rd and W 3rd Ave	Signal	AM	02/10/15	4.2	A
			PM	02/10/15	5.8	A
2	S El Camino Real and 2nd Ave	Signal	AM	02/10/15	9.4	A
			PM	02/10/15	15.1	B
3	S El Camino Real and E 3rd Ave	Signal	AM	04/29/14	15.9	B
			PM	04/29/14	17.7	B
4	S El Camino Real and E 4th Ave	Signal	AM	04/29/14	16.4	B
			PM	04/29/14	20.1	C
5	S El Camino Real and E 5th Ave	Signal	AM	04/29/14	18.3	B
			PM	04/29/14	20.2	C
6	S El Camino Real and 9th Ave	Signal	AM	04/29/14	11.7	B
			PM	04/29/14	8.6	A
7	S San Mateo Dr and 2nd Ave	Signal	AM	02/10/15	11.7	B
			PM	02/10/15	11.8	B
8	S San Mateo Dr and E 3rd Ave	Signal	AM	04/29/14	11.0	B
			PM	04/29/14	10.2	B
9	S San Mateo Dr and E 4th Ave	Signal	AM	04/29/14	10.9	B
			PM	04/29/14	14.1	B
10	S San Mateo Dr and E 5th Ave	Signal	AM	04/29/14	7.8	A
			PM	04/29/14	9.1	A
11	S B St and E 3rd Ave	Signal	AM	02/10/15	8.8	A
			PM	02/10/15	10.0	A
12	S Delaware St and E 3rd Ave	Signal	AM	02/10/15	19.4	B
			PM	02/10/15	22.5	C
13	S Delaware St and E 4th Ave	Signal	AM	02/10/15	20.1	C
			PM	02/10/15	21.6	C
14	S Humboldt St and E 3rd Ave	Signal	AM	02/10/15	27.3	C
			PM	02/10/15	23.8	C
15	S Humboldt St and E 4th Ave	Signal	AM	02/10/15	20.3	C
			PM	02/10/15	19.1	B

Notes:
[1] Intersection control under existing conditions.
- Signal = signalized Intersection

[2] Overall weighted average control delay (seconds per vehicle) is reported for signalized intersections.

Observed Traffic Conditions

Traffic conditions in the field were observed in order to identify existing operational deficiencies and to confirm the accuracy of calculated intersection levels of service. The purpose of this effort was (1) to identify any

existing traffic problems that may not be directly related to level of service, and (2) to identify any locations where the level of service analysis does not accurately reflect existing traffic conditions.

No significant intersection operational deficiencies were observed in the AM peak hours. Hexagon observed minor operational issues at a few intersections. The northbound through traffic at the intersection of El Camino Real and E 4th Avenue occasionally queued past E 5th Street, but all vehicles cleared within one cycle. At this intersection, the southbound through traffic also occasionally queued past E 3rd Avenue, and the southbound left-turn pocket occasionally overflowed. However, all traffic was able to clear within one cycle. At the intersection of S San Mateo Drive and E 3rd Avenue, traffic on the westbound leg experienced lengthy queues and temporarily backed up past S Ellsworth Street to the east, but the queue was able to clear within one cycle.

During the PM peak hour, at the intersection of El Camino Real and E 5th Avenue, the westbound left-turn lane consistently experienced high traffic volume, and required two cycles to clear. At this intersection, the northbound and eastbound left-turn pockets also occasionally experienced pocket overflows, but traffic was able to clear within one cycle. Overall, traffic on El Camino Real was able to clear within one cycle with slightly longer delay experienced on the minor street (E 5th Avenue), which is consistent with the level of service analysis for the intersection (LOS C shown in Table 2). At the intersection of El Camino Real and E 3rd Avenue, the northbound and southbound through traffic temporarily backed up past E 5th Avenue and 2nd Avenue, respectively, during the initial seconds of each green cycle, but all clears within one cycle. The temporary queues also blocked the respective left-turn pockets. Overall, observed traffic conditions at the El Camino Real/E 5th Avenue intersection appeared to be consistent with the level of service analysis for the intersection (LOS B). At the intersection of S San Mateo Drive and E 3rd Avenue, the southbound through movement occasionally experienced lengthy delays that required two cycles to clear. This queue was mainly caused by the driveway to the Central Parking Garage between E 3rd Avenue and E 4th Avenue. Overall, traffic on all other directions was able to clear within one cycle with slightly longer delay experienced on the southbound approach, which is consistent with the level of service analysis for the intersection (LOS B). At the intersection of S Humboldt St and E 4th Avenue, the eastbound through traffic occasionally queued past St Grant Street, but was able to clear within one cycle, which appeared to be consistent with the level of service analysis for the intersection (LOS B).

3. Background Conditions

This chapter describes background traffic conditions, which reflect future traffic volumes on the existing roadway network. Background traffic volumes reflect traffic generated by approved but not yet constructed developments in the vicinity of the project site and by two proposed but not yet approved (pending) developments in downtown San Mateo near the project site. This chapter describes the procedure used to determine background traffic volumes and the resulting traffic conditions.

Roadway Network

It is assumed in this analysis that the transportation network under background conditions would be the same as the existing transportation network.

Approved and Pending Developments

Background traffic volumes were forecast by estimating trip generation for a list of approved but not-constructed projects as listed on the City Planning webpage. Additionally, two proposed but not yet approved (pending) developments located near the project were included in background conditions, as requested by the City. Following is the list of approved and pending projects within the vicinity of the project that are included in the background scenario:

Approved Developments

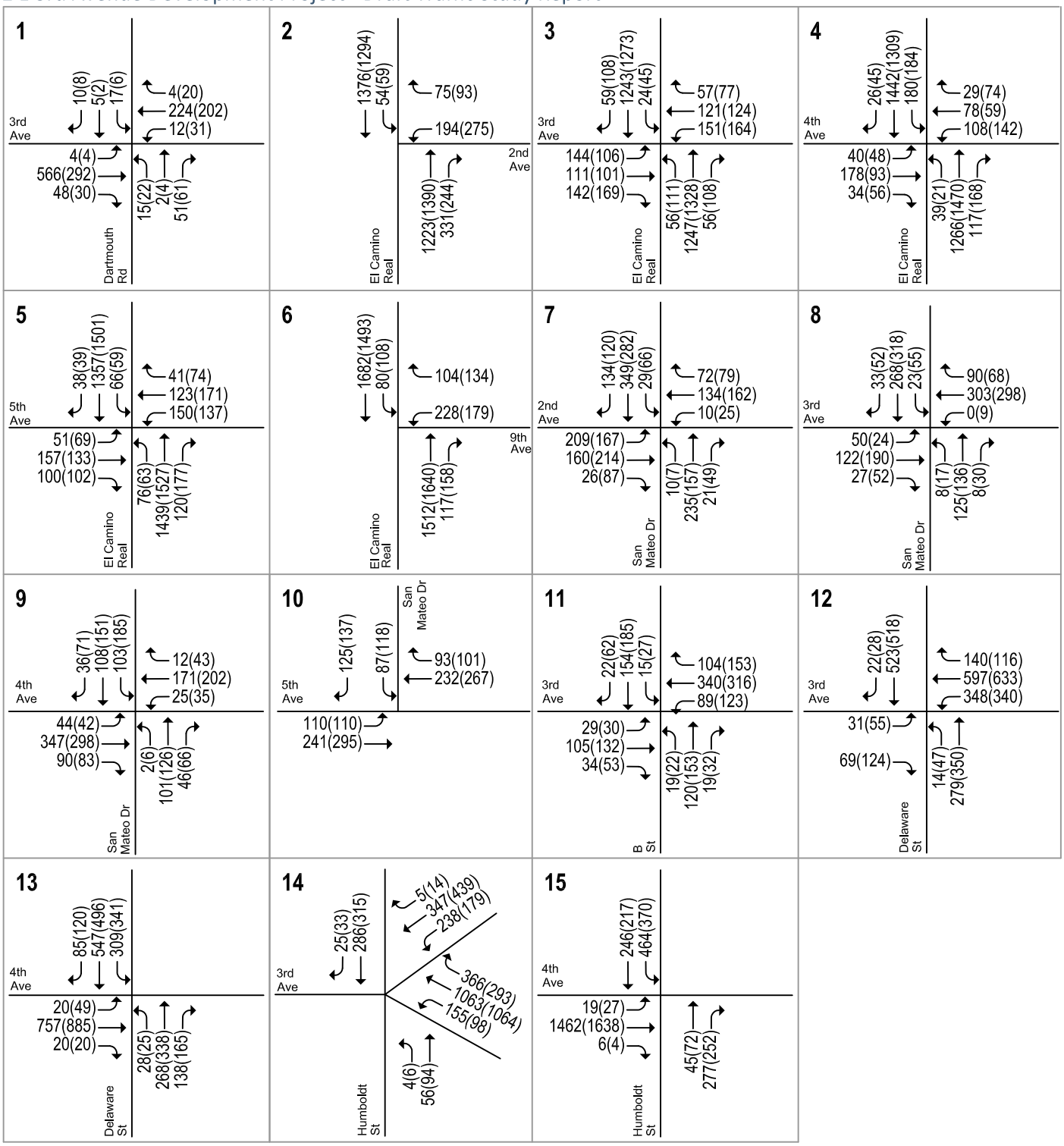
- Classic Communities (106, 110, 120 Tilton Avenue) – 27 unit multi-family residential building with underground parking. Site currently contains a 22-unit residential apartment that would be replaced. The project was approved on November 25, 2014.
- Mi Rancho Market (80 N B Street) – The project consists of replacing the former Blu and White Laundry building with a new two-story building of approximately 12,500 s.f. with 25 on-site parking spaces. The project was approved on June 15, 2013.

Pending Developments

- Central Park South (885 S El Camino Real) – This project proposes to replace the existing buildings on the four parcels along 9th Avenue with an office building of 33,544 s.f. and a residential building with 60 apartments.
- Essex at Central Park (northwest corner of E 5th Avenue and S San Mateo Drive) – The project consists of replacing the existing parking lot with an 80-unit residential apartment development.

Intersection Traffic Volumes

Background peak-hour traffic volumes were calculated by adding to existing volumes the estimated traffic from the approved and pending developments. Vehicle trips from the each of the projects were obtained from the project's traffic impact study (TIA). The estimated trips were assigned to the study intersections according to distributions identified in the development TIAs. The trips assigned to the study intersections are tabulated in Appendix B. Background traffic volumes are shown on Figure 7.



LEGEND

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

Figure 7
Background Traffic Volumes

Intersection Levels of Service

The results of the intersection level of service analysis under the background conditions are summarized in Table 3. The level of service calculation sheets are included in Appendix C. Under background conditions, all study intersections are expected to operate at LOS C or better during the AM and PM peak hours.

Table 3
Intersection Levels of Service Under Background Conditions

ID	Intersection	Existing Control[1]	Peak Hour	Existing Avg. Delay[2]	Existing LOS	Background Avg. Delay[2]	Background LOS
1	Dartmouth Rd and W 3rd Ave	Signal	AM	4.2	A	4.2	A
			PM	5.8	A	5.8	A
2	S El Camino Real and 2nd Ave	Signal	AM	9.4	A	9.4	A
			PM	15.1	B	15.1	B
3	S El Camino Real and E 3rd Ave	Signal	AM	15.9	B	16.2	B
			PM	17.7	B	19.2	B
4	S El Camino Real and E 4th Ave	Signal	AM	16.4	B	18.2	B
			PM	20.1	C	20.7	C
5	S El Camino Real and E 5th Ave	Signal	AM	18.3	B	18.6	B
			PM	20.2	C	20.4	C
6	S El Camino Real and 9th Ave	Signal	AM	11.7	B	12.0	B
			PM	8.6	A	9.7	A
7	S San Mateo Dr and 2nd Ave	Signal	AM	11.7	B	11.7	B
			PM	11.8	B	11.8	B
8	S San Mateo Dr and E 3rd Ave	Signal	AM	11	B	11.1	B
			PM	10.2	B	10.2	B
9	S San Mateo Dr and E 4th Ave	Signal	AM	10.9	B	10.6	B
			PM	14.1	B	14.1	B
10	S San Mateo Dr and E 5th Ave	Signal	AM	7.8	A	7.9	A
			PM	9.1	A	9.3	A
11	S B St and E 3rd Ave	Signal	AM	8.8	A	8.8	A
			PM	10	A	10.0	A
12	S Delaware St and E 3rd Ave	Signal	AM	19.4	B	19.4	B
			PM	22.5	C	22.5	C
13	S Delaware St and E 4th Ave	Signal	AM	20.1	C	20.2	C
			PM	21.6	C	22.0	C
14	S Humboldt St and E 3rd Ave	Signal	AM	27.3	C	27.4	C
			PM	23.8	C	24.0	C
15	S Humboldt St and E 4th Ave	Signal	AM	20.3	C	20.3	C
			PM	19.1	B	19.1	B

Notes:
[1] Intersection control under existing conditions.
- Signal = signalized Intersection

[2] Overall weighted average control delay (seconds per vehicle) is reported for signalized intersections.

4.
Background Plus Project Conditions

This chapter describes background traffic conditions that would occur when the project is complete. Background plus project conditions include the addition of traffic expected to be generated by the proposed development. Background plus project conditions were evaluated relative to background conditions in order to determine potential project impacts.

Roadway Network

It is assumed in this analysis that the transportation network under background plus project conditions, including roadways and intersection lane configurations, would be the same as that described under existing conditions.

Project Trip Estimates

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

Trip Generation

Through empirical research, data have been collected that correlate trip making to building size for various land use types. For many types of land uses, there are standard trip generation rates that can be applied to help predict the future traffic increases that would result from a new development. The standard trip generation rates are published in the Institute of Transportation Engineers (ITE) *Trip Generation Manual*.

Project trips associated with the proposed office and retail uses are estimated based on average trip generation rates obtained from ITE *Trip Generation Manual*, 9th Edition, for general offices (Land Use 710) and shopping centers (Land Use 820). Since this project is located within downtown San Mateo, and has good pedestrian facilities as well as transit services, Hexagon estimates that approximately 15% of all office trips would use alternative modes of transportation. Hexagon arrived at the 15% trip reduction factor based on the trip surveys for urban infill, mixed-use, and transit-oriented developments published in the Caltrans' Trip-Generation Rates for *Urban Infill Land Uses in California*, June 2009. The Caltrans study indicated that the observed trip rates for a general office building in downtown San Francisco were 22 – 38% lower than the ITE trip rates. Downtown San Mateo is served by fewer transit routes and has cheaper parking fees than San Francisco. Therefore, the office trip reduction for the project is assumed to be lower than the observed reduction in San Francisco. The retail space is assumed to serve mainly the nearby businesses and

residents. Hexagon has thus applied a 50% trip reduction to the retail trips. The non-auto trips would instead be accomplished through walking, biking, or taking transit. After applying the trip reduction, the project is expected to generate a total of 28 trips (24 in and 4 out) during the AM peak hour and 32 trips (7 in and 25 out) during the PM peak hour (see Table 4).

Table 4
Project Trip Generation Estimates

					AM Peak Hour						PM Peak Hour					
					Pk-Hr	Splits					Pk-Hr	Splits				
Land Use	Size	Units	Daily Rates	Daily Trips	Rate	In	Out	In	Out	Total	Rate	In	Out	In	Out	Total
Proposed Uses (2 E 3rd Avenue)																
Office[1]	20,025	s.f.	11.0	221	1.56	88%	12%	27	4	31	1.49	17%	83%	5	25	30
- 15% Urban Infill/TOD Trip Reduction[3]				*-33*				*-4*	*-1*	*-5*				*-1*	*-4*	*-5*
Retail[2]	3,943	s.f.	42.7	168	0.96	62%	38%	2	2	4	3.71	48%	52%	7	8	15
- 50% Downtown Retail Trip Reduction[4]				*-84*				*-1*	*-1*	*-2*				*-4*	*-4*	*-8*
Total Net New Trips:				**272**				**24**	**4**	**28**				**7**	**25**	**32**

Notes:
All trip rates are based on Institute of Traffic Engineers (ITE), *Trip Generation Manual*, 9th Edition, 2012.
[1] Land Use Code 710 (General Office), average rates expressed in trips per 1,000 square feet (s.f.) gross leasable area.
[2] Land Use Code 820 (Shopping Center), average rates expressed in trips per 1,000 s.f. gross leasable area.
[3] A reduction was applied to office trips based on the trip surveys for urban Infill, mixed-use, and transit-oriented developments (TOD) published in Caltrans' *Trip-Generation Rates for Urban Infill Land Uses in California*, June 2009.
[4] A reduction was applied retail trips based on the observation of retail uses in San Mateo downtown area.

Trip Distribution and Assignment

The trip distribution pattern for the proposed development was estimated based on existing travel patterns on the surrounding roadway system and the locations of complementary land uses. Because the project would not provide on-site parking spaces, it is assumed that most project-related trips would be oriented to and from parking garages within walking distance of the project site, which include El Camino Real/2nd Avenue, Central Parking, and the Tennis Court garages. The assumed trip distribution pattern for office and retail uses is shown in Figure 8. The retail trip distribution pattern is assumed to be different than the office trip distribution pattern because retail trips tend to be localized trips and assess the project site via local streets. The net peak-hour trips generated by the project were assigned to the roadway system in accordance with the trip distribution patterns. Figure 9 shows the assignment of project trips at each study intersection.

Intersection Traffic Volumes

The project trip estimates, as represented in the above project trip assignment, were added to the background traffic volumes (described in Chapter 4) to derive the background plus project traffic volumes. Figure 10 shows the intersection turning-movement volumes under background plus project conditions.

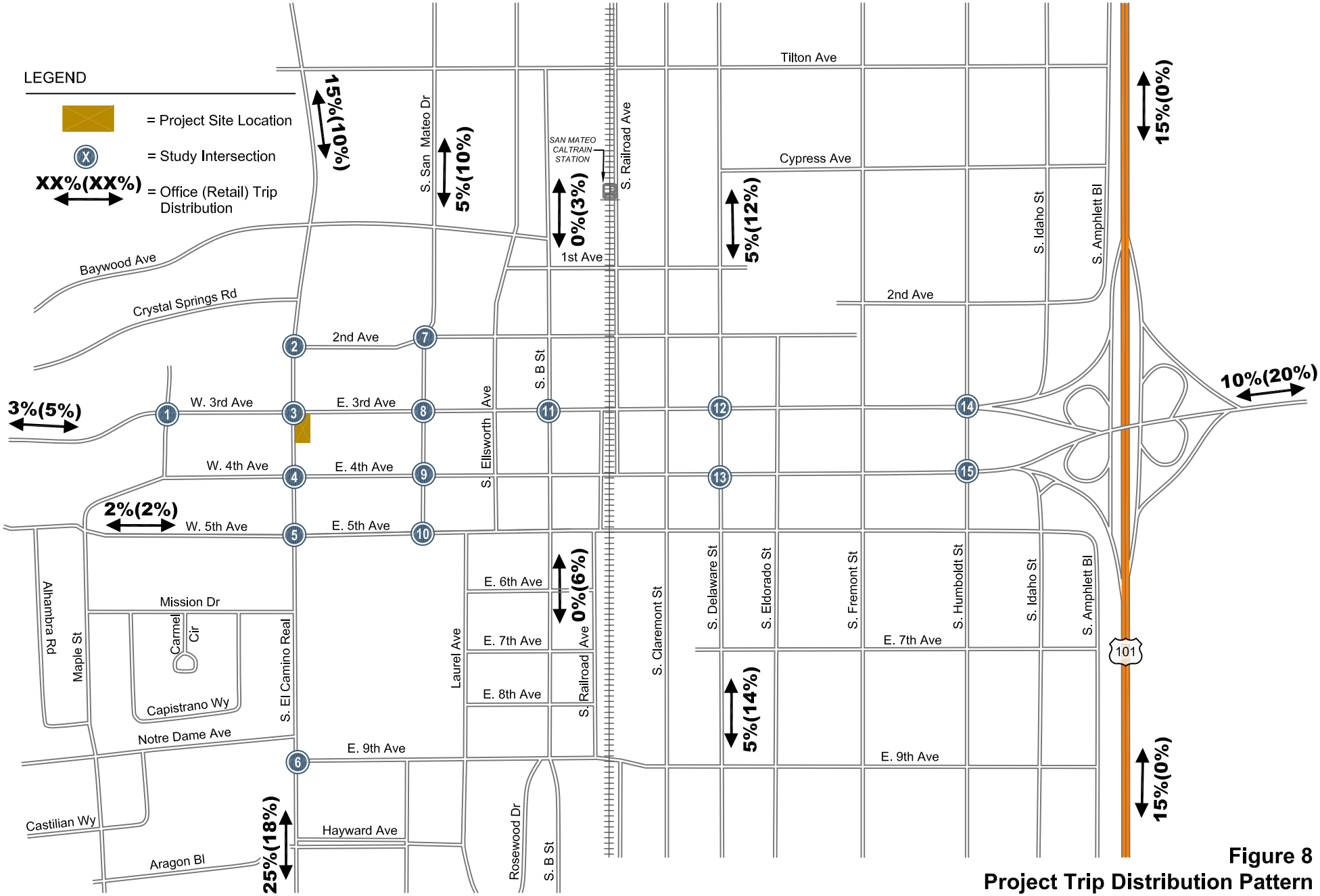
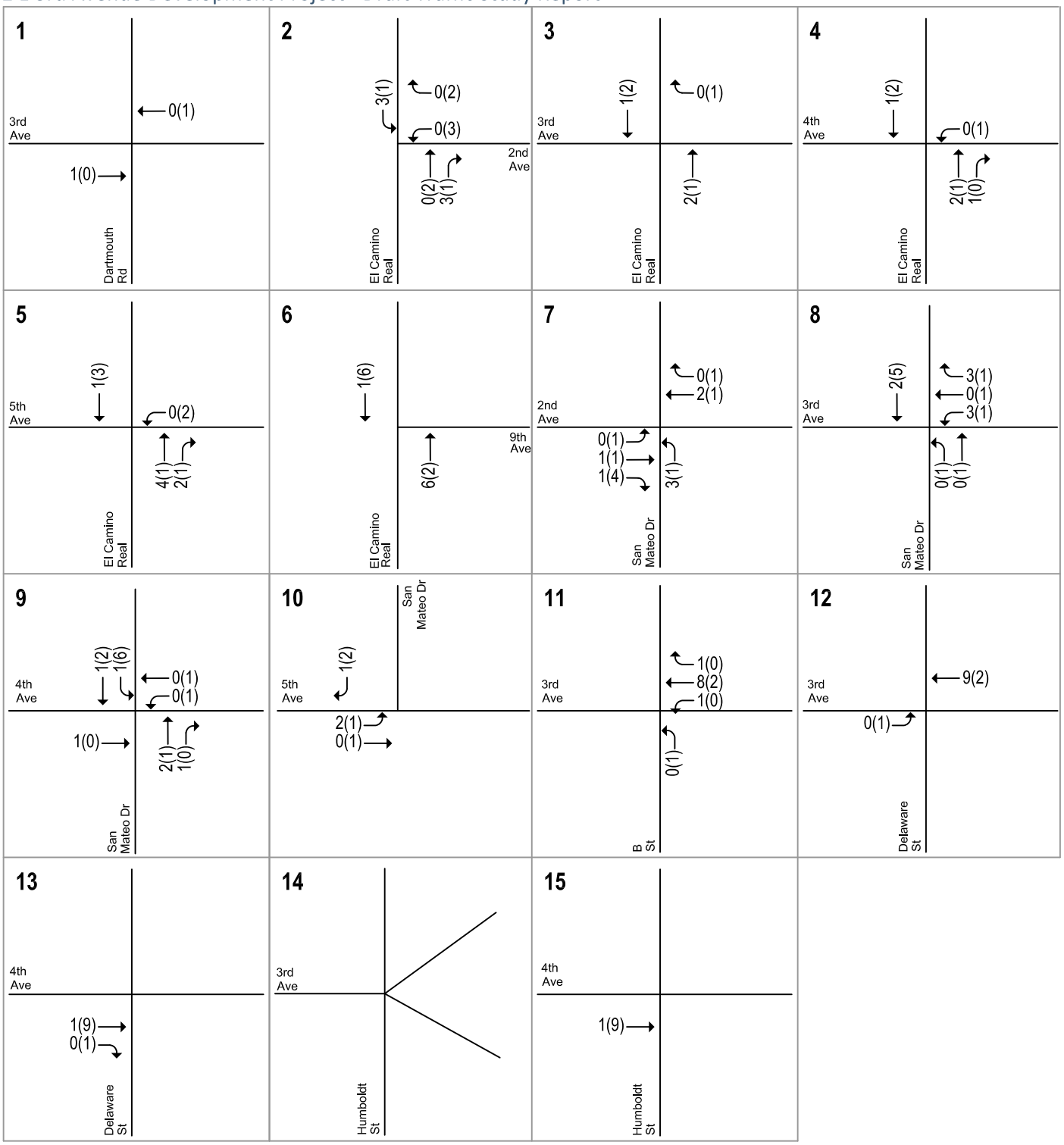


Figure 8
Project Trip Distribution Pattern

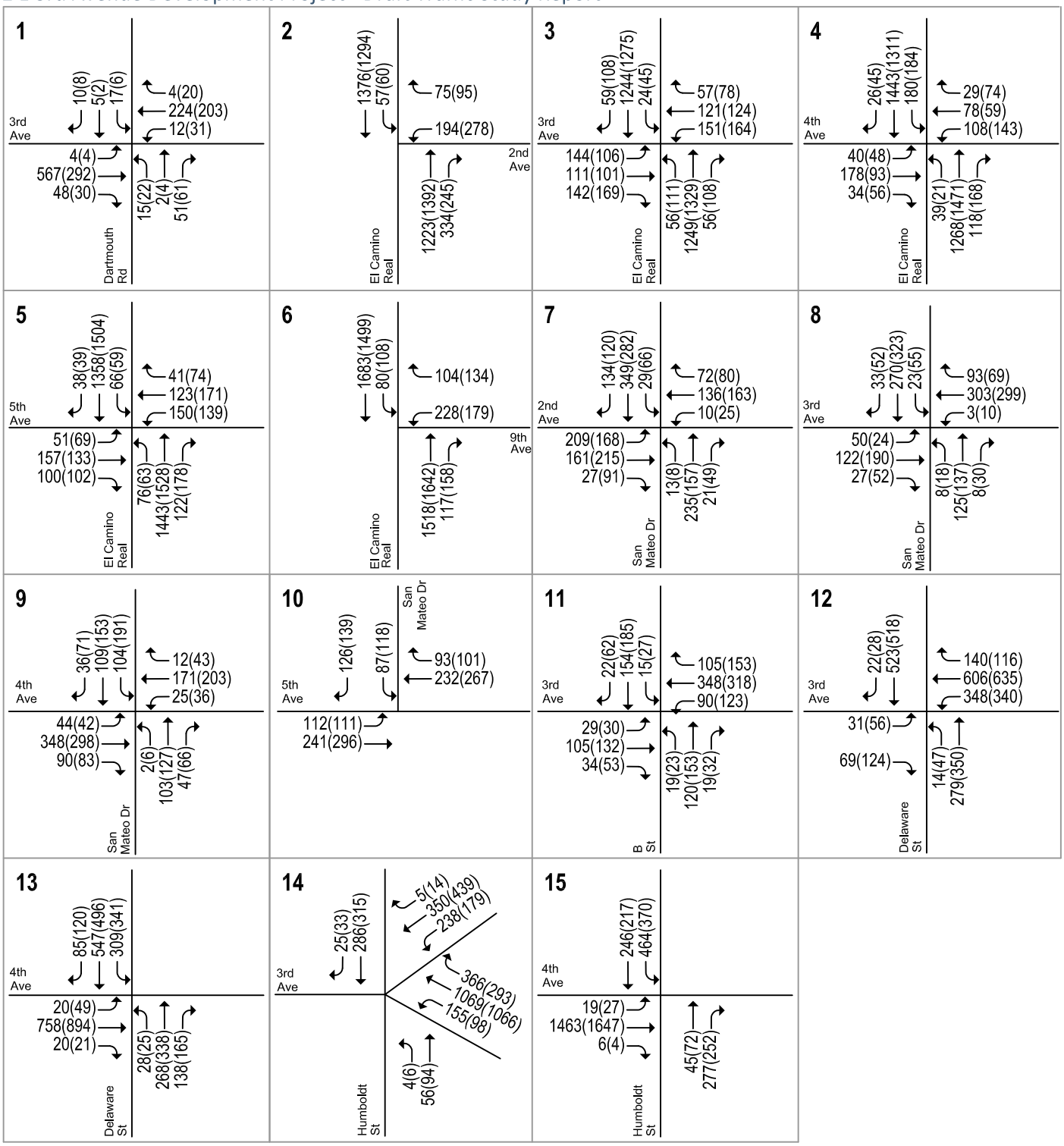


LEGEND

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

Figure 9
Project Trip Assignment

NORTH
Not to Scale



LEGEND

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

Figure 10
Background Plus Project Traffic Volumes

Intersection Levels of Service

The results of the intersection level of service analysis under background plus project conditions are summarized in Table 5. The intersection level of service calculation sheets are included in Appendix C. The results show that under background plus project conditions, all study intersections are expected to operate at LOS C or better during the AM and PM peak hours. At S El Camino Real/E 4th Avenue and S El Camino Real/ 9th Avenue, the average delay was estimated to decrease slightly with the addition of project traffic during the AM peak hour. This is because the average delay values shown in the table are weighted averages. Weighted average delays can decrease when traffic is added to a movement with a low delay.

Table 5
Background Plus Project Intersection Levels of Service

				Background		Background+2 E 3rd		
ID	Intersection	Control[1]	Peak Hour	Avg. Delay[2]	LOS	Avg. Delay[2]	LOS	Incr. In Avg. Delay
1	Dartmouth Rd and W 3rd Ave	Signal	AM	4.2	A	4.2	A	0.0
			PM	5.8	A	5.8	A	0.0
2	S El Camino Real and 2nd Ave	Signal	AM	9.4	A	9.4	A	0.0
			PM	15.1	B	15.2	B	0.1
3	S El Camino Real and E 3rd Ave	Signal	AM	16.2	B	16.2	B	0.0
			PM	19.2	B	19.2	B	0.0
4	S El Camino Real and E 4th Ave	Signal	AM	18.2	B	18.1	B	-0.1
			PM	20.7	C	20.8	C	0.1
5	S El Camino Real and E 5th Ave	Signal	AM	18.6	B	18.6	B	0.0
			PM	20.4	C	20.5	C	0.1
6	S El Camino Real and 9th Ave	Signal	AM	12.0	B	11.9	B	-0.1
			PM	9.7	A	9.7	A	0.0
7	S San Mateo Dr and 2nd Ave	Signal	AM	11.7	B	11.7	B	0.0
			PM	11.8	B	11.8	B	0.0
8	S San Mateo Dr and E 3rd Ave	Signal	AM	11.1	B	11.2	B	0.1
			PM	10.2	B	10.3	B	0.1
9	S San Mateo Dr and E 4th Ave	Signal	AM	10.6	B	10.6	B	0.0
			PM	14.1	B	14.2	B	0.1
10	S San Mateo Dr and E 5th Ave	Signal	AM	7.9	A	8.0	A	0.1
			PM	9.3	A	9.3	A	0.0
11	S B St and E 3rd Ave	Signal	AM	8.8	A	8.8	A	0.0
			PM	10.0	A	10.0	A	0.0
12	S Delaware St and E 3rd Ave	Signal	AM	19.4	B	19.4	B	0.0
			PM	22.5	C	22.5	C	0.0
13	S Delaware St and E 4th Ave	Signal	AM	20.2	C	20.2	C	0.0
			PM	22.0	C	22.0	C	0.0
14	S Humboldt St and E 3rd Ave	Signal	AM	27.4	C	27.4	C	0.0
			PM	24.0	C	24.0	C	0.0
15	S Humboldt St and E 4th Ave	Signal	AM	20.3	C	20.3	C	0.0
			PM	19.1	B	19.1	B	0.0

Notes:
[1] Intersection control under existing conditions.
- Signal = signalized Intersection

[2] Overall weighted average control delay (seconds per vehicle) is reported for signalized intersections.

5.
Background Plus Two Projects Conditions

This chapter describes background traffic conditions with implementation of the proposed project (2 E 3 Avenue) and the adjacent development (221 S El Camino Real). The 221 S El Camino Real development is located on a 0.28-acre vacant lot on the northeast corner of 3rd Avenue and El Camino Real across E 3rd Avenue from the proposed project. The development would build a 32,499 square-foot, three-story building with 21,087 square feet (s.f.) of office space on three floors and 11,412 s.f. of retail space on the ground floor. The development also would not include any on-site parking spaces. The 221 S El Camino Real development is also undergoing the application process at the same time as the proposed project, and is assumed to be occupied at same time as the project. The background plus two projects scenario evaluates the combined impacts of both projects together. Background plus two projects conditions were evaluated relative to background conditions.

Roadway Network

It is assumed in this analysis that the transportation network under background plus project conditions, including roadways and intersection lane configurations, would be the same as that described under existing conditions.

Project Trip Estimates

Trip generation, distribution, and assignment for the two projects (2 E 3 Avenue and 221 S El Camino Real) were estimated using the method described in Chapter 4. After applying the trip reduction, both projects together are expected to generate a total of 61 trips (52 in and 9 out) during the AM peak hour and 79 trips (21 in and 58 out) during the PM peak hour (see Table 6). The trips assigned to the study intersections are tabulated in Appendix B.

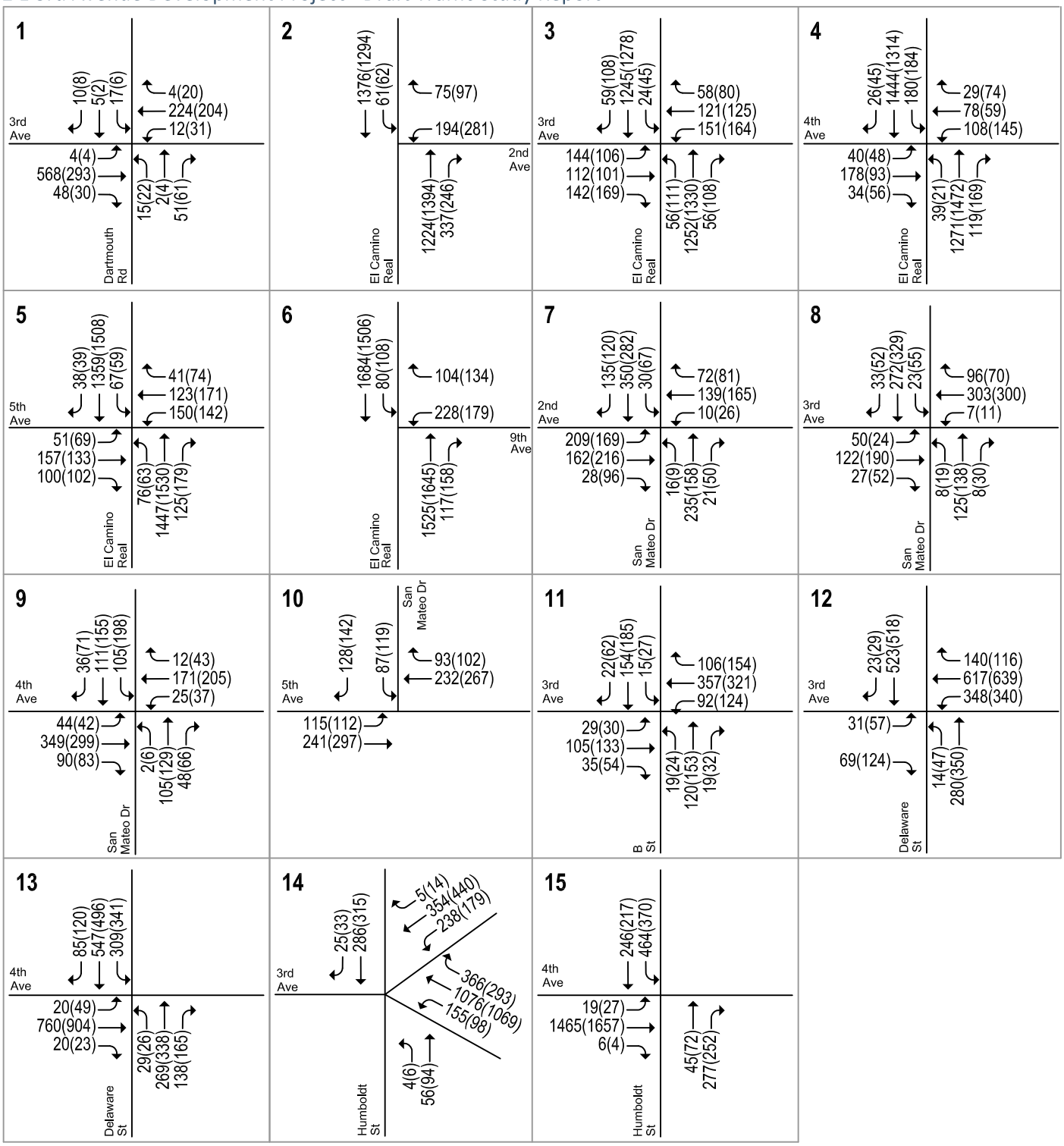
Table 6
Project Trip Generation Estimates

Land Use	Size	Units	Daily Rates	Daily Trips	AM Peak Hour Pike-Hr Rate	AM Splits In	AM Splits Out	AM In	AM Out	AM Total	PM Peak Hour Pike-Hr Rate	PM Splits In	PM Splits Out	PM In	PM Out	PM Total
Proposed Uses (2 E 3rd Avenue)																
Office[1]	20,025	safe.	11.0	221	1.56	88%	12%	27	4	31	1.49	17%	83%	5	25	30
- 15% Urban Infill/TOD Trip Reduction[3]				*-33*				*-4*	*-1*	*-5*				*-1*	*-4*	*-5*
Retail[2]	3,943	safe.	42.7	168	0.96	62%	38%	2	2	4	3.71	48%	52%	7	8	15
- 50% Downtown Retail Trip Reduction[4]				*-84*				*-1*	*-1*	*-2*				*-4*	*-4*	*-8*
221 S El Camino Real Development																
Office[1]	21,087	s.f.	11.0	233	1.56	88%	12%	29	4	33	1.49	17%	83%	5	26	31
- 15% Urban Infill/TOD Trip Reduction[3]				*-35*				*-4*	*-1*	*-5*				*-1*	*-4*	*-5*
Retail[2]	11,412	s.f.	42.7	487	0.96	62%	38%	7	4	11	3.71	48%	52%	20	22	42
- 50% Downtown Retail Trip Reduction[4]				*-244*				*-4*	*-2*	*-6*				*-10*	*-11*	*-21*
Total Net New Trips:				**713**				**52**	**9**	**61**				**21**	**58**	**79**

Notes:
All trip rates are based on Institute of Traffic Engineers (ITE), *Trip Generation Manual*, 9th Edition, 2012.
[1] Land Use Code 710 (General Office), average rates expressed in trips per 1,000 square feet (s.f.) gross leasable area.
[2] Land Use Code 820 (Shopping Center), average rates expressed in trips per 1,000 s.f. gross leasable area.
[3] A reduction was applied to office trips based on the trip surveys for urban Infill, mixed-use, and transit-oriented developments (TOD) published in Caltrans' *Trip-Generation Rates for Urban Infill Land Uses in California*, June 2009.
[4] A reduction was applied retail trips based on the observation of retail uses in San Mateo downtown area.

Intersection Traffic Volumes

The trip estimates for both projects were added to the background traffic volumes (described in Chapter 4) to derive the background plus two projects traffic volumes. Figure 11 shows the intersection turning-movement volumes under background plus two projects conditions.



LEGEND

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

Figure 11
Background Plus Two Projects
(2 E 3rd Ave & 221 S El Camino Real) Traffic Volumes

Intersection Levels of Service

The results of the intersection level of service analysis under background plus two projects conditions are summarized in Table 7. The intersection level of service calculation sheets are included in Appendix C. The results show that under background plus project conditions, all study intersections are expected to operate at LOS C or better during the AM and PM peak hours. At S El Camino Real/E 4th Avenue, S El Camino Real/ 9th Avenue, and S Delaware Street/E 3rd Avenue, the average delay was estimated to decrease slightly with the addition of project traffic during the AM peak hour. This is because the average delay values shown in the table are weighted averages. Weighted average delays can decrease when traffic is added to a movement with a low delay.

Table 7
Background Plus Two Projects Intersection Levels of Service

				Background		Background+Two Projects		
ID	Intersection	Control[1]	Peak Hour	Avg. Delay[2]	LOS	Avg. Delay[2]	LOS	Incr. In Avg. Delay
1	Dartmouth Rd and W 3rd Ave	Signal	AM	4.2	A	4.2	A	0.0
			PM	5.8	A	5.8	A	0.0
2	S El Camino Real and 2nd Ave	Signal	AM	9.4	A	9.5	A	0.1
			PM	15.1	B	15.4	B	0.3
3	S El Camino Real and E 3rd Ave	Signal	AM	16.2	B	16.2	B	0.0
			PM	19.2	B	19.2	B	0.0
4	S El Camino Real and E 4th Ave	Signal	AM	18.2	B	18.1	B	-0.1
			PM	20.7	C	20.8	C	0.1
5	S El Camino Real and E 5th Ave	Signal	AM	18.6	B	18.6	B	0.0
			PM	20.4	C	20.7	C	0.3
6	S El Camino Real and 9th Ave	Signal	AM	12.0	B	11.9	B	-0.1
			PM	9.7	A	9.7	A	0.0
7	S San Mateo Dr and 2nd Ave	Signal	AM	11.7	B	11.7	B	0.0
			PM	11.8	B	11.8	B	0.0
8	S San Mateo Dr and E 3rd Ave	Signal	AM	11.1	B	11.2	B	0.1
			PM	10.2	B	10.3	B	0.1
9	S San Mateo Dr and E 4th Ave	Signal	AM	10.6	B	10.6	B	0.0
			PM	14.1	B	14.3	B	0.2
10	S San Mateo Dr and E 5th Ave	Signal	AM	7.9	A	8.0	A	0.1
			PM	9.3	A	9.4	A	0.1
11	S B St and E 3rd Ave	Signal	AM	8.8	A	8.8	A	0.0
			PM	10.0	A	10.0	A	0.0
12	S Delaware St and E 3rd Ave	Signal	AM	19.4	B	19.3	B	-0.1
			PM	22.5	C	22.5	C	0.0
13	S Delaware St and E 4th Ave	Signal	AM	20.2	C	20.2	C	0.0
			PM	22.0	C	22.1	C	0.1
14	S Humboldt St and E 3rd Ave	Signal	AM	27.4	C	27.5	C	0.1
			PM	24.0	C	24.0	C	0.0
15	S Humboldt St and E 4th Ave	Signal	AM	20.3	C	20.3	C	0.0
			PM	19.1	B	19.1	B	0.0

Notes:
[1] Intersection control under existing conditions.
- Signal = signalized Intersection

[2] Overall weighted average control delay (seconds per vehicle) is reported for signalized intersections.

6. Cumulative Conditions

Cumulative 2030 traffic conditions for the AM and PM peak hours are taken from the 2030 General Plan. Hexagon has determined that the proposed project is included in the 2030 travel demand forecast model for the General Plan.

Intersection Traffic Volumes

The year 2030 AM and PM peak hour traffic volumes at the study intersections were obtained from the 2030 forecasts for the General Plan. In the 2030 General Plan, traffic volumes were not projected for the study intersections at Dartmouth Road/W 3rd Avenue, S El Camino Real/E 5th Avenue, and S El Camino Real/9th Avenue; and were projected lower than existing volumes for intersections at S El Camino Real/2nd Avenue and S San Mateo Drive/2nd Avenue. Thus, year 2030 forecasts at these five intersections were interpolated based on traffic volume growth patterns at adjacent intersections. Cumulative condition traffic volumes are shown on Figure 13.

Intersection Levels of Service

The intersection levels of service under 2030 Cumulative Conditions are summarized in Table 8. The level-of-service calculation sheets are included in Appendix C. The results show that all of the signalized study intersections would operate at mid-LOS D or better under 2030 conditions. Since the proposed project is included in the existing 2030 forecasts, and all intersections are forecasted to operate at acceptable levels of service, the proposed project would have an insignificant impact on intersection levels of service.

Table 8
Intersection Levels of Service Under Cumulative Conditions

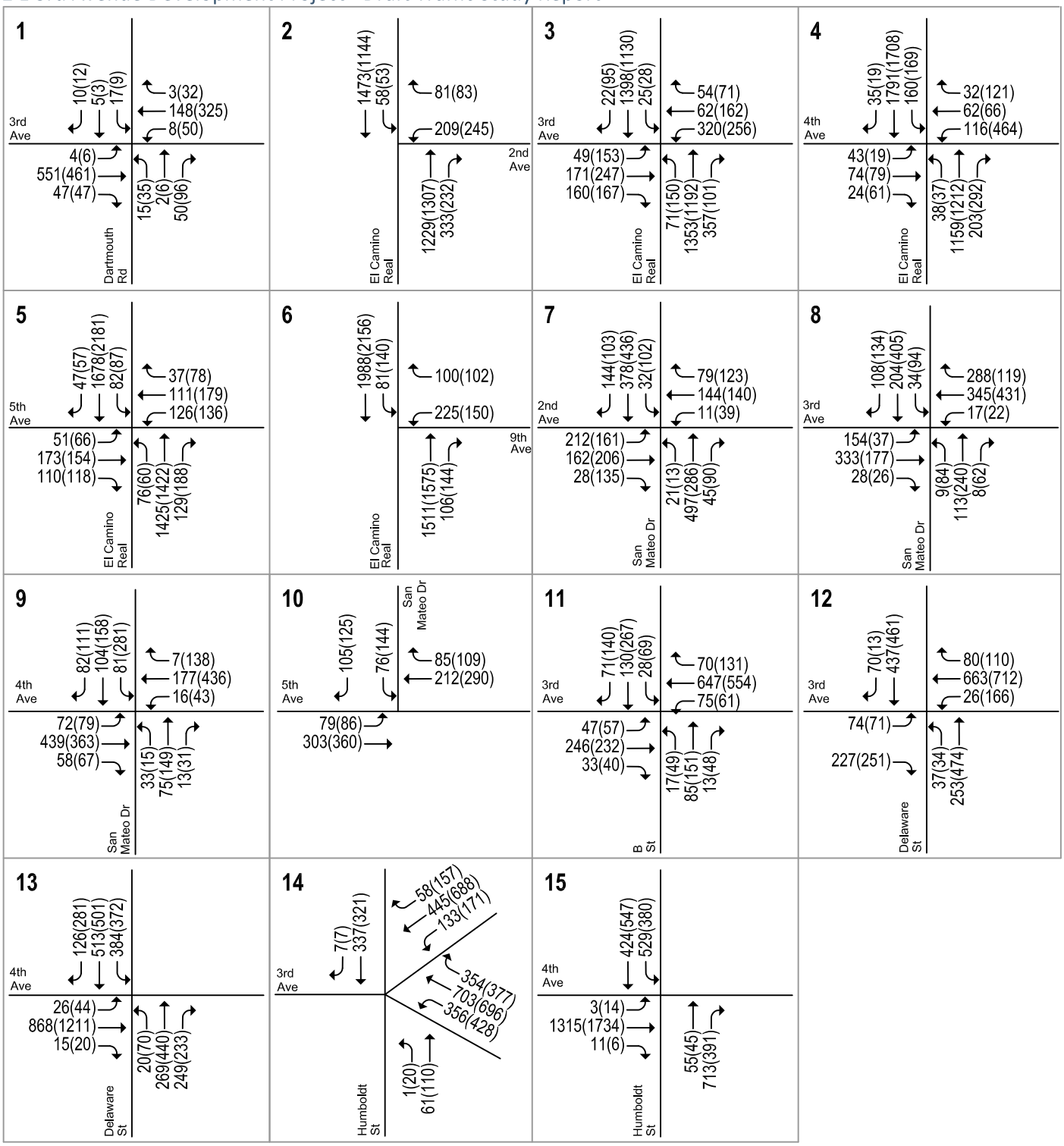
ID	Intersection	Existing Control[1]	Peak Hour	Existing Avg. Delay[2]	Existing LOS	Cumulative[3] Avg. Delay[2]	Cumulative[3] LOS
1	Dartmouth Rd and W 3rd Ave	Signal	AM	4.2	A	4.3	A
			PM	5.8	A	6.2	A
2	S El Camino Real and 2nd Ave	Signal	AM	9.4	A	9.8	A
			PM	15.1	B	13.9	B
3	S El Camino Real and E 3rd Ave	Signal	AM	15.9	B	27.0	C
			PM	17.7	B	27.3	C
4	S El Camino Real and E 4th Ave	Signal	AM	16.4	B	16.0	B
			PM	20.1	C	37.0	D
5	S El Camino Real and E 5th Ave	Signal	AM	18.3	B	18.3	B
			PM	20.2	C	21.6	C
6	S El Camino Real and 9th Ave	Signal	AM	11.7	B	12.0	B
			PM	8.6	A	9.0	A
7	S San Mateo Dr and 2nd Ave	Signal	AM	11.7	B	11.8	B
			PM	11.8	B	12.7	B
8	S San Mateo Dr and E 3rd Ave	Signal	AM	11	B	16.1	B
			PM	10.2	B	20.7	C
9	S San Mateo Dr and E 4th Ave	Signal	AM	10.9	B	12.5	B
			PM	14.1	B	20.9	C
10	S San Mateo Dr and E 5th Ave	Signal	AM	7.8	A	9.7	A
			PM	9.1	A	11.4	B
11	S B St and E 3rd Ave	Signal	AM	8.8	A	11.5	B
			PM	10	A	17.4	B
12	S Delaware St and E 3rd Ave	Signal	AM	19.4	B	31.0	C
			PM	22.5	C	31.6	C
13	S Delaware St and E 4th Ave	Signal	AM	20.1	C	23.0	C
			PM	21.6	C	39.9	D
14	S Humboldt St and E 3rd Ave	Signal	AM	27.3	C	23.8	C
			PM	23.8	C	28.1	C
15	S Humboldt St and E 4th Ave	Signal	AM	20.3	C	30.8	C
			PM	19.1	B	28.6	C

Notes:

[1] Intersection control under existing conditions.
- Signal = signalized Intersection

[2] Overall weighted average control delay (seconds per vehicle) is reported for signalized intersections.

[3] LOS and delay at study intersections, except #1, #2, #5, #6, and #7, is based on 2030 level of service analysis conducted for City of San Mateo General Plan. LOS and delay at intersections #1, #2, #5, #6, and #7 were updated for the study using volumes interpolated from the 2030 volumes at adjacent study intersections.



LEGEND

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

Figure 12
Cumulative Traffic Volumes

7.
Other Transportation Issues

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

- Vehicle miles traveled (VMT)
- Site Access
- Potential impacts on bicycle, pedestrian, and transit facilities

Unlike the level of service impact methodology, which is established by each jurisdiction, the analyses in this chapter are based on professional judgment in accordance with the standards and methods employed by the traffic engineering community.

Vehicle Miles Traveled

SB 743, signed in September 2013, proposed several changes to the California Environmental Quality Act (CEQA) for projects located in areas served by transit (i.e., transit-oriented development or TOD). Those changes directed the Governor's Office of Planning and Research (OPR) to develop new metrics (i.e. an alternative to level of service) for analyzing transportation impacts under CEQA. Alternative metrics for transportation impacts may include vehicle miles traveled (VMT), VMT per capita, automobile trip generation rates, or automobile trips generated. The OPR released a preliminary discussion draft of updating transportation impact analysis in the CEQA Guidelines in August 2014, and is still in the process of making revisions to the guidelines.

Because the alternative approach to level of service analysis has not yet been finalized and adopted by the OPR, no standard or approach has been developed by local agencies for SB 743. However, because VMT is one of the alternative metrics considered, this report presents some VMT data available from the Metropolitan Transportation Commission (MTC) travel demand forecast model (http://analytics.mtc.ca.gov/foswiki/Main/VmtPerWorker), for informational purposes only. It is not intended to provide any indication of the transportation impacts of the project under SB 743.

Daily VMT for projects in downtown San Mateo versus the Bay area average are presented based on the VMT modeled by the MTC model. The forecasted daily VMT is 26.4 miles per worker employed in downtown San Mateo, while the Bay Area average daily VMT is 23.8 miles per worker.

Site Access

The project would not include any on-site parking spaces. Access to the project site would be provided via sidewalks along the project's frontage on E 3rd Avenue and S El Camino Real.

Pedestrian Access

Pedestrian access is provided by the existing sidewalks and crosswalks throughout the downtown area. Within the vicinity of the project site, all roadways currently have pedestrian sidewalks on both sides of the road. All intersections currently have crosswalks on all approaches with pedestrian walk signals.

Bicycle Access

Bicycle facilities within the vicinity of the project site are shown on Figure 3 and discussed in Chapter 2. These existing bicycle facilities are not well-connected and do not provide immediate access to the project site. For immediate access to the project site on S El Camino Real and E 3 Avenue, bicycle riders would share the road with vehicles. The City's *Bicycle Master Plan* identifies some additions to the bike network within the downtown area. Future bicycle lanes are proposed for 5th Avenue between Maple Street and S San Mateo Drive and Future signed bicycle routes are proposed for E 5th Avenue, S San Mateo Drive, and S B Street in the downtown area.

The project will provide 6 long-term bicycle parking spaces in a bicycle storage room, located near the project's main entrance on S El Camino Real and 4 short-term bicycle parking spaces on sidewalks along S El Camino Real and E 3rd Avenue (see Figure 2 for proposed site plan). According to the City of San Mateo Off-Street Parking Requirements (Section 27.64.262), the project is required to provide 3 long-term and 3 short-term bicycle parking spaces.

Potential Impacts on Bicycle, Pedestrian, and Transit Facilities

The project is located in downtown San Mateo with sidewalks and crosswalks provided at all intersections. Many bus stops are nearby, and the project is about a half mile from the San Mateo Caltrain Station. Existing transit services and pedestrian facilities around the project are good. Although the bicycle facilities are not well-connected, local roads such as S San Mateo Drive, S B Street, 2nd Avenue, and E 5th Avenue carry low traffic volumes and are conducive to bicyclists. The project would not result in changes to the existing bicycle, pedestrian, and transit facilities. Therefore, there would be no impacts to these facilities.

8. Transportation Demand Management Program

This chapter describes transportation demand management (TDM) programs that are applicable to the proposed office development for the project.

The project is located in the downtown San Mateo and close to the San Mateo Caltrain Station. The project location by itself provides the following advantages in promoting transit, bicycling, and walking and reducing single occupancy vehicle trips generated by the project.

- **Downtown Location.** The location of a project within or adjacent to a central business district promotes pedestrian and bicycle travel in a relatively high density area of complementary land uses. The project is located on the edge of the downtown district, and it is a very short walk or bicycle ride from the retail, office, and residential land uses on El Camino Real, San Mateo Drive, E 3rd Avenue, E 4th Avenue, and other streets in the downtown and the surrounding area. The project location effectively renders it part of a large-scale mixed-use development in a pedestrian-friendly environment with a significant share of internal trips.
- **Proximity to Transit.** The project is located at about a half mile, or about a 20-minute walk, from the San Mateo Caltrain Station and within 1,000 feet of major bus stops in the downtown. Caltrain and SamTrans routes provide frequent and reliable transit service to a high percentage of regional destinations.

The following TDM programs are recommended for the project to further encourage future tenants and employees taking alternative transportation modes (transit, bicycle, and carpool) to work.

TDM Programs

Downtown Transportation Management Association

As part of the Downtown Area Plan polices, a downtown Transportation Management Association (TMA) is necessary to provide support and oversight of the downtown residential and commercial transportation opportunities and enhance the use of public transit and/or bicycles while reducing the use of single-occupant vehicles (SOV). The formation of a downtown TMA would enable the establishment of large scale TDM programs that require a broader participation base than one project can provide. Development projects in the downtown area are required to contribute seed money toward the formation of a downtown TMA. TDM programs established by the TMA would benefit multiple businesses, property owners, and downtown customers by facilitating use of alternative transportation and otherwise reduce SOV trips.

The property owner will participate in and contribute seed money toward the formation of a downtown TMA.

Employee Transportation Coordinator

The property owner will work with future tenants to designate an employee transportation coordinator (ETC) who will be responsible for implementing and managing the TDM programs. This ETC is responsible for ensuring that future tenants and employees are aware of transportation options and how to utilize TDM programs, employees have a point of contact for any questions that may arise, programs run smoothly, and programs and services are coordinated with the downtown TMA and its members. The ETC will provide the following services and functions:

- Provide information and resource materials on the full range of transportation choices available to employees
- Provide transportation information packets to new employees
- Post materials on commute alternatives on the informational kiosk and provide up- to- date transit maps and schedules

Alternative Transportation Information and TDM Marketing

The property owner will work with future tenants to provide information on non-auto transportation alternatives and TDM programs through the ETC. New employers/employees will be provided transportation information packets. This packet will include information about transit maps/schedules (Caltrain and SamTrans), locations of bus stops, bike maps, guaranteed ride home service, ride matching services, transit planning resources, and bicycle parking on-site. Also included in the packet will be information regarding how to contact the ETC assigned to the development. Additional, one transportation kiosk will be provided on-site in the lobby of the project. The kiosk may include information on non-auto transportation alternatives.

Telecommute/Flexible Work Schedule Program

Offering employees the opportunity to work from home or travel outside the peak travel periods can help reduce the number of commute trips to and from the project site. The project will include the following infrastructure to support its future tenants to implement an alternative work schedule:

- Heating, cooling, and ventilation systems will be available for extended schedules.
- High-bandwidth internet connections will be included to facilitate telecommuting
- Security services will be provided to support extended schedules.

Guaranteed Ride Home Program

Guaranteed Ride Home (GRH) is a program that provides a “back-up” ride to employees who use transit, carpool, biking/walking, or other alternative as their commute mode. It is an important supportive measure to encourage employees to not drive alone to work.

If an area-wide GRH program is not provided by the downtown TMA at the time of project occupancy, the property owner will work with future tenants to provide the GRH service to future employees. The program will be managed by the ETC. The GRH program is typically implemented through contracting with a ride service, such as a taxi company.

Transit Programs

Trip Planning Resources

Online transit trip planning services are available to the greater San Francisco Bay Area through 511.org. Users enter their starting and ending points, and either the desired starting or ending trip time. The service can build an itinerary that best suits the user’s preferences for the fastest trip, fewest transfers, or least walking. Many popular features from 511.org can be accessed using smart phones or mobile devices. With 511 Mobile, commuters can: (1) receive real-time transit departure predictions, (2) plan a public transit trip, (3) check real-time traffic conditions on the live traffic map, and (4) get current driving times for the most popular routes in the Bay Area.

Dadnab.com enables Bay Area commuters to get transit directions by text message. Users send a text message with their origin, destination, and optional departure or arrival time and Dadnab replies with a detailed itinerary listing which buses or trains to take, stop locations, and departure times.

Pre-tax Commuter Benefits

Pre-tax commuter benefit programs allow employees to pay for transit passes with pre-tax earnings and can help encourage transit use among employees. These benefits are offered at the federal tax level and are available to employers of any size. One example is the Commuter Checks program.

Subsidized or Free Transit Passes

Employers may wish to provide free or subsidized transit passes for employees. There are a number of ways to structure a financial incentive for transit. Employers can cover a portion or the total monthly cost of transit for those employees who take transit through a pre-tax benefit, or purchase transit passes themselves and distribute them to employees, or offer a universal transit pass program.

Bicyle Programs

On-Site Bicycle Storage and Shower/Changing Facilities

The City municipal code (section 27.64.262 Bicycle Parking Facilities) requires 1 short-term parking space per 20,000 s.f. and 1 long-term parking space per 10,000 s.f. for general office developments in the downtown and 1 short-term parking space per 2,000 s.f. and 1 long-term parking space per 12,000 s.f. for downtown retail stores. Short-term bicycle parking must be along project frontage and within 50 feet of the main entrance to the building or commercial use.

The project will provide 6 long-term bicycle parking spaces in a bicycle storage room, located near the project's main entrance on S El Camino Real and 4 short-term bicycle parking spaces on sidewalks along S El Camino Real and E 3Rd Avenue (see Figure 2 for proposed site plan). This meets the requirements of the City municipal code.

Additional, although not required by the City municipal code, the project will provide adequate shower and changing facilities for bicyclists.

Biking Financial Incentives

Employers may wish to provide their employees with financial incentives to utilize biking when commuting to and from the project site. Offering financial incentives can have a measurable impact on encouraging employees to try modes other than driving alone to work. Daily, weekly, or monthly financial incentives could be offered to those employees who use a bike as their primary mode of travel to work.

One example of a biking financial incentive is the Federal Bike Commuter Benefit which lets bike commuters receive up to $20 per month as a tax-free employer subsidy for riding to work. This benefit cannot be used in combination with the pre-tax transit benefit in the same month. Additional financial incentives beyond what can be taken tax-free may be appropriate to further encourage biking as a commute mode.

Carpool and Vanpool Programs

Rideshare Matching Services

Existing programs such as 511.org can be utilized to facilitate carpooling. The 511 Carpool Calculator is a 511-sponsored online calculator that determines the cost of commuting by driving alone as well as the potential savings by adding carpool partners. The 511 RideMatch service provides an interactive, on-demand system that helps commuters find carpools, vanpools or bicycle partners. This free carpool and vanpool ridematching service helps commuters find others with similar routes and travel patterns with whom they may share a ride. Ride matching assistance is also available through a number of peer-to-peer matching programs, such as Zimride, which utilize social networks to match commuters.

There are also many free and commercial applications offering carpooling or discounted taxi services. These applications are created by third-party app developers for smart phone users. Carpooling applications include Carma and SliceRides. Discounted taxi services include Uber, Lyft, and Sidecar Ride.

Subsidized or Free Vanpools or Carpools

To further encourage carpooling and vanpooling, employers can offer financial incentives to those persons who carpool or vanpool. If employers are interested in establishing a vanpool there are several existing services that can assist employers. 511.org can provide assistance in setting this program up and finding a vendor. One example of an existing vendor in the Bay Area is Enterprise, which offers vanpooling services for both individuals and employers.

2 E 3rd Avenue Development Project TIA
Technical Appendices

Appendix A

Traffic Count Data

Appendix B

Volume Spreadsheets

Appendix C

Level of Service Calculation Sheets

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