3.2 Traffic and Transportation

Environmental Setting

PHYSICAL SETTING

This subsection addresses the existing conditions for transportation, including the regional overview, local setting, freeway segments, local roadway intersections, transit, bicycle facilities, and pedestrians.

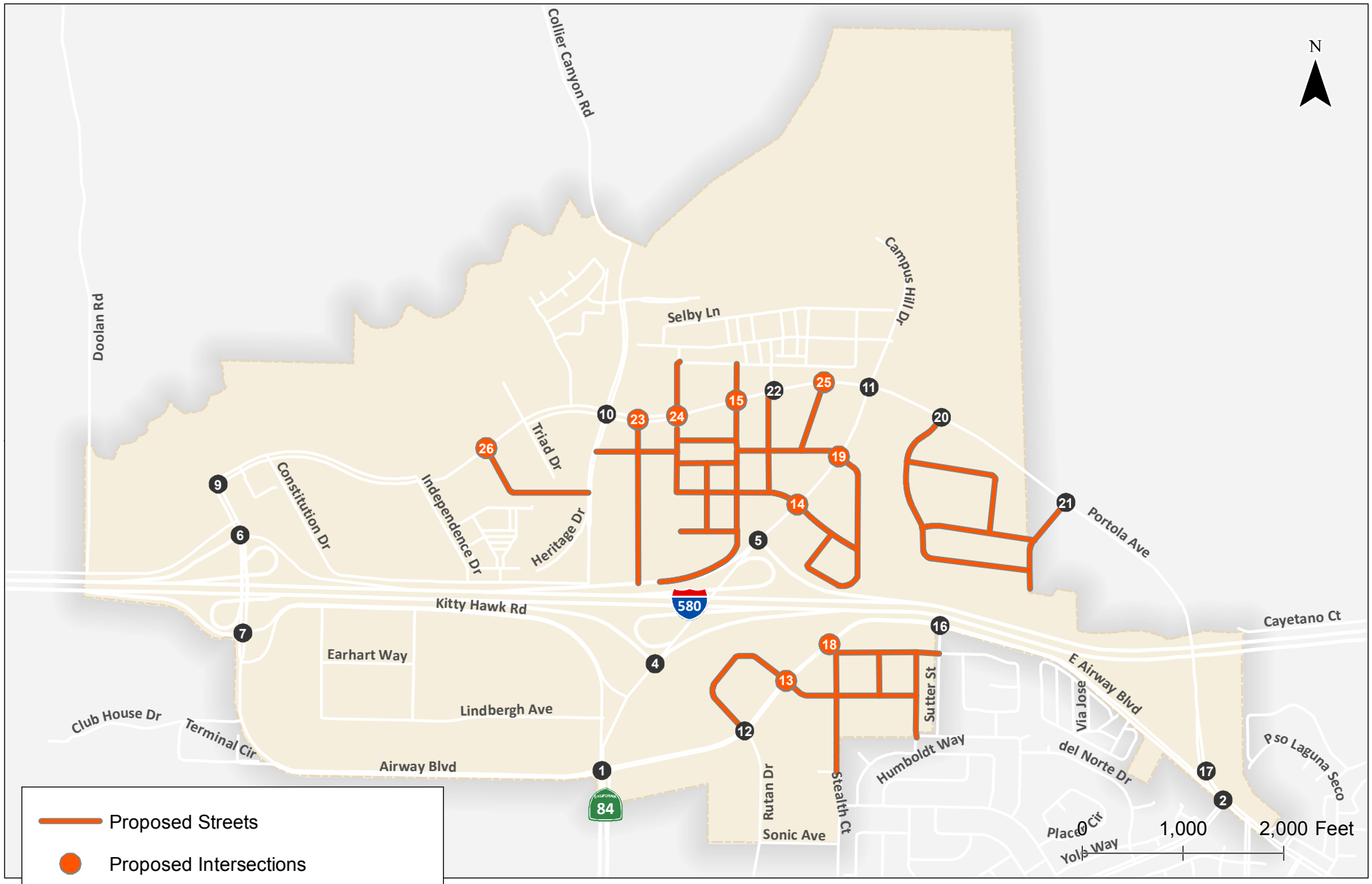
Regional Overview

The Tri-Valley Area is located east of San Francisco Bay within the I-580 and I-680 freeway corridors, and includes the Amador, Livermore, and San Ramon Valleys. The Tri-Valley Area encompasses the cities of Dublin, Pleasanton, and Livermore in eastern Alameda County and the town of Danville and the City of San Ramon in south Contra Costa County.

Regional trends in the Tri-Valley Area that affect transportation within the project vicinity are described below. The region has been one of the fastest-growing subregions of the San Francisco Bay Area (Bay Area). The Tri-Valley Area's housing market has largely driven its transportation patterns, although the Tri-Valley Area also includes multiple employment areas. The strongest travel pattern is in-commuting from the Tri-Valley Area and points east (including San Joaquin and Stanislaus Counties) to the rest of the Bay Area. Demand following this pattern has increased, leading to regular heavy traffic congestion on I-580.

Local Setting

This subsection describes the existing conditions related to freeway segments, local roadway intersections, transit, bicycles, and pedestrians. Figure 3.2-1 illustrates the study area, which comprises a portion of the City of Livermore, as well as portions of unincorporated Alameda County. The facilities included in the analysis vary according to transportation sub-topic, as noted in the subsections that follow.



Study Area and Study Intersections
Livermore, CA

Figure
3.2-1

Coordinate System: NAD 1983 StatePlane California III FIPS 0403 Feet

KITTELSON & ASSOCIATES

Freeway Segments

The key regional freeway route through the study area is I-580. Figure 3.2-2 presents the freeway segments analyzed as part of this study. Project impacts on the study area roadways were identified by measuring the effect of project traffic on freeways in the site vicinity during the morning (6:30 to 8:30 a.m.) and evening (4:30 to 6:30 p.m.) peak periods, when traffic volumes are the greatest and the project is expected to generate the most vehicular traffic. These segments were selected based on their location along I-580 and major travel routes serving the potential project station locations and in consultation with local jurisdictions.

I-580 is a freeway that runs east-west from I-5 near Tracy to United States (U.S.) Highway 101 in San Rafael. I-580 connects the Bay Area with San Joaquin County and is a major inter-regional route for commuting, truck commerce, and recreational travel. Through the study area, I-580 currently features at least four general purpose lanes in each direction, as well as one auxiliary lane in each direction between most interchanges. I-580 also includes one high-occupancy toll (HOT) lane in the westbound direction between Greenville Road and San Ramon Road/Foothill Road and two HOT lanes in the eastbound direction, with one of the eastbound HOT lanes extending from Hacienda Drive to Greenville Road and the other extending from El Charro/Fallon Road to Vasco Road. All together, these HOT lanes are known as the I-580 Express Lanes.

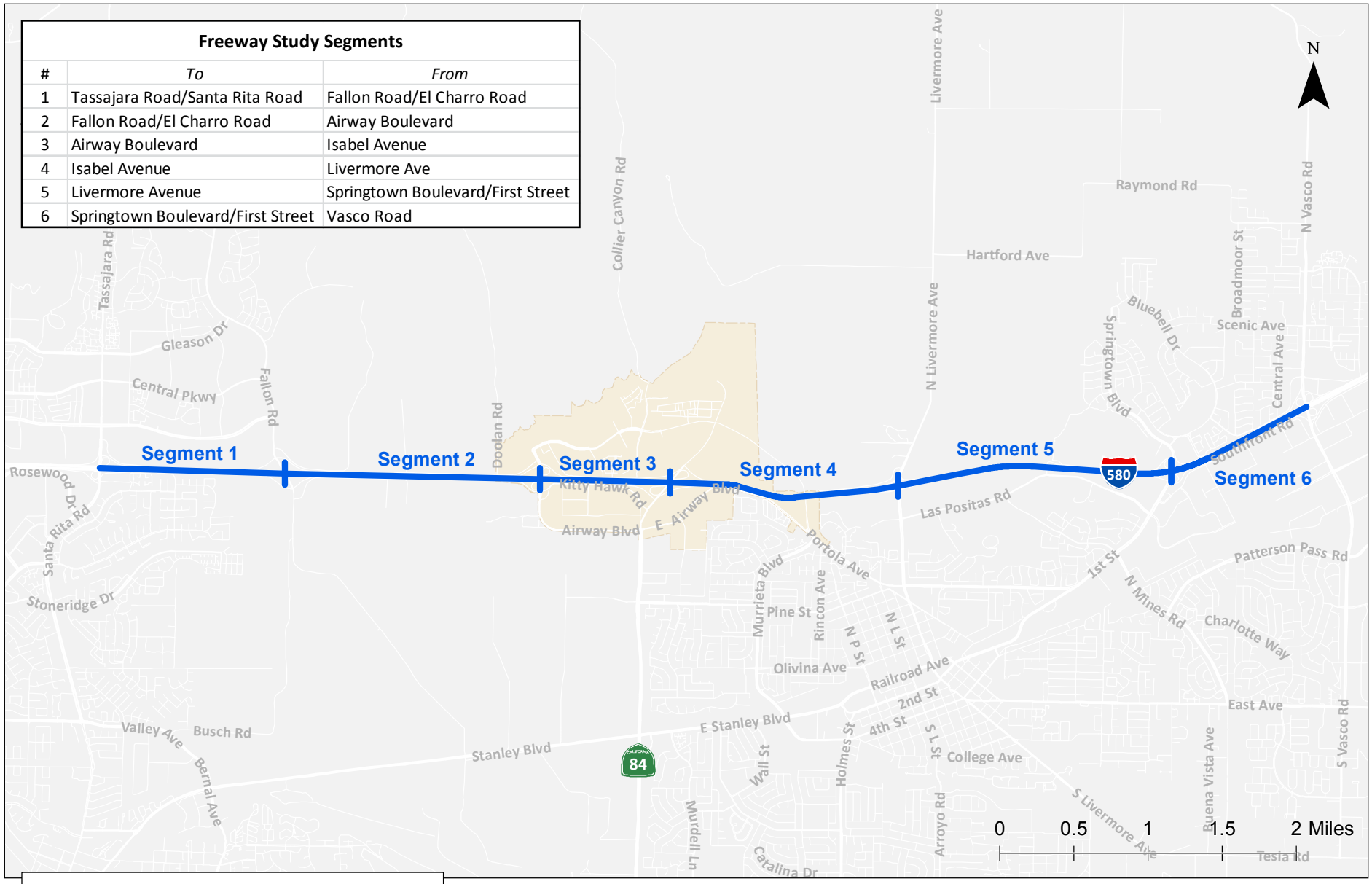
I-580 experiences severe congestion during the morning (AM) peak period and evening (PM) peak period. The peak hour varies for each study segment; however, the AM peak hour typically occurs between 6:30 and 8:30 a.m. while the PM peak hour typically occurs between 4:30 and 6:30 p.m. Within the Livermore city limits in 2015, I-580 carried an average daily traffic volume of 149,000 to 214,000 vehicles in both directions (Caltrans 2015).

The stretch of I-580 through Altamont Pass just east of Livermore is a primary transportation gateway to the Bay Area from the Central Valley (including San Joaquin and Stanislaus Counties). On an average weekday in 2015, 149,000 vehicles passed over Altamont Pass on I-580 (counting trips in either direction) (Caltrans, 2015).

The operational performance of freeway segments is described by level of service (LOS), a performance metric for roadways and intersections based on the ratio of vehicle demand to available capacity. Levels range from LOS A, which indicates free-flowing or excellent conditions with short delays, to LOS F, which indicates congested or overloaded conditions with extremely long delays. For more information about the freeway segment LOS methodology, please see the Methodology and Assumptions subsection below. Existing freeway operations were evaluated using information from the Alameda County Congestion Management Program 2014 LOS Monitoring Study (Alameda CTC, 2014) developed by the Alameda County Transportation Commission (Alameda CTC).

Freeway Study Segments

#	*To*	*From*
1	Tassajara Road/Santa Rita Road	Fallon Road/El Charro Road
2	Fallon Road/El Charro Road	Airway Boulevard
3	Airway Boulevard	Isabel Avenue
4	Isabel Avenue	Livermore Ave
5	Livermore Avenue	Springtown Boulevard/First Street
6	Springtown Boulevard/First Street	Vasco Road



Study Segments

Proposed Project Development Area

Freeway Study Segments
Livermore, CA

Figure
3.2-2

Coordinate System: NAD 1983 StatePlane California III FIPS 0403 Feet

KITTELSON & ASSOCIATES

Local Roadways and Intersections

The local roadway network for the study area includes arterials, collectors, and local streets. This network is described below from north to south and east to west, as designated in general plan documents for the relevant jurisdictions. The roadway intersections included in this analysis are based on consultation with local jurisdictions, and the intersection location along major travel routes that may be affected by the proposed Plan. Figure 3.2-1 identifies the intersections analyzed as part of this study.

Operating conditions on the study area roadways were determined by measuring the effect of traffic at intersections in the site vicinity during the AM and PM peak hours, when traffic is typically the highest. Traffic conditions at study intersections, listed in Table 3.2-1, were evaluated using the Highway Capacity Manual (HCM) 2000 (Transportation Research Board, 2000) LOS methodology, as described in the Methodology and Assumptions subsection below.

Existing intersection volumes were obtained from counts conducted by BART and the INP team between 2016-2017. Multimodal volume counts were collected for AM and PM peak hours and are presented in Figure 3.2-3. Level of service analysis was computed for the study intersections, as shown in Table 3.2-1.

Under existing conditions, no study intersections exceed the adopted significance thresholds. Therefore, there are no impacted locations under existing conditions.

Table 3.2-1: Intersection Level of Service, Existing Conditions

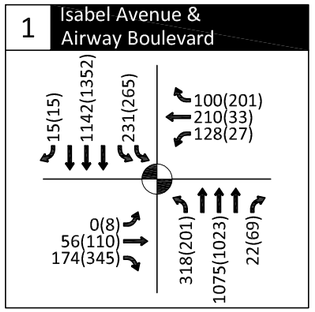
#	Name	Control	Standard	Existing AM			Existing PM		
				V/C	Delay	LOS	V/C	Delay	LOS
1	Isabel Avenue & Airway Boulevard	Signal	Exempt*	0.68	27.7	C	0.84	34.0	C
2	Murrieta Boulevard & Portola Avenue	Signal	Mid D	0.57	23.7	C	0.72	21.9	C
3	Livermore Avenue & Portola Avenue	Signal	Mid D	0.68	39.0	D	0.81	41.7	D
4	I-580 WB Ramps & Isabel Avenue	Signal	E	0.47	7.8	A	0.50	9.9	A
5	I-580 EB Ramps & Isabel Avenue	Signal	E	0.50	6.3	A	0.54	6.8	A
6	I-580 WB Ramps & Airway Boulevard	Signal	E	0.35	3.1	A	0.32	5.5	A
7	I-580 EB Ramps & Airway Boulevard	Signal	E	0.55	35.4	D	0.53	24.2	C
8	Isabel Avenue & Jack London Boulevard	Signal	Exempt*	0.94	48.6	D	0.89	45.1	D
9	Airway Boulevard & North Canyons Parkway	Signal	E	0.31	7.0	A	0.61	13.3	B
10	Collier Canyon Road & North Canyons Parkway	Signal	Mid D	0.44	23.3	C	0.48	23.9	C
11	Isabel Avenue & Portola Avenue	Signal	E	0.56	25.5	C	0.53	24.6	C

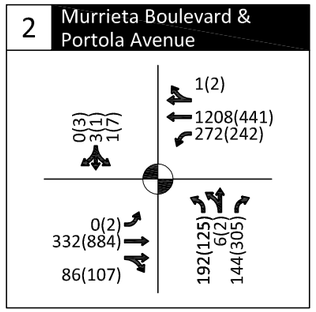
Table 3.2-1: Intersection Level of Service, Existing Conditions

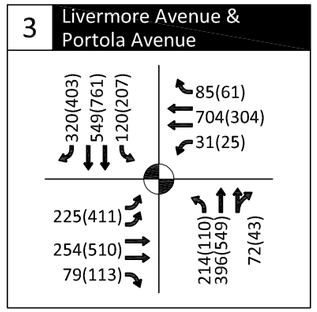
#	Name	Control	Standard	Existing AM			Existing PM		
				V/C	Delay	LOS	V/C	Delay	LOS
12	Rutan Drive & E. Airway Boulevard	Stop	Mid D	0.22	2.7 (15.4)	A (C)	0.15	1.6 (16.6)	A (C)
13	BART Access & E. Airway Boulevard	Future	Mid D	N/A	N/A	N/A	N/A	N/A	N/A
14	Isabel Avenue & BART Parking (North)	Future	Mid D	N/A	N/A	N/A	N/A	N/A	N/A
15	Portola Avenue & Main Street	Future	Mid D	N/A	N/A	N/A	N/A	N/A	N/A
16	Sutter Street & E. Airway Boulevard	Stop	Mid D	0.18	2.2 (11.9)	A (B)	0.26	1.5 (12.0)	A (B)
17	Portola Avenue & E. Airway Boulevard	Stop	Mid D	0.36	2.3 (12.7)	A (B)	0.70	6.2 (23.2)	A (C)
18	Stealth Street & E. Airway Boulevard	Future	Mid D	N/A	N/A	N/A	N/A	N/A	N/A
19	Isabel Avenue & INP Road	Future	Mid D	N/A	N/A	N/A	N/A	N/A	N/A
20	Portola Avenue & Tranquility Circle	Signal	Mid D	0.46	38.1	D	0.61	46.7	D
21	Portola Avenue & Sandalwood Drive	Stop	Mid D	0.47	0.1 (9.1)	A (A)	0.22	0.1 (10.2)	A (B)
22	Portola Avenue & Montage Drive/Road 3	Future	Mid D	N/A	N/A	N/A	N/A	N/A	N/A
23	Portola Avenue & Road 1	Future	Mid D	N/A	N/A	N/A	N/A	N/A	N/A
24	Portola Avenue & Road 2	Future	Mid D	N/A	N/A	N/A	N/A	N/A	N/A
25	Portola Avenue & Road 4	Future	Mid D	N/A	N/A	N/A	N/A	N/A	N/A
26	Gateway Drive & North Canyons Parkway	Future	Mid D	N/A	N/A	N/A	N/A	N/A	N/A

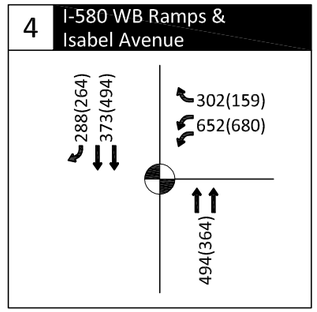
Note: * Exempt per Livermore Policy: Goal CIR-5, Objective CIR-5.1 Policy P4, Circulation Element, Amended 2014

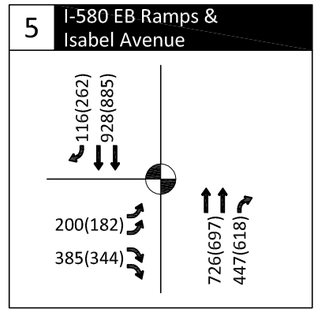
Source: Kittelson & Associates, Inc., 2018.

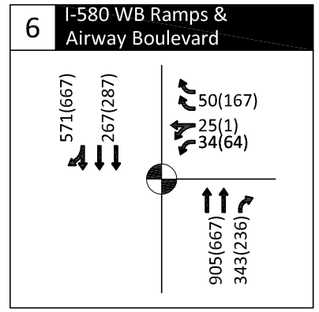


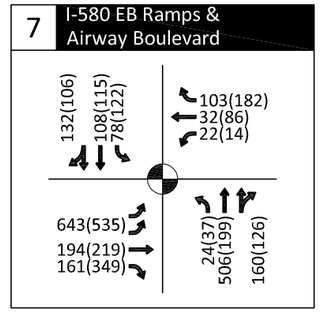


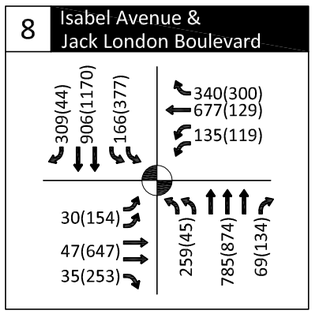


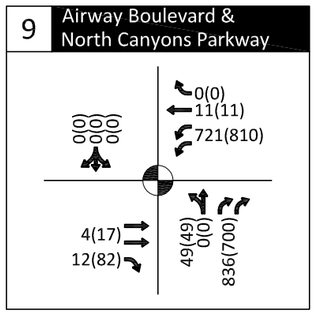


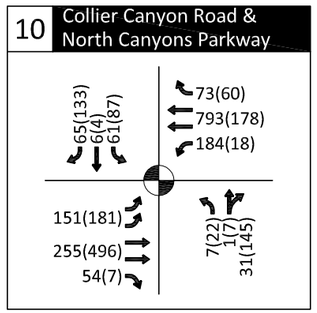


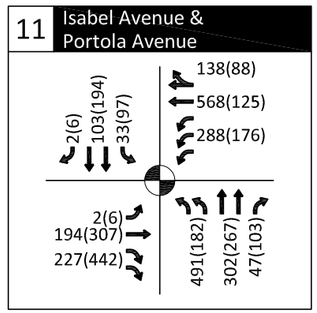


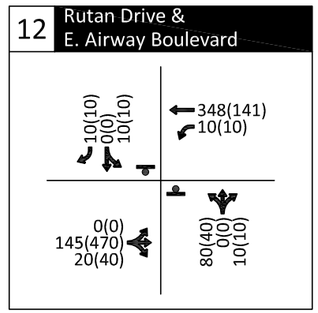


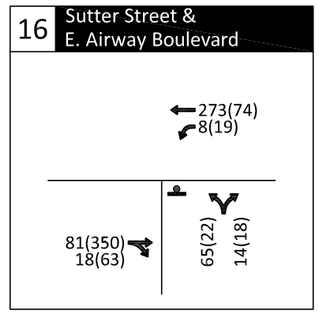


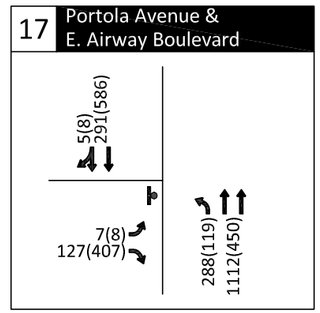


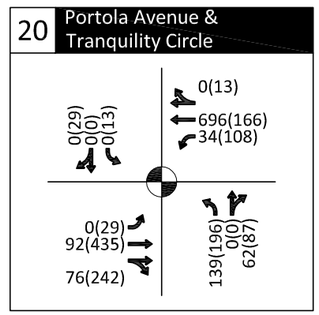


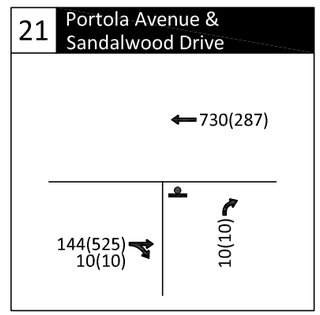












AM(PM) - Traffic Volume

- Stop Sign

- Traffic Signal

Existing Traffic Volumes
Weekday AM and PM Peak Hours
Livermore, CA

Figure
3.2-3

City of Livermore

In Livermore, the major streets include Collier Canyon Road, Isabel Avenue, Vallecitos Road/Holmes Street, Murrieta Boulevard, P Street, Livermore Avenue, Mines Road, Springtown Boulevard, Vasco Road, and Greenville Road, which provide north-south access through the city. In addition, North Canyons Parkway, Northfront Road, Jack London Boulevard, East Stanley Boulevard, Las Positas Road, Patterson Pass Road, First Street, Railroad Avenue, East Avenue, Altamont Pass Road, Portola Avenue, Fourth Street, Tesla Road, and Concannon Boulevard are major streets providing east-west access. All other facilities are classified as collector streets, intercounty routes, special rural routes, or local streets. Ten major arterials in Livermore were analyzed for this project EIR; these roadways, for which more than one intersection along the length of the arterial was studied, are described below.

- **Collier Canyon Road** is a north-south arterial in northern Livermore. North of the city limits, this arterial becomes primarily a two-lane undivided rural roadway, providing access between the City of Livermore and portions of unincorporated Alameda and Contra Costa counties and the Town of Danville to the north. The speed limit is 35 miles per hour (mph) along the roadway segment within the City of Livermore. Outside of the city limits, the roadway is posted at 45 miles per hour (mph) and carries low volume traffic.
- **North Canyons Parkway** is an east-west arterial north of I-580. This arterial is primarily a four-lane divided roadway with left-turn pockets where applicable. The speed limit is 45 mph. The street terminates at Doolan Road to the west and connects to Portola Avenue to the east. The cities of Dublin and Livermore are studying a future connection of this roadway with Dublin Boulevard to the west.
- **Isabel Avenue** is a north-south arterial, a portion of which is also designated as State Route 84. Isabel Avenue typically carries heavy commuter traffic along western Livermore. The arterial traverses the entire length of the City of Livermore, provides direct access to I-580, and connects several neighborhoods and commercial areas in western Livermore. Isabel Avenue provides two travel lanes in each direction near I-580, and reduces to one travel lane in each direction south of Jack London Boulevard, with left-turn pockets at key locations; however, at major intersection locations, the roadway is two lanes with a painted median. The State Route 84 Expressway Widening project, currently under construction and due for completion in 2018, will upgrade Isabel Avenue to expressway standards. Upon completion, Isabel Avenue will feature three lanes in each direction between Jack London Boulevard and Stanley Boulevard and two lanes in each direction between Stanley Boulevard and Ruby Hill Drive. The speed limit is primarily 50 mph along the entire roadway. Isabel Avenue would provide access to the proposed Isabel BART Station (Isabel Station) facilities north and south of I-580.
- **Jack London Boulevard** is an east-west arterial south of I-580 in western Livermore. This arterial is primarily a two-lane undivided road with left-turn pockets at most intersections. The speed limit is 45 mph. The street connects to Stoneridge Drive at the Livermore city limit and terminates at Murrieta Boulevard to the east.
- **Murrieta Boulevard** a north-south arterial that in western Livermore. The arterial includes two lanes in each direction, with a raised median and left-turn pockets at most intersections. The street connects to Portola Avenue in the north and Fourth Street in the south.

The roadway provides access to I-580 from western Livermore. The speed limit is 35 mph along the entire roadway.

- **Livermore Avenue** is a major north-south arterial that extends throughout the entire length of the City of Livermore and continues north providing access between the city and portions of unincorporated Alameda and Contra Costa counties and the Town of Danville. Traffic flow is moderate, and the roadway provides additional north-south linkages through downtown. The arterial is primarily a two-lane, divided roadway; however, near the downtown area, it is reduced to one lane in each direction, with left-turn pockets where applicable. The roadway provides access to I-580 and connects the freeway to several sub-areas throughout the City of Livermore. The speed limit along Livermore Avenue is 40 mph near I-580, and the speed limit is reduced to 30 mph near the downtown area. The posted speed limit is 25 mph in the downtown area between Railroad Avenue and Fourth Street.
- **Stanley Boulevard** is a four to five-lane road that extends from Santa Rita Road in Pleasanton to First Street in Livermore. The speed limit is 45 mph. The road features a Class II bicycle lane along its entire length and a Class I trail within the unincorporated Alameda County segment between the two cities.
- **Portola Avenue** is a major east-west arterial, located in northern Livermore that operates north of downtown. South of I-580, this arterial is primarily a four-lane divided roadway with left-turn pockets where applicable; north of I-580, this arterial varies from two lanes to six lanes. The roadway connects several neighborhoods and businesses and provides direct connection to other major arterials throughout northern Livermore. Portola Avenue previously terminated at ramps to/from I-580; in 2012, as the final component of the Isabel/I-580 Interchange project, Portola Avenue was extended over I-580 to connect with North Canyons Parkway, near Las Positas College, north of the Isabel Station site. The speed limit is 35 mph along the roadway.
- **Vasco Road** is a north-south arterial that typically carries truck traffic along eastern Livermore. The arterial operates along the entire length of the city and includes two travel lanes in each direction, with a raised median at most intersections. The roadway provides direct access to I-580 and connects several commercial, industrial, and agricultural areas in eastern Livermore. The arterial extends north to east Contra Costa County and is a primary commute route. The speed limit is 45 mph along the entire roadway.
- **Greenville Road** is a north-south arterial at the eastern edge of Livermore that typically carries truck traffic along the eastern part of the city. The arterial traverses the entire length of Livermore and includes two lanes in each direction, with a raised median and left-turn pockets at most intersections. The roadway provides direct access to I-580 and connects businesses, industrial uses, and agricultural areas in eastern Livermore. The speed limit is 45 mph along the entire roadway.

Livermore experience a significant amount of nonlocal cut-through traffic on local roads because large numbers of commuters use city streets to bypass the traffic congestion on I-580 and I-680. Cut-through traffic primarily occurs in response to freeway congestion and affects major east-west and north-south routes through the cities. Cut-through traffic can occur on arterial streets as well as on local and collector streets, and can also be accompanied by excessive speeding. Congestion on I-580 is predicted to worsen as cities east of the Altamont Pass continue to grow. City streets with noted cut-through traffic include Livermore Avenue, Concannon Boulevard, First Street,

Vasco Road, Greenville Road, Stanley Boulevard, Isabel Avenue, Northfront Road, Southfront Road, and Las Positas Road. Increases in regional commuting, combined with increases in congestion on regional freeways and highways such as I-580, are expected to cause an increase in the amount of cut-through traffic in all Tri-Valley cities as motorists seek non-freeway routes for regional trips.

Transit

BART

The BART system consists of six train lines operating out of 46 stations over 112 route miles; the system connects the Bay Area counties of Alameda, Contra Costa, San Francisco, and San Mateo. During fiscal year 2015–2016, 433,000 passengers entered the BART system each weekday. Four out of the six BART lines travel from the East Bay to San Francisco through a 3.6-mile-long tunnel known as the Transbay Tube. The Transbay Tube serves half of BART's daily ridership and is a major capacity constraint for the BART system. The Transbay Tube can safely accommodate about one train per 2.5 minutes, and is at capacity with 23 trains and nearly 25,000 passengers during the peak hour in the peak direction.

BART provides daily service in the study area at the Dublin/Pleasanton Station, which is located in the I-580 median between the Hopyard Road and Hacienda Drive interchanges. All trains serving the Dublin/Pleasanton Station currently run on the Dublin/Pleasanton-Daly City line, directly to Daly City via downtown San Francisco. On weekdays, BART trains complete 76 trips along this route in each direction, offering service from 4:00 a.m. to 1:00 a.m. the following morning. Weekday trains operate at 15-minute headways until about 7:30 p.m., and at 20-minute headways after 7:30 p.m. In fiscal year 2015–2016, an average of 7,900 BART riders per weekday exited the Dublin/Pleasanton Station.

The BART fleet includes 669 revenue vehicles: 59 A2 cars, 380 B2 cars, 150 C1 cars, and 80 C2 cars. The shortest BART train consists of three cars, while the longest consists of 10 cars. A2 cars, which can operate only as lead or trail cars, have an operator's cab, automatic train operating equipment, and a two-way communications system; they can seat 60 customers comfortably and can carry over 200 customers in a crush load. B2 cars, which can operate only in the middle of a train, have the same carrying capacity as A2 cars; they do not have a cab and cannot control train operations. C1 cars are equipped with an operator's compartment, automatic train control equipment, and a communications system; they can operate as either lead, trail, or middle cars, allowing for train size to be changed without rerouting to a storage yard. C2 cars are nearly identical to C1 cars.

Other Transit Services

This subsection describes other transit services that connect to BART or operate near the Dublin/Pleasanton Station. The Livermore-Amador Valley Transit Authority (LAVTA), San Joaquin Regional Transit District (RTD), Stanislaus Regional Transit, County Connection, and Modesto Area Express (MAX) operate public bus services in the study area. The San Joaquin Regional Rail Commission (SJRRC) is the owner and operator of the commuter rail service in the study area known as the Altamont Corridor Express (ACE). Table 3.2-2 provides a detailed summary of the transit routes serving the study area. LAVTA is the primary bus service provider in the Tri-Valley Area (including the cities of Dublin, Pleasanton, and Livermore). LAVTA currently operates five routes in the study area, all of which connect to the Dublin/Pleasanton Station.

Table 3.2-2: Surrounding Transit Services, Existing

Operator	*Route*	*Existing Peak Headway*	*Existing Service Span*	*Route Overview*
LAVTA	10	30 min	▪ Weekday: 4:00 a.m. – 1:14 a.m. ▪ Saturday: 4:57 a.m. – 1:14 a.m. ▪ Sunday: 5:17 a.m. – 1:14 a.m.	LLNL to Dublin/Pleasanton Station (to Stoneridge Mall on weekends and M–F 7:20–11:56 p.m. only).
LAVTA	12	30 min	▪ Weekday: 6:00 a.m. – 10:40 p.m. ▪ Weekend *(Sunday only)*: 6:00 a.m. – 10:40 p.m.	Livermore Transit Center to Stoneridge Mall via Dublin/ Pleasanton Station
LAVTA	12X	45 min	▪ Weekday: 6:00 a.m. – 9:15 p.m. ▪ Weekend: *No service*	Livermore Transit Center, Valley Care Livermore Campus, Airway Park and Ride, Las Positas College, Kitty Hawk/Armstrong, Dublin Boulevard/Fallon intersection, East Dublin/Pleasanton Station
LAVTA	20X	45 min	▪ Weekday: 6:15–10:00 a.m. & 4:00–6:40 p.m. ▪ Weekend: *No service*	Dublin/Pleasanton Station, Greenville Road, LLNL/SNL, Livermore Transit Center
LAVTA	Rapid Route	15 min	▪ Weekday: 5:30 a.m. – 8:00 p.m.	Dublin/Pleasanton Station to Livermore Transit Center
RTD	150	60 min	▪ Weekday: 4:10 a.m. – 10:20 p.m. ▪ Weekend: *No service*	Stockton Downtown Transit Center, Stockton-Michigan Park & Ride, Lathrop: Save Mart, Tracy Transit Station, Dublin/Pleasanton Station
MAX	BART Express	60 min (two inbound trips in a.m. and two	▪ Weekday: 4:40–9:00 a.m. & 3:45–8:00 p.m. ▪ Weekend: *No service*	Modesto Downtown Transportation Center, Sisk Road Orchard Supply Hardware Parking Lot

Table 3.2-2: Surrounding Transit Services, Existing

Operator	*Route*	*Existing Peak Headway*	*Existing Service Span*	*Route Overview*
		outbound trips in p.m.)		(Modesto), Dublin/Pleasanton Station
SJRRC	ACE	30 min (four inbound trips in a.m. and four outbound trips in p.m.)	▪ Weekday: 4:20–9:17 a.m. & 3:35–8:50 p.m. ▪ Weekend: *No service*	Downtown Stockton Transit Center to San Jose (via Livermore and Pleasanton)
StaRT	Commuter	One trip per peak period, peak direction	Weekday: 4:15–6:10 a.m. & 4:20–6:20 p.m.	Turlock, Patterson, Pleasanton via I-5 and I-580
County Connection	35	30 min (peak) 60 min (off peak)	▪ Weekday: 6:00 a.m. – 8:17 p.m. ▪ Weekend: *No service*	San Ramon Transit Center, Bollinger Canyon Road, Dougherty Road, Dublin/Pleasanton Station
County Connection	36	60 min	▪ Weekday: 6:15 a.m. – 9:00 p.m. ▪ Weekend: *No service*	San Ramon Transit Center, San Ramon, Dublin/Pleasanton Station
County Connection	97X	30 min (peak) No off-peak service	▪ Weekday: 6:30 a.m. – 7:00 p.m.	Bishop Ranch Express, South: Dublin/Pleasanton Station to Bishop Ranch

Notes:

This table refers to existing surrounding transit services prior to implementation of Wheels Forward Plan.

min = minutes; LAVTA = Livermore-Amador Valley Transit Authority; RTD = San Joaquin Regional Transit District; MAX = Modesto Area Express; StaRT = Stanislaus Regional Transit; SJRRC = San Joaquin Regional Rail Commission; LLNL = Lawrence Livermore National Laboratory; SNL = Sandia National Laboratories.

Sources: Livermore-Amador Valley Transit Authority (LAVTA), 2014; San Joaquin Regional Transit District (RTD), 2016; Stanislaus Regional Transit (StaRT), 2016; County Connection, and Modesto Area Express (MAX), 2016; San Joaquin Regional Rail Commission (SJRRC), 2016

The RTD is the regional transit provider for San Joaquin County, with one express route that connects the Stockton Downtown Transit Center to the Dublin/Pleasanton Station.

The MAX operates one route between the Modesto Downtown Transportation Center and the Dublin/Pleasanton Station.

The SJRRC operates four ACE trains in the peak direction between Stockton and San Jose via downtown Livermore and Pleasanton. The SJRRC is currently in the process of seeking environmental approval for ACEforward, an improvement plan to enhance reliability and service along the ACE corridor. The SJRRC issued a Draft EIR for ACEforward in April 2017. The ACEforward Draft EIR primarily focuses on near-term improvements to ACE service, including expanding from four to six daily trains and extending service to Modesto. Potential long-term improvements include expanding service from six to 10 daily trains and extending service to Merced. In addition, the ACEforward EIR considers long-term alternatives for a connection in the Tri-Valley between the ACE regional rail system and the BART system. These BART connection alternatives include (1) extending ACE itself, or a DMU, EMU, or bus connection to BART's Dublin/Pleasanton Station; (2) bus service from ACE's Pleasanton Station to BART's West Dublin/Pleasanton Station; (3) extending BART to ACE's existing Livermore and Vasco Road Stations (with intermodal station features located either at the Livermore Station or the Vasco Road Station); (4) extending BART to meet ACE at a proposed new station at Greenville Road; and (5) extending ACE or a DMU, EMU, or bus connection to BART's proposed Isabel Avenue Station. In total, there are 11 long-term alternatives for connecting ACE to BART, while a proposed project to achieve such connection remains to be identified at a future date. The ACEforward EIR does not provide project-level environmental analysis of any BART connection alternative; such analysis must be conducted before SJRCC or another lead agency can decide whether to proceed with a project connecting ACE to BART. While a future extension of BART further east of Isabel to connect to ACE, or a westerly extension of ACE service to connect with BART are being studied, these connections have not been environmentally cleared nor funded for construction, and therefore are not reasonably foreseeable future projects for purposes of this EIR.

In the current condition, there are bus shuttles connecting BART to the ACE Pleasanton Station, operated by LAVTA, including Route 53 to the West Dublin/Pleasanton Station and Route 10 to the Dublin/Pleasanton Station. Stanislaus Regional Transit provides bus service in Stanislaus County. The operator runs one commuter route to the existing Dublin/Pleasanton Station, starting from Turlock, via Patterson.

County Connection provides fixed-route and paratransit service in Contra Costa County. County Connection runs three routes to the Dublin/Pleasanton Station.

The existing annual weekday ridership for key surrounding transit services within the study area is presented in Table 3.2-3.

Table 3.2-3: Weekday Ridership, Existing

Operator	*Route*	*Ridership*
LAVTA	10	1,547
LAVTA	12/12X	651
LAVTA	20X	38
LAVTA	Rapid Route/30R	1,773

Source: Livermore-Amador Valley Transit Authority (LAVTA), 2016

Pedestrian and Bicycle Network

The Planning Area and nearby surroundings include several activity centers, parks, recreational facilities, and other key destinations that are expected to generate bike and foot traffic, should bike facilities be available. These destinations include:

- Las Positas College, with an enrollment of about 10,000 students;
- The Class I trails and bikeways in the area (see the following section);
- Shea Montage, across the street from Las Positas College to the south, and a smaller residential area southwest of the college;
- Shea Homes' Sage Project, under construction at the southeast corner of Isabel Avenue and Portola Avenue, consisting of 476 dwelling units;
- The residential neighborhood south and east of East Airway Boulevard, Sutter Street, Stetson Way and Stealth Street, and including Maitland Henry Park, a neighborhood park with a tot lot, barbecue pits and picnic tables, at Mendocino Road and Alameda Drive;
- Cayetano Park, near the corner of Portola Avenue and Isabel Avenue-Campus Hill Drive, with sports fields, play area and dog park; and
- Livermore Downs, a neighborhood park with a tot lot and tennis courts, at Paseo Laguna Seco and Portola Avenue.

Existing Bikeway and Trail Facilities

The Planning Area currently benefits from a network of Class II bicycle lanes, defined as a striped lane for one-way bike travel, as well as Class I trails, defined as separated paths suitable for use by pedestrians and bicyclists. In the Planning Area, many of the existing Class I trails are essentially wide sidewalks. Figure 3.2-4 shows the network of existing bikeways and Class I trails in and near the Planning Area.

Figure 3.2-4 also shows bikeways and Class I trails planned for the Isabel Neighborhood Plan, either as part of the Isabel Neighborhood plan or other existing City plans or programs. These will be discussed in the impact analysis below. Roughly from west to east and north to south, the existing bikeways, followed by the existing trails, are:

- Bike lanes on the entire length of North Canyons Parkway and Portola Avenue through the project area;
- Bike lanes on Airway Boulevard from Isabel Avenue to North Canyons Parkway;
- Bike lanes along Collier Canyon Road and Constitution Drive from Campus Loop south to Independence Drive;
- Bike lanes on Isabel Avenue from Portola Avenue past the southern boundary of the Planning Area;
- Bike lanes along most of Campus Loop;
- Trails along Collier Canyon Road and Collier Canyon Channel from Portola Avenue south to Constitution Drive;
- Trail along Campus Loop from Collier Canyon Road to Campus Hill Drive;
- Trail along Campus Hill Drive from Campus Loop to Isabel Avenue; and
- Trail along and beyond Stealth Street to the north, along and beyond Stetson Way to the west and along Sutter Street to East Airway Boulevard.

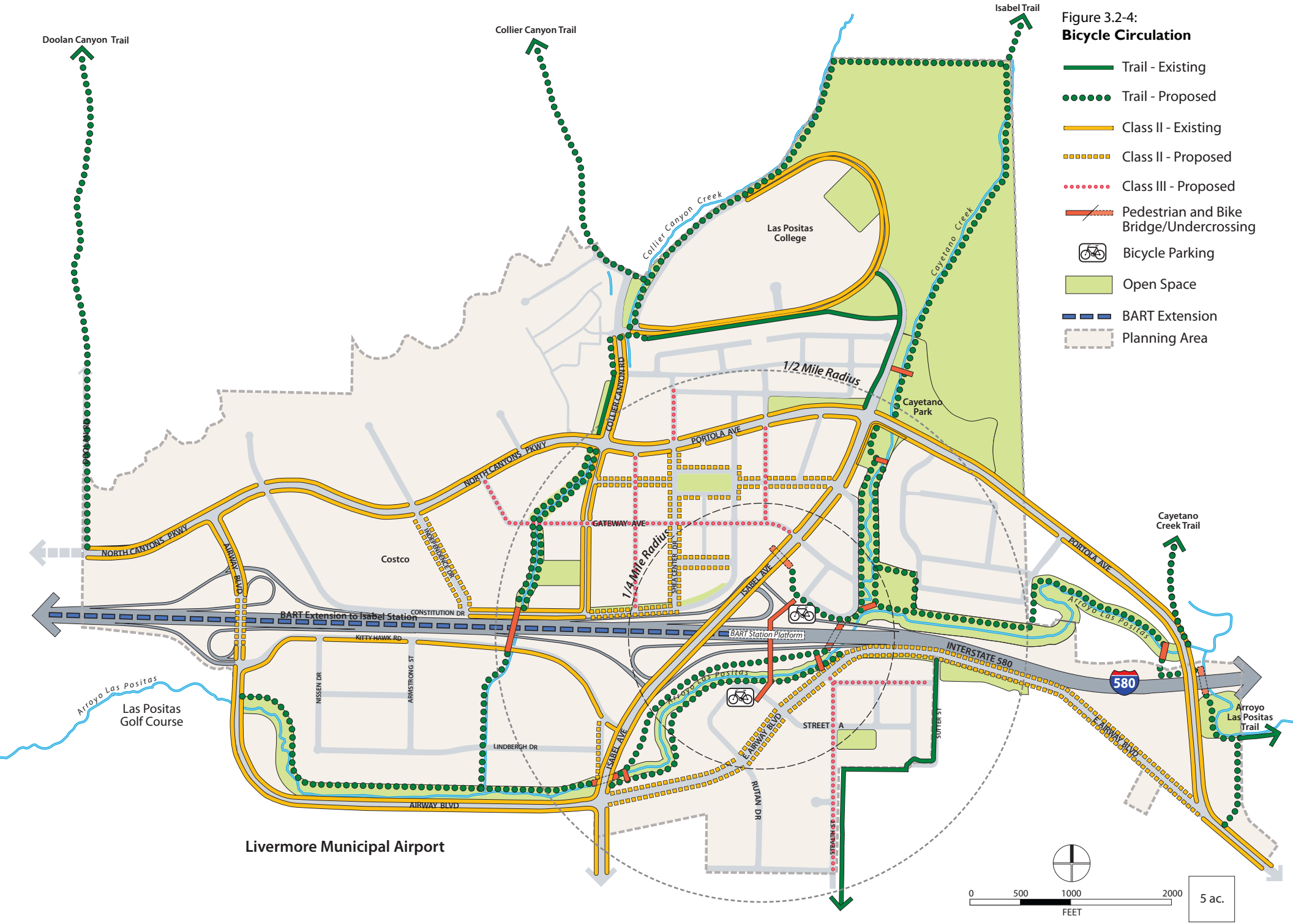


Figure 3.2-4:
Bicycle Circulation
Trail - Existing
Trail - Proposed
Class II - Existing
Class II - Proposed
Class III - Proposed
Pedestrian and Bike Bridge/Undercrossing
Bicycle Parking
Open Space
BART Extension
Planning Area
Doolan Canyon Trail
Collier Canyon Trail
Isabel Trail
Collier Canyon Creek
Cayetano Creek
Las Positas College
1/2 Mile Radius
1/4 Mile Radius
Cayetano Park
COLLIER CANYON RD
PORTOLA AVE
NORTH CANYONS PKWY
GATEWAY AVE
SHERIDAN LN
Costco
AIRWAY BLVD
CONSTITUTION DR
BART Extension to Isabel Station
BART Station Platform
KITTY HAWK RD
NISSEN DR
ARMSTRONG ST
LINDBERGH DR
ISABEL AVE
FAIRWAY BLVD
STREET A
SOUTER ST
RUTAN DR
STEALTH ST
INTERSTATE 580
580
Cayetano Creek Trail
Arroyo Las Positas Trail
Arroyo Las Positas
Las Positas Golf Course
Livermore Municipal Airport
0
500
1000
2000
FEET
5 ac.

Existing Pedestrian Facilities

Figure 3.2-5 diagrams the existing and proposed pedestrian network throughout the Isabel Neighborhood, including crosswalks, bridges, under-crossings, and Class I trails. The diagram shows that existing trails connect Las Positas College, Collier Canyon Road, Isabel Avenue, and Portola Avenue, as well as along Sutter Street and Stealth Street. Planned trails extend the network to create a complete loop along College Loop, the Arroyo Las Positas, Airway Boulevard, and Collier Canyon Creek. All Class I trails identified on this diagram are completely separated from the vehicular right-of-way and for the exclusive use of bicycles and pedestrians. All pedestrian facilities are discussed in the impact analysis below.

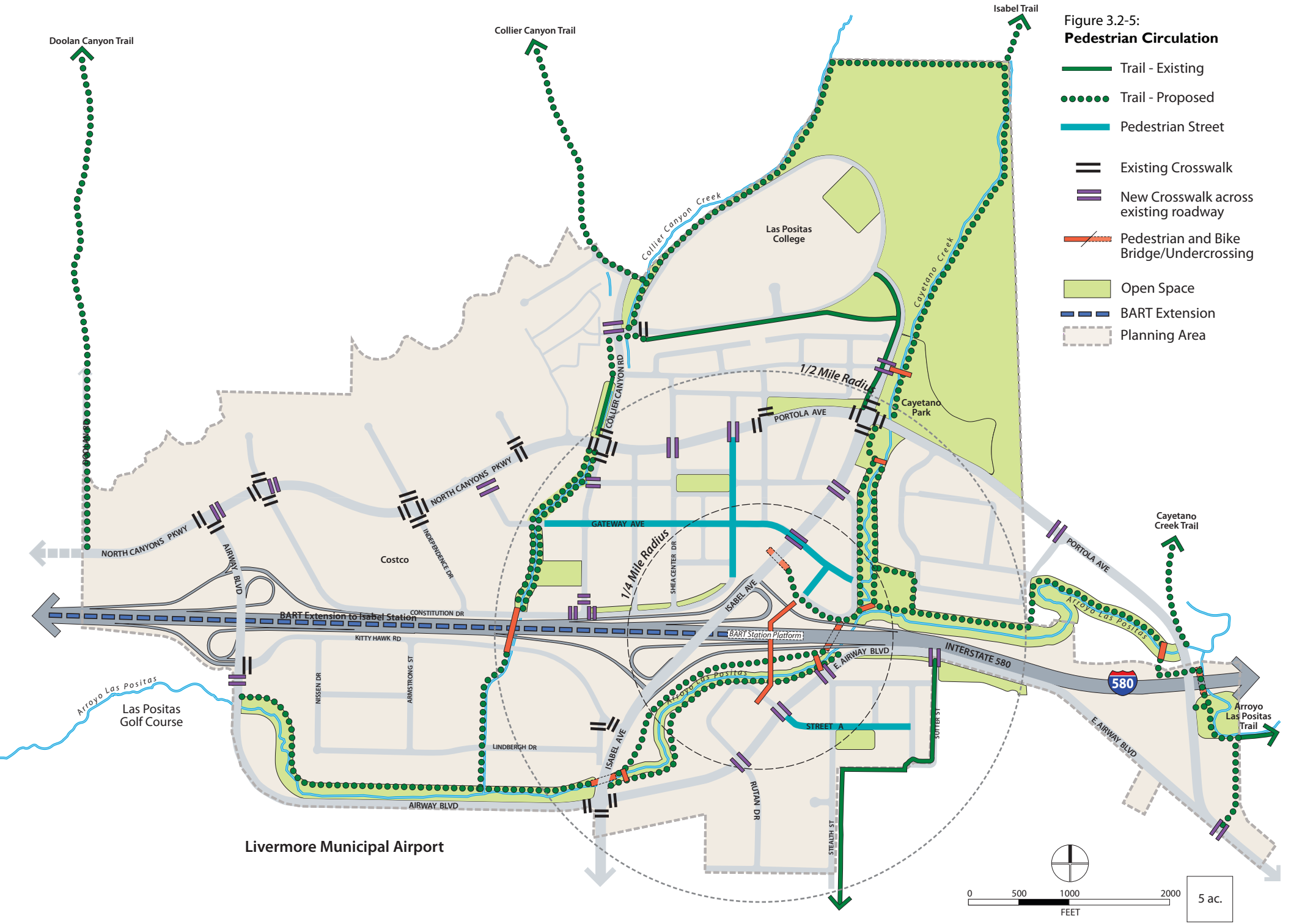


Figure 3.2-5:
Pedestrian Circulation
Trail - Existing
Trail - Proposed
Pedestrian Street
Existing Crosswalk
New Crosswalk across existing roadway
Pedestrian and Bike Bridge/Undercrossing
Open Space
BART Extension
Planning Area
Doolan Canyon Trail
Collier Canyon Trail
Isabel Trail
Collier Canyon Creek
Las Positas College
Cayetano Creek
1/2 Mile Radius
Cayetano Park
COLLIER CANYON RD
PORTOLA AVE
POOL MAIN
NORTH CANYONS PKWY
INDEPENDENCE DR
AIRWAY BLVD
Costco
GATEWAY AVE
1/4 Mile Radius
SHEA CENTER DR
ISABEL AVE
Cayetano Creek Trail
BART Extension to Isabel Station
CONSTITUTION DR
KITTY HAWK RD
BART Station Platform
Arroyo Las Positas
INTERSTATE 580
E AIRWAY BLVD
580
Arroyo Las Positas Trail
Las Positas Golf Course
NISSEN DR
ARMSTRONG ST
LINDBERGH DR
STREET A
SOUTER ST
RUTAN DR
STEALTH ST
Livermore Municipal Airport
0
500
1000
2000
FEET
5 ac.

REGULATORY SETTING

State Regulations

Senate Bill 743

Senate Bill (SB) 743, signed into law in 2013, requires CEQA lead agencies to shift from using traditional LOS standards and automobile delay to determine significant traffic impacts. Under SB 743, the State Office of Planning and Research is required to update CEQA guidelines and criteria to promote greenhouse gas emissions reductions, multimodal transportation networks and diverse land uses. The Office of Planning and Research proposes using VMT as the metric for evaluating the significant traffic impacts, where projects that decrease VMT compared to existing conditions may be considered to have a less than significant transportation impact. SB 743 provides that, once the State adopts updated CEQA Guidelines for alternatives to LOS-based significance determinations, automobile delay as described by LOS shall not be considered a significant impact on the environment. However, the State guidelines are still under development. Accordingly, the City of Livermore has determined to utilize the LOS-based methodology for significance determination in this EIR.

Caltrans

Within the Planning Area, Interstate 580 (I-580), a major east-west aligned route, is operated by Caltrans. The following is a summary of Caltrans policies that are intended specifically for situations where state-operated routes interact with City facilities.

Caltrans Deputy Directive 64-R2: Complete Streets – Integrating the Transportation System

In 2001, Caltrans adopted Deputy Directive (DD) 64; a policy directive related to non-motorized travel throughout the state. In October 2014, DD 64 was strengthened to reflect changing priorities and challenges. DD 64-R2 states:

> *The California Department of Transportation (Caltrans) provides for the needs of travelers of all ages and abilities in all planning, programming, design, construction, operations, and maintenance activities and products on the State highway system. Caltrans views all transportation improvements as opportunities to improve safety, access, and mobility for all travelers in California and recognizes bicycle, pedestrian, and transit modes as integral elements of the transportation system.*
>
> *Caltrans develops integrated multimodal projects in balance with community goals, plans, and values. Addressing the safety and mobility needs of bicyclists, pedestrians, and transit users in all projects, regardless of funding, is implicit in these objectives. Bicycle, pedestrian, and transit travel is facilitated by creating "complete streets" beginning early in system planning and continuing through project delivery and maintenance and operations. Developing a network of "complete streets" requires collaboration among all Department functional units and stakeholders to establish effective partnerships.*

Caltrans states that the goal of complete streets is to "provide safe mobility for all users, including motorists, bicyclists, pedestrians and transit riders". Furthermore, Caltrans states that successful long-term implementation of this policy is intended to result in more options for people to go from

one place to another, less traffic congestion and greenhouse gas emissions, more walkable communities, and fewer barriers for older adults, children, and people with disabilities.

Director's Policy 22 (DP-22), "Director's Policy on Context Sensitive Solutions"

Director's Policy 22, a policy regarding the use of "Context Sensitive Solutions" on all state highways, was adopted by Caltrans in November of 2001. The policy reads:

> *The Department uses "Context Sensitive Solutions" as an approach to plan, design, construct, maintain, and operate its transportation system. These solutions use innovative and inclusive approaches that integrate and balance community, aesthetic, historic, and environmental values with transportation safety, maintenance, and performance goals. Context sensitive solutions are reached through a collaborative, interdisciplinary approach involving all stakeholders.*
>
> *The context of all projects and activities is a key factor in reaching decisions. It is considered for all State transportation and support facilities when defining, developing, and evaluating options. When considering the context, issues such as funding feasibility, maintenance feasibility, traffic demand, impact on alternate routes, impact on safety, and relevant laws, rules, and regulations must be addressed.*

The policy recognizes that "in towns and cities across California, the State highway may be the only through street or may function as a local street," that "these communities desire that their main street be an economic, social, and cultural asset as well as provide for the safe and efficient movement of people and goods," and that "communities want transportation projects to provide opportunities for enhanced non-motorized travel and visual quality." The policy acknowledges that addressing these needs will assure that transportation solutions meet more than just traffic and operational objectives.

Caltrans Guide for the Preparation of Traffic Impact Studies

The Caltrans Guide for the Preparation of Traffic Impact Studies, 2002, includes criteria for evaluating the effects of land use development and changes to the circulation system on State highways. Caltrans endeavors to maintain a target LOS at the transition between LOS C and LOS D.

The California Department of Transportation (Caltrans) endeavors to maintain a target LOS at the transition between LOS C and LOS D on State highway facilities; however, Caltrans recognizes that achieving LOS C/LOS D may not always be feasible (Caltrans, 2002). This analysis uses a standard of LOS E or better during peak hours as the planning objective for the evaluation of potential impacts of this development on Caltrans facilities, as that is the standard set by Alameda CTC for monitoring Caltrans facilities in the study area (Alameda CTC, 2015).

Local Regulations

Alameda CTC

Alameda CTC does not have adopted thresholds of significance applicable to CEQA requirements for freeway analysis purposes (Alameda CTC, 2015). Alameda CTC's freeway monitoring efforts set LOS E as the standard for monitoring performance (Alameda CTC, 2015).

Livermore Bikeways and Trails Master Plan

Effective 2001, the Livermore Bikeways and Trails Master Plan includes policies guiding new development projects to include trail and bikeway facilities to facilitate on-site circulation for non-motorized modes of travel. The Bikeways and Trails Master Plan also guides the implementation of connections to the bikeways and trails system from all existing and future transit facilities, stations, and terminals in Livermore; safe and efficient off-street and on-street crossings of I-580 that make logical connections to the bikeways and trails; and connections between school/work/public facility areas to residential areas. The City is currently preparing an Active Transportation Plan, which will supersede the Bikeways and Trails Master Plan.

City of Livermore General Plan

The City of Livermore General Plan stipulates a transportation goal to "maintain adequate levels of service for all areas of the City." "The upper limit of acceptable service at signalized intersections shall be mid-level D, except in the Downtown Area and near freeway interchanges…The upper limit of acceptable level of service at selected intersections near freeway interchanges shall be LOS E" (City of Livermore, 2014). In addition, the General Plan identifies selected intersections that may exceed the LOS standard.

The Circulation Element of the Livermore General Plan provides the policy framework for regulation and development of the City's transportation system. This Element includes policies to plan for Complete Streets, promote multimodal transportation, provide a pedestrian network that encourages walking for transportation and recreation, and provide safe and convenient bicycle parking.

BART Station Access Guidelines and Policy

BART adopted its Station Access Policy in June 2016 to support livability goals for the Bay Area, reinforce sustainable communities, and enable riders to get to and from stations safely, comfortably, affordably and cost-effectively. The policy also sets priorities for BART resources by identifying access goals for the system and each station. The policy created a station access mode hierarchy.

The policy created a station access investment framework that categorizes stations by type. The Dublin/Pleasanton Station is designated as an auto-dependent station, but BART and the City of Livermore have discussed that the proposed Isabel Station would be designated as a "Balanced-Intermodal" station. For auto-dependent stations, the primary investment mode is walking, and the secondary investment modes are biking, drop-off, auto parking and transit.

For Balanced-Intermodal stations, the new Isabel Station would be designed to promote higher mode splits for transit pedestrian and bicycle access and less reliant on drive-and-park access.

To support the Station Access Policy goal, BART has created Multimodal Access Design Guidelines (MADG), August 2017, to describe design elements and principles that support enhanced bicycle and pedestrian access to new stations. Relevant BART Station Access Guidelines for bicycle access include the following:

- Bikeways shall be designed to provide a direct, convenient connection between the station and any existing or proposed bike routes throughout the community, and to provide a continuous facility for cyclists crossing station property.
- Bikeways shall allow bicyclists approaching the station structure to reach the main entrance by a safe and relatively direct route, with a convenient and clearly marked bikeway between bicycle parking and bicycle access points at station perimeters. Design bicycle access routes to be separate from motor vehicle traffic, and minimize conflict with other modes to maximize comfort for all users.

The BART Bicycle Plan: Modeling Access to Transit (2012) supports BART'S commitment to encouraging bicycle travel to stations, including the goal to double BART's bicycle access modal split to 8 percent of all trips by 2022 (BART, 2012).

Through the MADG, BART has also identified pedestrian access design guidelines for its stations. Per BART, the Station Access Performance targets from 2016 propose to increase active access (walk, bike) from 44 percent (baseline) to 52 percent (by 2025) (BART, 2016). The relevant guidelines also listed in the BART Bicycle Program Capital Plan (BART, 2017) are as follows:

- Direct and safe approach for pedestrians shall be provided from all adjacent streets to the faregate entrance. A pedestrian's path from bus drop-off areas and light rail stops to faregate entrances shall be as direct as possible. The alignment of walkways should be as direct as possible. The required walkway width may be determined on the basis of the expected peak pedestrian volumes and the design capacity or service level of the walkway.
- Prioritize pedestrian movements in and around BART property by providing continuity between station faregate entrances and sidewalks at station edges, and by incorporating traffic-calming measures at conflict points between pedestrian and vehicle travel. The path from the parking lot edges and adjacent sidewalks to the faregate entrances shall accommodate pedestrian desire lines to be as short and direct as possible.

Impact Analysis

SIGNIFICANCE CRITERIA

Implementation of the proposed Plan would have a potentially significant adverse impact if it would:

Criterion 1: Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit.

Criterion 2: Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways.

Criterion 3: Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks.

Criterion 4: Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment).

Criterion 5: Result in inadequate emergency access.

Criterion 6: Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities.

Applicable criteria related to the standards of significance above are described below.

Freeway Segments

This EIR uses the following criteria to identify impacts to freeway facilities:

- If a freeway segment is projected to operate at LOS E or better without the project and the project is expected to cause the segment to operate at LOS F, the project impact is considered significant.
- If a freeway segment is projected to operate at LOS F without the project and the project is expected to increase the volume-to-capacity (V/C) ratio on the freeway segment by more than 2 percent, the project impact is considered significant.

CMP Arterial Segments

This EIR uses the following criteria to identify impacts to CMP arterial facilities:

- If an arterial segment is projected to operate at LOS E or better without the project and the project is expected to cause the segment to operate at LOS F, the project impact is considered significant.
- If an arterial segment is projected to operate at LOS F without the project and the project is expected to increase the volume-to-capacity (V/C) ratio on the arterial segment by more than 5 percent, the project impact is considered significant.

Local Roadway Intersections

Performance standards for traffic are described below.

City of Livermore

An intersection impact would occur if, in either the AM or PM peak hour, the proposed Plan resulted in the following:

- An intersection operating at an acceptable mid-level LOS D or better (corresponding to an average delay of 45 seconds per vehicle) under No Project Conditions degraded to an unacceptable high of LOS D or worse under Project Conditions.
- An intersection near the freeway operating at an acceptable LOS E or better (80 seconds per vehicle) under No Project Conditions degraded to an unacceptable LOS F under Project Conditions.
- An intersection operating at substandard LOS under No Project Conditions increased average delays by more than 5 seconds per vehicle.

Transit

The primary policy goals of the transit agencies in the study area emphasize increasing ridership, improving access to BART, and reducing system inefficiencies. A significant impact would result if the proposed Plan were to directly impede any of the relevant transit agencies from implementing planned improvements and/or their ability to meet these goals. Therefore, a significant impact would occur if the proposed Plan resulted in the following:

- Impeded connecting transit services from increasing ridership;
- Impeded connecting transit services from improving their access to BART; or
- Impeded connecting transit services from reducing system inefficiencies.

Bicyclists

There are no established criteria for the assessment of bicycle impacts. For this EIR, an impact on bicycles would occur if the proposed Plan performs substantially worse than existing conditions in the Planning Area in terms of bicycle circulation, access, and safety.

Pedestrians

There are no established criteria for the assessment of pedestrian impacts. For this EIR, an impact on pedestrians would occur if the proposed Plan performs substantially worse than existing conditions in terms of pedestrian crossing distance at study intersections, crossing delay at study intersections, circulation and access within the study area, and safety within the Planning Area.

Construction Impacts to Transportation

A significant impact would occur if construction activities of the proposed Plan resulted in a substantial delay, safety hazard, or diminished access.

METHODOLOGY AND ASSUMPTIONS

Isabel Neighborhood Plan Analysis

Traffic for the proposed Plan was assessed for 2025 Near Term and 2040 Cumulative Conditions. The BART extension was not assumed as part of No Project Conditions. But both 2025 and 2040 Plus Project Conditions did assume the full conventional BART extension together with buildout of the INP (partial buildout in 2025, and full buildout by 2040).

Traffic Modeling

Traffic modeling for the Neighborhood Plan was based directly on the modeling from the BLVX study. The BLVX study used the Alameda CTC Countywide Travel Demand Model with Association of Bay Area Governments (ABAG) Plan Bay Area Projections and network assumptions. The model has a base year of 2013, and horizon years of 2025 and 2040 conditions. Year 2025 and 2040 No Project Conditions include Plan Bay Area land use assumptions outside of the INP area and Livermore General Plan assumptions within the INP area. Additional modeling was conducted to represent the future INP circulation in more detail than was represented in the BLVX modeling. The more detailed modeling was used to generate and distribute the INP area trips to the new streets and connections to the existing city arterials so that detailed traffic operational analysis could be conducted to determine access control and size the new streets and intersections.

Freeway Segments

This EIR uses a modified version of Alameda CTC's Countywide Travel Demand Model to generate future-year peak-period volumes. These volumes are used to calculate V/C ratios according to the 1985 HCM (Transportation Research Board, 1985), to be consistent with Alameda CTC's Congestion Management Program (Alameda CTC, 2015). The peak-hour volume on a segment in each direction is compared to the segment's vehicle carrying capacity (i.e., the V/C ratio is calculated). Segment capacity is calculated as 2,000 vehicles per hour per lane multiplied by the number of lanes.

Table 3.2-4 summarizes LOS and V/C thresholds for freeway segments. Results for general purpose lanes and high-occupancy vehicle (HOV)/express lanes are shown separately.

Table 3.2-4 Level of Service Criteria – Freeway Segments

Level of Service	*Average Travel Speed*	*Volume/Capacity Ratio*
A	≥ 60	0.35
B	≥ 55	0.58
C	≥ 49	0.75
D	≥ 41	0.90
E	≥ 30	1.00
F	< 30	-

Source: Transportation Research Board, 1985.

Local Roadway Intersections

For signalized intersections in the study area, the analysis calculated the average delay per vehicle using the HCM 2000 methodology, via Synchro 7 traffic analysis software, to determine LOS, as shown in Table 3.2-5. If the V/C ratio was found to exceed 1.0, regardless of the delay, the analysis assigned LOS F.

Table 3.2-5 Level of Service Criteria – Signalized Intersections

Average Control Delay (sec/veh)	*Level of Service*
≤ 10	A
>10–20	B
>20–35	C
>35–55	D
>55–80	E
>80	F

Note: sec/veh = seconds per vehicle

Source: Transportation Research Board, 2000.

For unsignalized intersections in the study area, the analysis used HCM 2000 methodology, determining the LOS by calculating the weighted average control delay, expressed in seconds per vehicle, as illustrated in Table 3.2-6. Control delay includes the sum of all individual movements that a vehicle might make at an unsignalized intersection, including initial deceleration delay, queue move-up time, stopped delay, and final acceleration. At two-way stop-controlled intersections, LOS was calculated for each controlled movement, as opposed to the intersection as a whole. If the V/C ratio of a lane was found to exceed 1.0, regardless of the control delay, the analysis assigned LOS F.

Table 3.2-6 Level of Service Criteria – Unsignalized Intersections

Average Control Delay (sec/veh)	*Level of Service*
≤ 10	A
>10–15	B
>15–25	C
>25–35	D
>35–50	E
>50	F

Note: sec/veh = seconds per vehicle

Source: Transportation Research Board, 2000.

Future Planned Roadway Improvements

The following roadway improvements are planned for the study area:

- City Traffic General Plan Improvements
    - Portola overpass widening
    - Isabel Avenue Widening/Improvements
    - Dublin Bl. - North Canyon Parkway Connection
    - New traffic signals
- BART Proposed Improvements
    - Airway Widening
- INP Proposed improvements (refer to street network diagram)
    - Airway Widening
- Off-site intersection improvements:
    - The intersection of Portola Avenue/ East Airway Boulevard (Intersection 17) will be improved as part of the INP Project to include a signal and addition of a second northbound left-turn lane.
    - The intersection of Portola Avenue/ Murrieta Avenue (Intersection 2) will be improved as part of the INP Project to include the addition of a second northbound left-turn lane. This improvement is also part of the City Transportation Improvement Program (TIP).
    - Local Street types

Future Bicycle and Pedestrian Facilities

Figure 3.2-4 diagrams an extensive network of Class I trails throughout the Isabel Neighborhood as well as pedestrian bridges and under-crossings that complete the trail network. Within the Isabel Neighborhood, the trails provide continuous creekside access and routes to the station that are separated from both fast-moving traffic and expanses of parking. The trails include paved paths as well as unpaved trails for bicyclists, pedestrian, and hikers alike. All Class I trails identified on this

diagram are completely separated from the vehicular right-of-way and for the exclusive use of bicycles and pedestrians.

Many of the trail alignments indicated are part of projects already underway or are already identified in local and regional trail plans. The trail segments along the east side of the Cayetano seasonal drainage area south of Portola Avenue and the trail segment that extends east to Portola Avenue and under I-580 are already planned as part of the Sage project, with a planned completion date is 2018. In addition, the trail network links to the citywide and Regional Trail Network, which includes trails leading eastward along the Arroyo Las Positas and northward into the hillsides (Doolan Trail, Collier Canyon Trail, Isabel Trail, and Cayetano Creek Trail) and eastward along the Arroyo Las Positas.

New trail segments that augment the network of planned improvements include trails in the vicinity of Las Positas College; along Collier Canyon Creek between Portola Avenue and Constitution Drive; along Arroyo Las Positas from the Airway Boulevard interchange to I-580, utilizing a Zone 7 maintenance road and the BART parking site; and along the west side of the Cayetano seasonal drainage area, linking to the future BART station. Improvements also include trails along the west side of Collier Canyon Creek from Portola Avenue to the Arroyo Las Positas and along the north side of the Arroyo Las Positas between I-580 and Isabel Avenue. These segments would be parallel to trails on the opposite sides of the creek, creating mini-loops and further increasing access to natural areas. The trail network would ultimately create a loop around the core of the neighborhood, completely separated from automobile traffic.

Undercrossings across roadways and waterways along this trail network include:

- **The Isabel Path.** A central feature of the Isabel Neighborhood, the Isabel Path is a pedestrian- and bicycle-only grade-separated undercrossing across Isabel Avenue between the I-580 ramps and Gateway Avenue. The path establishes direct access between the BART pedestrian bridge point-of-contact area and the Isabel Center/Main Street area. While the Plan envisions that the Isabel Path will be an under-crossing under Isabel Avenue, options for a crossing design may also include a pedestrian bridge at the same location or an at-grade crosswalk with a signal. Since Isabel Avenue will continue to be a four-lane major street, a grade-separated crossing would be the safest and most convenient option, although at-grade crosswalks at the nearby signalized intersections would still be provided. Given the topography of the site, which gently slopes up to the north, an undercrossing would require minimal grading and would keep the pathway relatively level. The specific crossing method will be determined as part of the development process for the BART-owned property and/or retail site.
- **Portola Avenue under-crossing.** While this undercrossing under I-580 along the Arroyo Las Positas is not within the half-mile radius of the station, it will be essential in establishing pedestrian and bicycle connectivity between the Isabel Neighborhood and other neighborhoods to the southeast. The Arroyo Las Positas already passes under the I-580 at this location; the new pedestrian path will follow along the west side of the Arroyo. This improvement is part of the Shea Homes Sage project.
- **Undercrossing of I-580 at Arroyo Las Positas near BART Station.**
- **Improvements to the existing Isabel Avenue under-crossing at Airway Boulevard.**

Bridges over the waterways and roadways along this trail network include:

- **The BART pedestrian bridge**. This bridge, which is part of the BART extension project, extends from the BART parking garage south of I-580, to the station platforms in the freeway median, to the north side of I-580. Both segments of this pedestrian bridge will be available to non-BART patrons.
- **Over the Arroyo Las Posita**s, connecting the trail to the intersection of Isabel Avenue and Heligan Lane.
- **Over the seasonal drainage channel in the northwest corner of the Shea Homes Sage site**. This is included as part of the Shea Homes Sage project.
    - Over the seasonal drainage channel in the southwest corner of the Shea Homes Sage site.
- **Over the Arroyo Las Positas near the Portola Avenue overpass**, connecting the new Portola Avenue undercrossing to the north side of the Arroyo.
- **Collier Canyon Creek Bridge** over I-580 at the Collier Canyon Creek alignment.
- **Just east of the Airway Boulevard and Isabel Avenue intersection** to provide pedestrian access from the trail on the north side of the arroyo to the south side; the City of Livermore proposes to make this bridge part of the City's trail connectivity plan.
- **Over the Arroyo Las Positas north of the intersection of East Airway Boulevard and Stealth Street**.

Crosswalks

In addition to trail improvements, Figure 3.2-5 indicates where new or enhanced crosswalks are needed to create safe and visible connections across new roadways as well as access to the network of Class I trails. Figure 3.2-5 indicates where new crosswalks are required across existing roadways; however, new crosswalks are also required on all new streets with signalized or stop-controlled intersections (see Figure 3.2-1 for locations of new roadways).

Most of the existing streets in the Planning Area have continuous sidewalks and at least one crosswalk at intersections. New crosswalks on major streets will enhance connectivity of the pedestrian network and provide on-street walking loops throughout the Planning Area. Many of the new crosswalks shown on Figure 3.2-5 are located specifically to enhance access to BART from all directions via roadways and trails, decreasing exposure to fast-moving vehicles and shortening the walking trip length. These include crosswalks on East Airway Boulevard, Isabel Avenue, Constitution Drive, and Portola Avenue.

Pedestrian Streets/Streetscapes

In addition to crosswalks, Figure 3.2-5 designates a limited number of rights-of-way segments as Pedestrian Streets/ Streetscapes.

Three roadway segments within the Planning Area will be designed with a signature palette of streetscape improvements and including pedestrian-oriented facilities such as, corner bulb-outs, tree wells, street furniture, benches, specialty lighting, specialty paving, and Neighborhood identity elements such as wayfinding, public art, and special events banners. Due to their locations, most

users (residents, employees, and visitors) will traverse at least one Signature Street upon entering the Isabel Neighborhood, whether travelling by transit, car, bike, or on foot. Signature Streets include:

- **Main Street,** the central retail spine of the Isabel Neighborhood;
- **Gateway Avenue between Collier Canyon Creek and Arroyo Las Positas**, the neighborhood's central east-west connection north of I-580; and
- **Street A,** a new east-west roadway south of I-580, which leads from the BART parking garage, across E Airway Boulevard, through the new residential area.
- **BART access road,** which is the one-block roadway segment leading directly from the northern end of the BART pedestrian bridge to Gateway Avenue.

Trip Generation

Trip generation was forecast using the Alameda CTC Countywide model for all horizon years and scenarios. The model computes daily person trips and then applies mode split to generate daily vehicle trips. The model accounts for trip reduction due to internalization and mode split for carpooling, transit, bike and pedestrian modes. Daily vehicle trips are further processed into peak hour vehicle trips for the detailed peak hour impact analysis. Table 3.2-7 below summarizes the daily trips for the greater INP study area for existing conditions, 2025, and 2040, and for No Project and Plus Project Conditions. Prior to implementation of the proposed Plan, the greater study area does have existing and future land uses that generate significant daily trips.

Table 3.2-7 Daily Vehicle Trip Generation

Year	*Scenario*	*Daily Vehicle Trips*
2013	No-Project	75,301
2025	No-Project	83,522
2025	Project	88,451
2040	No-Project	111,040
2040	Project	143,771

Source: Kittelson & Associates, Inc., 2018.

VMT

Vehicle miles traveled (VMT) was forecast using the Alameda CTC Countywide model for all horizon years and scenarios. The model computes daily vehicle trips which are then assigned to the roadway network. VMT is then computed based on the average distance traveled by each vehicle and summed up for the entire project study area. VMT per capita is also computed based on the service population (jobs + residential population) in the INP study area. The VMT in this analysis was not used for impact findings, but is provided for informational purposes only. As expected, VMT increases over time due to local and regional growth. However, VMT per capita is projected to decrease due to increase in service population in the INP study area. This is related to a number of factors, including increase in population, new transit choices, shorter trip making to new destination opportunities, and more opportunities for walk and bike trips.

Table 3.2-8 below summarizes the daily VMT and per capita VMT for the greater INP study area for Existing, 2025 and 2040, and for No Project and Plus Project Conditions. Prior to the proposed Plan being implemented, the greater study area does have existing and future no-build land uses that generate significant daily VMT. Under the 2040 Plus Project Condition, the VMT increases significantly, but with the addition of the new service population (residential population + jobs), the per service population VMT reduces compared to existing conditions and to the 2040 No Project Condition.

Table 3.2-8 Daily Vehicle Miles Traveled

Year	*Scenario*	*Daily Vehicle Trips*	*Daily VMT*	*Service Population*	*Per Service Population VMT*
2013	No Project	75,301	694,152	16,864	41.2
2025	No Project	83,522	799,675	23,085	34.6
2025	Project	88,451	830,148	24,192	34.3
2040	No Project	111,040	1,048,211	27,270	38.4
2040	Project	143,771	1,348,781	36,694	36.8

Note: Service population may be different from Chapter 2: Project Description and Section 3.1, Land Use, Population, and Housing, as it accounts for an area larger than the Planning Area because the traffic model study area includes Traffic Analysis Zones that cover areas outside the Planning Area.

Source: Kittelson & Associates, Inc., 2018

The transportation analysis described in this section involved a multi-step process to generate the performance analysis metrics necessary to quantify the proposed Plan's impact. This process used a set of land use and transportation network assumptions in a travel demand model to generate projections of transit ridership, vehicle trip demand, roadway link volumes, and BART station parking demand and access by various modes (buses, bicycles, pedestrians, etc.). The process then used these outputs in freeway segment and intersection operations analysis methodologies to generate estimates of freeway and intersection performance, as described in the sections below.

BART Forecasts

The BLVX Travel Demand Model (Cambridge Systematics, 2017), a version of the Alameda CTC travel demand model customized for the BART to Livermore Extension Project, was used to forecast traffic and ridership volumes for the proposed Plan under each analyzed scenario. These forecasts were used in an operations analysis to identify impacts for the INP.

Travel demand projections were made for multiple scenarios, as follows:

- 2025 No Project Conditions
- 2025 Project Conditions, for the proposed Plan2025 Near Term Conditions, for the proposed Plan– reflecting land use growth as summarized in Section 3.1, Land Use, Population, and Housing
- 2040 No Project Conditions
- 2040 Project Conditions, for the proposed Plan– reflecting land use growth as summarized in Section 3.1, Land Use, Population, and Housing

The methodologies used to evaluate the significance of transportation impacts are described below for freeway segments, local roadway intersections, transit, bicycles, and pedestrians.

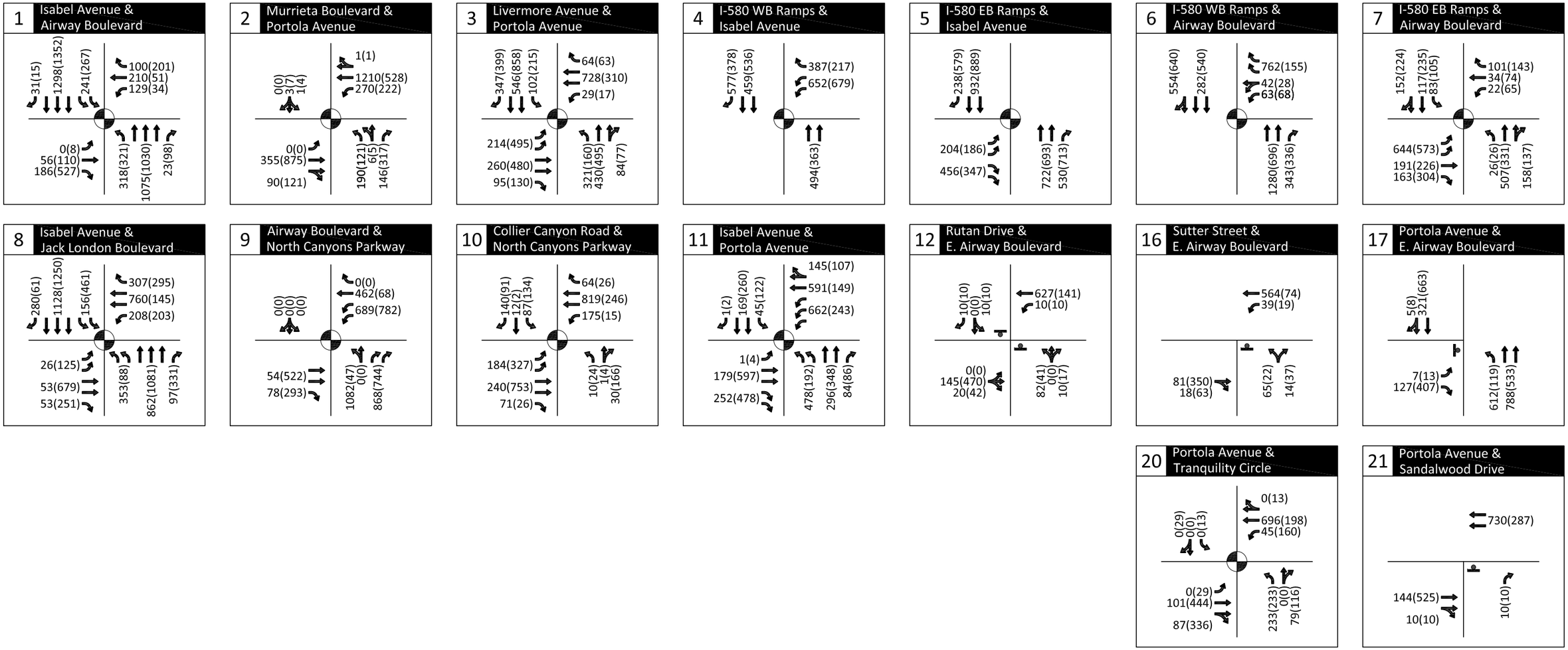
IMPACTS AND MITIGATION MEASURES

Impact 3.2-1 Implementation of the proposed Plan would conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit. ***(Significant and Unavoidable)***

2025 Near Term No Project

AM and PM peak hour volumes for 2025 Near Term No Project Conditions are presented in Figure 3.2-6. As presented in Table 3.2-9, under 2025 Near Term conditions, intersection operations are expected to degrade compared to existing conditions as a result of projected regional and local land use growth. Under 2025 Near Term conditions, land use would grow according to the City of Livermore General Plan. Based on that growth, only two study intersections would exceed the adopted significance thresholds and operate at unacceptable levels, as follows:

- Airway Boulevard/Driveway & North Canyons Parkway (Intersection #9) would operate at LOS F with an average delay of 100.9 seconds during the AM Peak hour.
- Portola Avenue/Tranquility Circle (Intersection #20) would operate at LOS D with an average delay of 46.7 seconds during the PM Peak hour.



AM(PM) - Traffic Volume

- Stop Sign

- Traffic Signal

2025 Near Term No Project Traffic Volumes
Weekday AM and PM Peak Hours
Livermore, CA

Figure
3.2-6

KITTELSON & ASSOCIATES

Table 3.2-9 2025 Near Term No Project Intersection Level of Service

#	Name	Control	Standard	AM Peak Hour			PM Peak Hour		
				V/C	Delay	LOS	V/C	Delay	LOS
1	Isabel Avenue & Airway Boulevard	Signal	Exempt*	0.76	28.6	C	0.84	34.0	C
2	Murrieta Boulevard & Portola Avenue	Signal	Mid D	0.71	14.5	B	0.72	21.9	C
3	Livermore Avenue & Portola Avenue	Signal	Mid D	0.78	43.6	D	0.81	41.7	D
4	I-580 WB Ramps & Isabel Avenue	Signal	E	0.50	14.4	B	0.50	9.9	A
5	I-580 EB Ramps & Isabel Avenue	Signal	E	0.43	8.2	A	0.54	6.8	A
6	I-580 WB Ramps & Airway Boulevard	Signal	E	0.71	31.8	C	0.32	5.5	A
7	I-580 EB Ramps & Airway Boulevard	Signal	E	0.55	39.1	D	0.53	24.2	C
8	Isabel Avenue & Jack London Boulevard	Signal	Exempt*	0.80	33.8	C	0.89	45.1	D
9	Airway Boulevard & North Canyons Parkway	Signal	E	**1.16**	**100.9**	**F**	0.61	13.3	B
10	Collier Canyon Road & North Canyons Parkway	Signal	Mid D	0.55	22.3	C	0.48	23.9	C
11	Isabel Avenue & Portola Avenue	Signal	E	0.62	28.3	C	0.53	24.6	C
12	Rutan Drive & E. Airway Boulevard	Signal	Mid D	0.40	2.9 (24.9)	A (C)	0.17	1.8 (16.4)	A (C)
13	BART Access & E. Airway Boulevard	Signal	Mid D	N/A	N/A	N/A	N/A	N/A	N/A
14	Isabel Avenue & BART Parking (North)	Signal	Mid D	N/A	N/A	N/A	N/A	N/A	N/A
15	Portola Avenue & Main Street	Signal	Mid D	N/A	N/A	N/A	N/A	N/A	N/A
16	Sutter Street & E. Airway Boulevard	Stop Control	Mid D	0.36	2.1 (16.8)	A (C)	0.26	1.5 (12.0)	A (B)
17	Portola Avenue & E. Airway Boulevard	Stop	Mid D	0.55	5.6 (25.1)	A (D)	0.70	6.2 (23.2)	A (C)
18	Stealth Street & E. Airway Boulevard	Future	Mid D	N/A	N/A	N/A	N/A	N/A	N/A
19	Isabel Avenue & INP Road	Future	Mid D	N/A	N/A	N/A	N/A	N/A	N/A
20	Portola Avenue & Tranquility Circle	Signal	Mid D	0.56	15.2	B	**0.61**	**46.7**	**D**
21	Portola Avenue & Sandalwood Drive	Stop	Mid D	0.23	0.1 (8.8)	A (A)	0.22	0.1 (10.2)	A (B)
22	Portola Avenue & Montage Drive/Road 3	Future	Mid D	N/A	N/A	N/A	N/A	N/A	N/A
23	Portola Avenue & Road 1	Future	Mid D	N/A	N/A	N/A	N/A	N/A	N/A
24	Portola Avenue & Road 2	Future	Mid D	N/A	N/A	N/A	N/A	N/A	N/A
25	Portola Avenue & Road 4	Future	Mid D	N/A	N/A	N/A	N/A	N/A	N/A
26	Gateway Drive & North Canyons Parkway	Future	Mid D	N/A	N/A	N/A	N/A	N/A	N/A

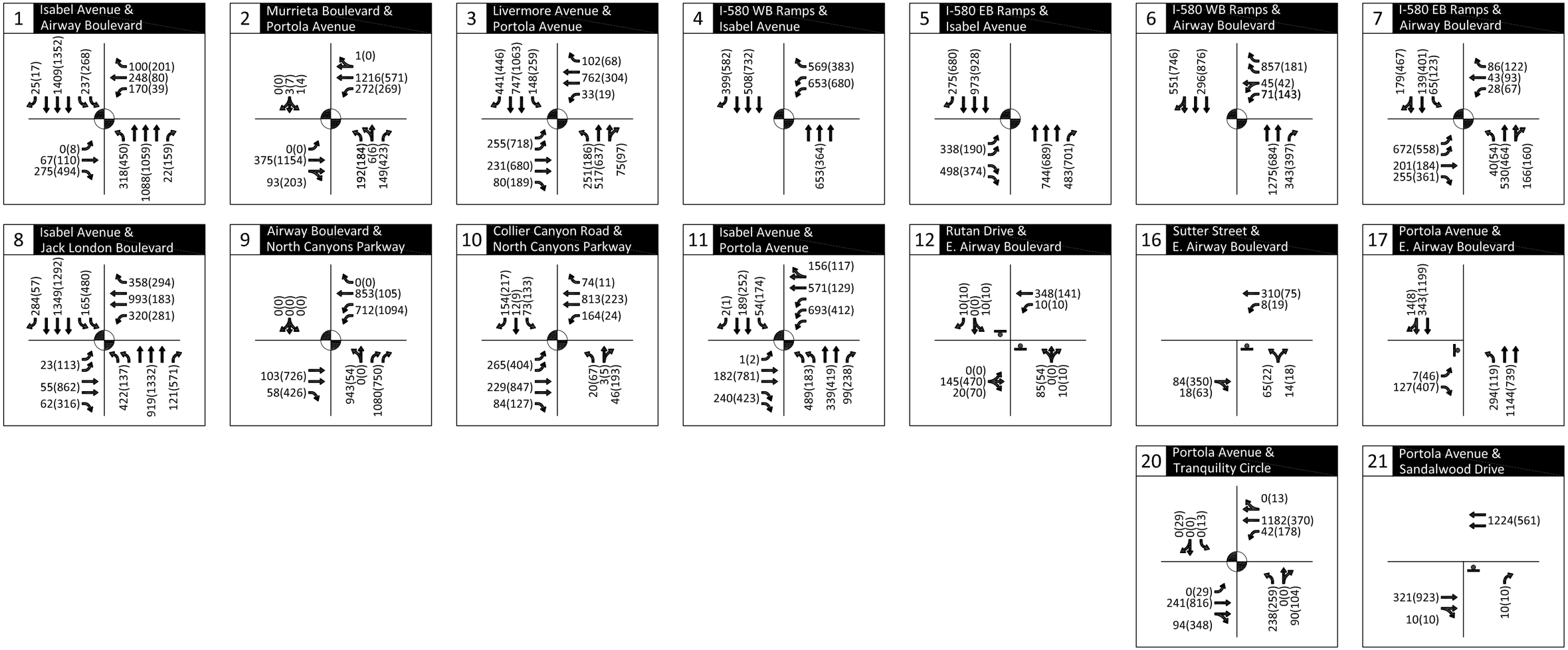
Note: * Exempt per Livermore Policy: Goal CIR-5, Objective CIR-5.1 Policy P4, Circulation Element, Amended 2014

Source: Kittelson & Associates, Inc., 2018.

2040 Cumulative No Project

AM and PM peak hour volumes for 2040 Cumulative No Project Conditions are presented in Figure 3.2-7. In 2040, intersection operations are expected to worsen even further with projected growth in the study area. As presented in Table 3.2-10, under 2040 Cumulative No Project Conditions, regional land use would grow according to ABAG Plan Bay Area Projections, and locally according to the City of Livermore General Plan. Based on that growth, three study intersections would exceed the adopted significance thresholds and operate at unacceptable levels, as follows:

- North Livermore Avenue/Portola Avenue (Intersection #3) would operate at LOS E with an average delay of 55.5 seconds during the PM Peak hour.
- Airway Boulevard/Driveway & North Canyons Parkway (Intersection #9) would operate at LOS F with an average delay of 80.6 seconds during the AM Peak hour.
- Portola Avenue/East Airway Boulevard (Intersection #17) would operate at LOS F with an average delay of 125.4 seconds during the PM Peak hour.



AM(PM) - Traffic Volume

- Stop Sign

- Traffic Signal

2040 Cumulative No Project Traffic Volumes
Weekday AM and PM Peak Hours
Livermore, CA

Figure
3.2-7

KITTELSON & ASSOCIATES

Table 3.2-10 2040 Cumulative No Project Intersection Level of Service

#	*Name*	*Control*	*Standard*	*AM Peak Hour*			*PM Peak Hour*		
				V/C	*Delay*	*LOS*	*V/C*	*Delay*	*LOS*
1	Isabel Avenue & Airway Boulevard	Signal	Exempt	0.86	31.8	C	0.81	59.8	E
2	Murrieta Boulevard & Portola Avenue	Signal	Mid D	0.69	14.2	B	0.84	31.6	C
3	Livermore Avenue & Portola Avenue	Signal	Mid D	0.84	42.3	D	**0.91**	**55.5**	**E**
4	I-580 WB Ramps & Isabel Avenue	Signal	E	0.61	13.7	B	0.52	14.1	B
5	I-580 EB Ramps & Isabel Avenue	Signal	E	0.44	8.8	A	0.56	5.3	A
6	I-580 WB Ramps & Airway Boulevard	Signal	E	0.83	17.1	B	0.46	7.0	A
7	I-580 EB Ramps & Airway Boulevard	Signal	E	0.62	23.2	C	0.61	37.4	D
8	Isabel Avenue & Jack London Boulevard	Signal	Exempt	1.01	53.3	D	1.03	73.6	E
9	Airway Boulevard & North Canyons Parkway	Signal	E	**1.22**	**80.6**	**F**	0.66	24.5	C
10	Collier Canyon Road & North Canyons Parkway	Signal	Mid D	0.52	20.7	C	0.55	22.5	C
11	Isabel Avenue & Portola Avenue	Signal	E	0.64	28.2	C	0.67	33.5	C
12	Rutan Drive & E. Airway Boulevard	Signal	Mid D	N/A	N/A	N/A	N/A	N/A	N/A
13	BART Access & E. Airway Boulevard	Signal	Mid D	0.23	2.8 (15.6)	A (C)	0.20	1.9 (17.9)	A (C)
14	Isabel Avenue & BART Parking (North)	Signal	Mid D	N/A	N/A	N/A	N/A	N/A	N/A
15	Portola Avenue & Main Street	Signal	Mid D	N/A	N/A	N/A	N/A	N/A	N/A
16	Sutter Street & E. Airway Boulevard	Stop Control	Mid D	0.20	2.0 (12.0)	A (B)	0.26	1.2 (12.1)	A (B)
17	Portola Avenue & E. Airway Boulevard	Stop	Mid D	0.37	2.3 (12.3)	A (B)	**1.17**	**23.2 (125.4)**	**C (F)**
18	Stealth Street & E. Airway Boulevard	Future	Mid D	N/A	N/A	N/A	N/A	N/A	N/A
19	Isabel Avenue & INP Road	Future	Mid D	N/A	N/A	N/A	N/A	N/A	N/A
20	Portola Avenue & Tranquility Circle	Signal	Mid D	0.71	26.9	C	0.77	37.5	D
21	Portola Avenue & Sandalwood Drive	Stop	Mid D	0.39	0.1 (9.4)	A (A)	0.39	0.1 (9.2)	A (A)
22	Portola Avenue & Montage Drive/Road 3	Future	Mid D	N/A	N/A	N/A	N/A	N/A	N/A
23	Portola Avenue & Road 1	Future	Mid D	N/A	N/A	N/A	N/A	N/A	N/A
24	Portola Avenue & Road 2	Future	Mid D	N/A	N/A	N/A	N/A	N/A	N/A
25	Portola Avenue & Road 4	Future	Mid D	N/A	N/A	N/A	N/A	N/A	N/A
26	Gateway Drive & North Canyons Parkway	Future	Mid D	N/A	N/A	N/A	N/A	N/A	N/A

Notes:
* Exempt per Livermore Policy: Goal CIR-5, Objective CIR-5.1 Policy P4, Circulation Element, Amended 2014
Bold text indicates intersection operating beyond standard. Shaded cell indicates significant impact.

Source: Kittelson & Associates, Inc., 2018.

2025 Near Term Plus Project

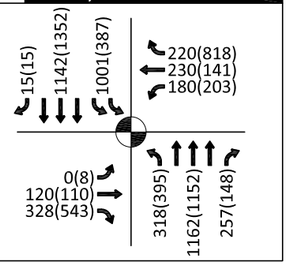
AM and PM peak hour volumes for 2025 Near Term Plus Project Conditions are presented in Figure 3.2-8. Table 3.2-11 and Table 3.2-12 present the 2025 Near Term Plus Project intersection operations for the AM peak hour and PM peak hour, respectively.

Under 2025 Near Term Plus Project Conditions, intersection operations are expected to degrade compared to 2025 No Project Conditions as a result of growth from proposed Plan implementation. The proposed Plan's potentially significant impacts to intersection operations were identified using the criteria previously described. Based on these criteria, the following intersections were found to be operating below the LOS standard under 2025 Near Term Conditions.

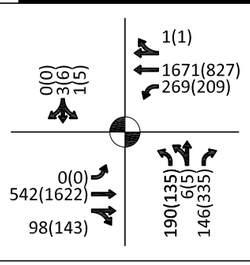
The additional traffic generated by the proposed Plan would result in unacceptable operations at the intersection of North Livermore Avenue & Portola Avenue (#3) during the weekday AM and PM peak hours under 2025 Near Term Conditions.

This intersection serves as one of the main intersections connecting the Isabel Neighborhood to downtown Livermore. The addition of proposed Plan traffic would result in an overall intersection delay of 50.8 seconds per vehicle in the AM peak hour and 70.5 seconds per vehicle in the PM peak hour which are both below the mid-level LOS D standard (45 seconds).

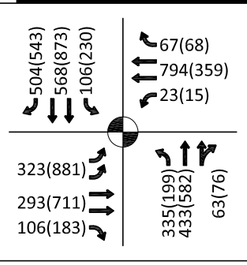
1 Isabel Avenue & Airway Boulevard



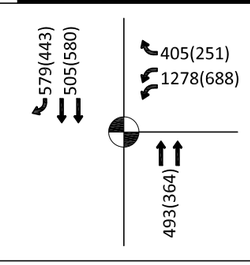
2 Murrieta Boulevard & Portola Avenue



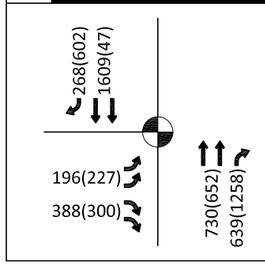
3 Livermore Avenue & Portola Avenue



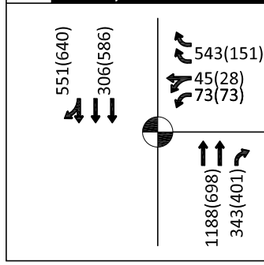
4 I-580 WB Ramps & Isabel Avenue



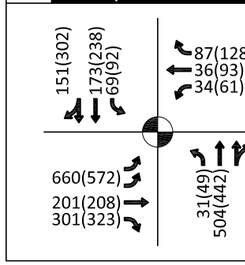
5 I-580 EB Ramps & Isabel Avenue



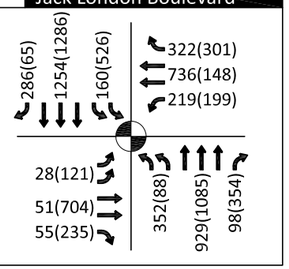
6 I-580 WB Ramps & Airway Boulevard



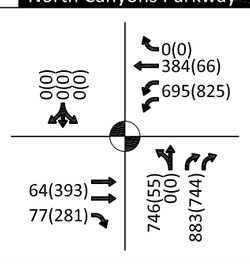
7 I-580 EB Ramps & Airway Boulevard



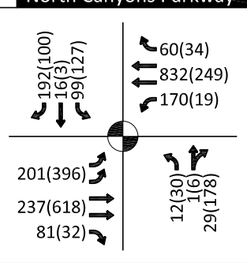
8 Isabel Avenue & Jack London Boulevard



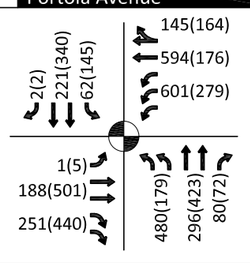
9 Airway Boulevard & North Canyons Parkway



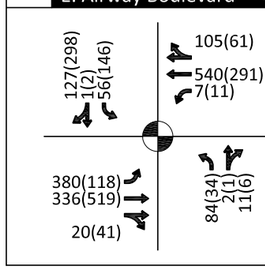
10 Collier Canyon Road & North Canyons Parkway



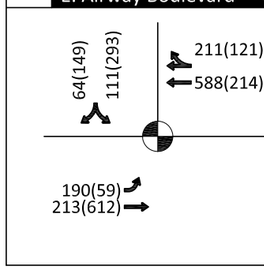
11 Isabel Avenue & Portola Avenue



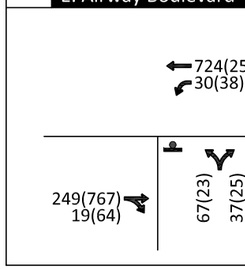
12 Rutan Drive & E. Airway Boulevard



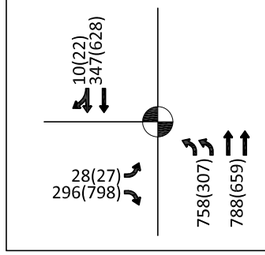
13 BART Access & E. Airway Boulevard



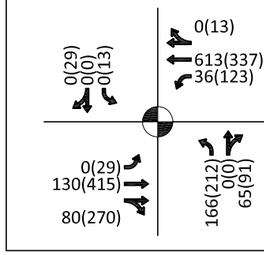
16 Sutter Street & E. Airway Boulevard



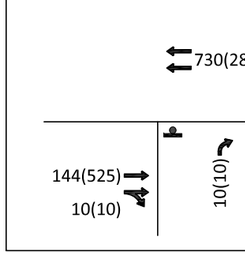
17 Portola Avenue & E. Airway Boulevard



20 Portola Avenue & Tranquility Circle



21 Portola Avenue & Sandalwood Drive



AM(PM) - Traffic Volume

- Stop Sign

- Traffic Signal

2025 Near Term Plus Project Traffic Volumes
Weekday AM and PM Peak Hours
Livermore, CA

Figure
3.2-8

KITTELSON & ASSOCIATES

Table 3.2-11 2025 Near Term Plus Project Intersection Level of Service AM Peak Hour

#	*Name*	*Control*	*Standard*	*2025 Near Term No Project*			*2025 Near Term Plus Project*		
				V/C	*Delay*	*LOS*	*V/C*	*Delay*	*LOS*
1	Isabel Avenue & Airway Boulevard	Signal	Exempt*	0.76	28.6	C	0.97	51.7	D
2	Murrieta Boulevard & Portola Avenue	Signal	Mid D	0.71	14.5	B	0.85	20.5	C
3	Livermore Avenue & Portola Avenue	Signal	Mid D	0.78	43.6	D	**0.87**	**50.8**	**D**
4	I-580 WB Ramps & Isabel Avenue	Signal	E	0.50	14.4	B	0.65	17.1	B
5	I-580 EB Ramps & Isabel Avenue	Signal	E	0.43	8.2	A	0.71	7.8	A
6	I-580 WB Ramps & Airway Boulevard	Signal	E	0.71	31.8	C	0.58	18.4	B
7	I-580 EB Ramps & Airway Boulevard	Signal	E	0.55	39.1	D	0.54	40.5	D
8	Isabel Avenue & Jack London Boulevard	Signal	Exempt*	0.80	33.8	C	0.82	34.5	C
9	Airway Boulevard & North Canyons Parkway	Signal	E	**1.16**	**100.9**	**F**	0.87	53.9	D
10	Collier Canyon Road & North Canyons Parkway	Signal	Mid D	0.55	22.3	C	0.57	24.4	C
11	Isabel Avenue & Portola Avenue	Signal	E	0.62	28.3	C	0.62	28.0	C
12	Rutan Drive & E. Airway Boulevard	Signal	Mid D	0.40	2.9 (24.9)	A (C)	0.61	16.9	B
13	BART Access & E. Airway Boulevard	Signal	Mid D	N/A	N/A	N/A	0.54	17.1	B
14	Isabel Avenue & BART Parking (North)	Signal	Mid D	N/A	N/A	N/A	N/A	N/A	N/A
15	Portola Avenue & Main Street	Signal	Mid D	N/A	N/A	N/A	N/A	N/A	N/A
16	Sutter Street & E. Airway Boulevard	Stop Control	Mid D	0.36	2.1 (16.8)	A (C)	0.46	2.5 (24.9)	A (C)
17	Portola Avenue & E. Airway Boulevard	Stop	Mid D	0.55	5.6 (25.1)	A (D)	0.50	11.0	B
18	Stealth Street & E. Airway Boulevard	Future	Mid D	N/A	N/A	N/A	N/A	N/A	N/A
19	Isabel Avenue & INP Road	Future	Mid D	N/A	N/A	N/A	N/A	N/A	N/A
20	Portola Avenue & Tranquility Circle	Signal	Mid D	0.56	15.2	B	0.46	42.4	D
21	Portola Avenue & Sandalwood Drive	Stop	Mid D	0.23	0.1 (8.8)	A (A)	0.23	0.1 (8.8)	A (A)
22	Portola Avenue & Montage Drive/Road 3	Future	Mid D	N/A	N/A	N/A	N/A	N/A	N/A
23	Portola Avenue & Road 1	Future	Mid D	N/A	N/A	N/A	N/A	N/A	N/A
24	Portola Avenue & Road 2	Future	Mid D	N/A	N/A	N/A	N/A	N/A	N/A
25	Portola Avenue & Road 4	Future	Mid D	N/A	N/A	N/A	N/A	N/A	N/A
26	Gateway Drive & North Canyons Parkway	Future	Mid D	N/A	N/A	N/A	N/A	N/A	N/A

Notes:
* Exempt per Livermore Policy: Goal CIR-5, Objective CIR-5.1 Policy P4, Circulation Element, Amended 2014
Bold text indicates intersection operating beyond standard. Shaded cell indicates significant impact.

Source: Kittelson & Associates, Inc., 2018.

Table 3.2-12 2025 Near Term Plus Project Intersection Level of Service PM Peak Hour

#	*Name*	*Control*	*Standard*	*2025 Near Term No Project*			*2025 Near Term Plus Project*		
				V/C	*Delay*	*LOS*	*V/C*	*Delay*	*LOS*
1	Isabel Avenue & Airway Boulevard	Signal	Exempt*	0.84	34	C	1.13	67.2	E
2	Murrieta Boulevard & Portola Avenue	Signal	Mid D	0.72	21.9	C	0.98	44.2	D
3	Livermore Avenue & Portola Avenue	Signal	Mid D	0.81	41.7	D	**0.99**	**70.5**	**E**
4	I-580 WB Ramps & Isabel Avenue	Signal	E	0.50	9.9	A	0.52	9.8	A
5	I-580 EB Ramps & Isabel Avenue	Signal	E	0.54	6.8	A	0.96	8.9	A
6	I-580 WB Ramps & Airway Boulevard	Signal	E	0.32	5.5	A	0.33	5.1	A
7	I-580 EB Ramps & Airway Boulevard	Signal	E	0.53	24.2	C	0.59	25.8	C
8	Isabel Avenue & Jack London Boulevard	Signal	Exempt*	0.89	45.1	D	0.92	51.7	D
9	Airway Boulevard & North Canyons Parkway	Signal	E	0.61	13.3	B	0.59	12.2	B
10	Collier Canyon Road & North Canyons Parkway	Signal	Mid D	0.48	23.9	C	0.46	25.1	C
11	Isabel Avenue & Portola Avenue	Signal	E	0.53	24.6	C	0.55	25.5	C
12	Rutan Drive & E. Airway Boulevard	Signal	Mid D	0.17	1.8 (16.4)	A (C)	0.36	15.8	B
13	BART Access & E. Airway Boulevard	Signal	Mid D	N/A	N/A	N/A	0.73	20.9	C
14	Isabel Avenue & BART Parking (North)	Signal	Mid D	N/A	N/A	N/A	N/A	N/A	N/A
15	Portola Avenue & Main Street	Signal	Mid D	N/A	N/A	N/A	N/A	N/A	N/A
16	Sutter Street & E. Airway Boulevard	Stop Control	Mid D	0.26	1.5 (12.0)	A (B)	0.53	1.3 (23.5)	A (C)
17	Portola Avenue & E. Airway Boulevard	Stop	Mid D	0.70	6.2 (23.2)	A (C)	0.56	13.4	B
18	Stealth Street & E. Airway Boulevard	Future	Mid D	N/A	N/A	N/A	N/A	N/A	N/A
19	Isabel Avenue & INP Road	Future	Mid D	N/A	N/A	N/A	N/A	N/A	N/A
20	Portola Avenue & Tranquility Circle	Signal	Mid D	0.61	46.7	D	0.54	29.4	C
21	Portola Avenue & Sandalwood Drive	Stop	Mid D	0.22	0.1 (10.2)	A (B)	0.22	0.1 (10.2)	A (B)
22	Portola Avenue & Montage Drive/Road 3	Future	Mid D	N/A	N/A	N/A	N/A	N/A	N/A
23	Portola Avenue & Road 1	Future	Mid D	N/A	N/A	N/A	N/A	N/A	N/A
24	Portola Avenue & Road 2	Future	Mid D	N/A	N/A	N/A	N/A	N/A	N/A
25	Portola Avenue & Road 4	Future	Mid D	N/A	N/A	N/A	N/A	N/A	N/A
26	Gateway Drive & North Canyons Parkway	Future	Mid D	N/A	N/A	N/A	N/A	N/A	N/A

Notes:
* Exempt per Livermore Policy: Goal CIR-5, Objective CIR-5.1 Policy P4, Circulation Element, Amended 2014
Bold text indicates intersection operating beyond standard. Shaded cell indicates significant impact.

Source: Kittelson & Associates, Inc., 2018

2040 Cumulative Plus Project

AM and PM peak hour volumes for 2040 Cumulative Plus Project Conditions are presented in Figure 3.2-9. Under 2040 Cumulative Plus Project Conditions, intersection operations are expected to degrade compared to 2040 Cumulative No Project Conditions because of growth resulting from implementation of the proposed Plan. The proposed Plan's potentially significant impacts to intersection operations were identified using the criteria previously described in this report. Based on these criteria, the following intersections were found to be operating below the LOS standard under Cumulative 2040 Conditions. Intersection operations for weekday AM and PM peak hours are presented in Tables 3.2-13 and 3.2-14, respectively.

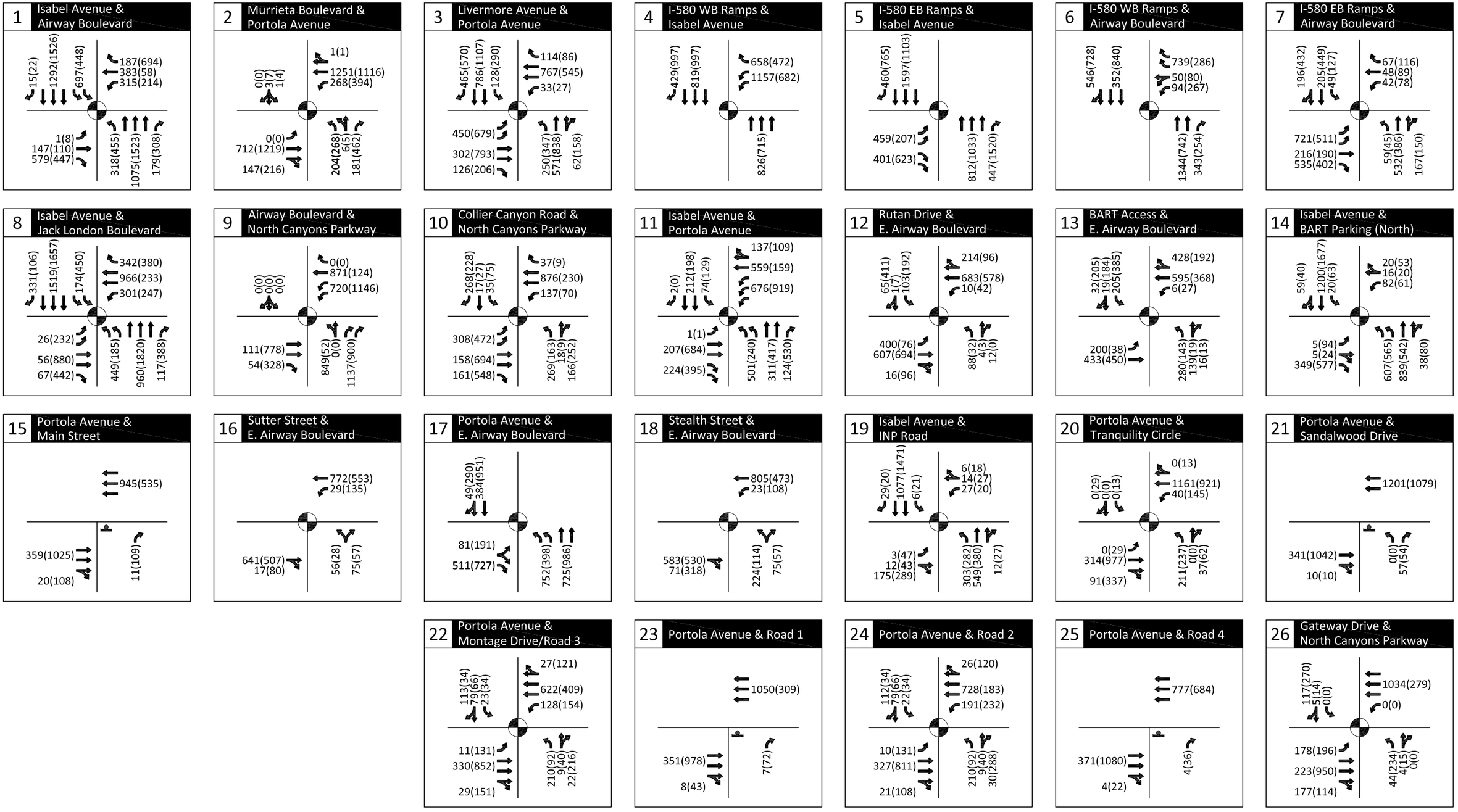
The proposed Plan includes new pedestrian and bicycle connections within the Planning Area. These new connections support the policies in the City of Livermore General Plan that promote multimodal transportation and provide a pedestrian network and biking infrastructure. The proposed Plan also supports and expands upon the improvements identified in the Livermore Bikeways and Trails Master Plan.

The additional traffic generated by the proposed Plan would result in unacceptable operations at the intersection of North Livermore Avenue & Portola Avenue (#3) during the weekday AM peak hour under Cumulative 2040 Conditions. It would also cause the PM peak hour, which is operating below the LOS D standard, to increase by more than five seconds (32.7 seconds).

This intersection serves as one of the main intersections connecting the Isabel Neighborhood to downtown Livermore. The addition of proposed Plan traffic would result in an overall intersection delay of 48.2 seconds per vehicle in the AM peak hour and 88.2 seconds per vehicle in the PM peak hour which are both below the mid-level LOS D standard (45 seconds).

The intersection of Isabel Avenue/Airway Boulevard (Intersection #1) would degrade to LOS E with an average delay of 77.8 seconds during the AM Peak hour, and LOS F with an average delay of 82.3 seconds in the PM peak hour. However, this intersection is designated as exempt from the City of Livermore's LOS standard per the City of Livermore General Plan policy.

The intersection of Isabel Avenue/Jack London Boulevard (Intersection #8) would degrade to LOS F with an average delay of 77.8 seconds during the AM Peak hour, and LOS F with an average delay of 82.2 seconds in the PM peak hour. This exceeds the mid-D threshold of 45 seconds of delay. However, this intersection is designated as exempt from the City of Livermore's LOS standard because it is near a freeway interchange.



AM(PM) - Traffic Volume

- Stop Sign

- Traffic Signal

2040 Cumulative Plus Project Traffic Volumes
Weekday AM and PM Peak Hours
Livermore, CA

Figure 3.2-9

KITTELSON & ASSOCIATES

Table 3.2-13 2040 Cumulative Plus Project Intersection Level of Service AM Peak Hour

#	*Name*	*Control*	*Standard*	*2040 Cumulative No Project*			*2040 Cumulative Plus Project*		
				V/C	*Delay*	*LOS*	*V/C*	*Delay*	*LOS*
1	Isabel Avenue & Airway Boulevard	Signal	Exempt*	0.86	31.8	C	1.15	77.8	E
2	Murrieta Boulevard & Portola Avenue	Signal	Mid D	0.73	13.6	B	0.69	15.2	B
3	Livermore Avenue & Portola Avenue	Signal	Mid D	0.84	42.3	D	**0.90**	**48.2**	**D**
4	I-580 WB Ramps & Isabel Avenue	Signal	E	0.61	13.7	B	0.73	15.2	B
5	I-580 EB Ramps & Isabel Avenue	Signal	E	0.44	8.8	A	0.56	8.0	A
6	I-580 WB Ramps & Airway Boulevard	Signal	E	0.83	17.1	B	0.80	13.5	B
7	I-580 EB Ramps & Airway Boulevard	Signal	E	0.62	23.2	C	0.63	24.4	C
8	Isabel Avenue & Jack London Boulevard	Signal	Exempt*	1.01	53.3	D	1.04	57.4	E
9	Airway Boulevard & North Canyons Parkway	Signal	E	1.22	80.6	F	1.16	60.2	E
10	Collier Canyon Road & North Canyons Parkway	Signal	Mid D	0.52	20.7	C	0.71	33.3	C
11	Isabel Avenue & Portola Avenue	Signal	E	0.64	28.2	C	0.63	28.2	C
12	Rutan Drive & E. Airway Boulevard	Signal	Mid D	0.23	2.8 (15.6)	A (C)	0.71	17.6	B
13	BART Access & E. Airway Boulevard	Signal	Mid D	N/A	N/A	N/A	0.75	24.0	C
14	Isabel Avenue & BART Parking (North)	Signal	Mid D	N/A	N/A	N/A	0.77	34.4	C
15	Portola Avenue & Main Street	Signal	Mid D	N/A	N/A	N/A	0.20	0.1 (8.5)	A (A)
16	Sutter Street & E. Airway Boulevard	Stop Control	Mid D	0.20	2.0 (12.0)	A (B)	0.55	7.4	A
17	Portola Avenue & E. Airway Boulevard	Stop	Mid D	0.37	2.3 (12.3)	A (B)	0.63	14.2	B
18	Stealth Street & E. Airway Boulevard	Future	Mid D	N/A	N/A	N/A	0.72	13.5	B
19	Isabel Avenue & INP Road	Future	Mid D	N/A	N/A	N/A	0.72	27.4	C
20	Portola Avenue & Tranquility Circle	Signal	Mid D	0.71	26.9	C	0.67	21.4	C
21	Portola Avenue & Sandalwood Drive	Stop	Mid D	0.39	0.1 (9.4)	A (A)	0.38	0.3 (9.8)	A (A)
22	Portola Avenue & Montage Drive/Road 3	Future	Mid D	N/A	N/A	N/A	0.55	29.8	C
23	Portola Avenue & Road 1	Future	Mid D	N/A	N/A	N/A	0.22	0.0 (9.1)	A (A)
24	Portola Avenue & Road 2	Future	Mid D	N/A	N/A	N/A	0.57	28.9	C
25	Portola Avenue & Road 4	Future	Mid D	N/A	N/A	N/A	0.17	0.0 (8.6)	A (A)
26	Gateway Drive & North Canyons Parkway	Future	Mid D	N/A	N/A	N/A	0.51	15.5	B

Notes:
* Exempt per Livermore Policy: Goal CIR-5, Objective CIR-5.1 Policy P4, Circulation Element, Amended 2014
Bold text indicates intersection operating beyond standard. Shaded cell indicates significant impact.

Source: Kittelson & Associates, Inc., 2018.

Table 3.2-14 2040 Cumulative Plus Project Intersection Level of Service PM Peak Hour

#	Name	Control	Standard	2040 Cumulative No Project			2040 Cumulative Plus Project		
				V/C	Delay	LOS	V/C	Delay	LOS
1	Isabel Avenue & Airway Boulevard	Signal	Exempt*	0.81	59.8	E	**1.07**	**82.3**	**F**
2	Murrieta Boulevard & Portola Avenue	Signal	Mid D	0.76	25.4	C	0.86	30.9	C
3	Livermore Avenue & Portola Avenue	Signal	Mid D	0.91	55.5	E	**1.06**	**88.2**	**F**
4	I-580 WB Ramps & Isabel Avenue	Signal	E	0.52	14.1	B	0.74	16.2	B
5	I-580 EB Ramps & Isabel Avenue	Signal	E	0.56	5.3	A	1.22	24.3	C
6	I-580 WB Ramps & Airway Boulevard	Signal	E	0.46	7.0	A	0.51	9.4	A
7	I-580 EB Ramps & Airway Boulevard	Signal	E	0.61	37.4	D	0.59	38.0	D
8	Isabel Avenue & Jack London Boulevard	Signal	Exempt*	1.03	73.6	E	**1.12**	**82.2**	**F**
9	Airway Boulevard & North Canyons Parkway	Signal	E	0.66	24.5	C	0.70	24.5	C
10	Collier Canyon Road & North Canyons Parkway	Signal	Mid D	0.55	22.5	C	0.60	26.8	C
11	Isabel Avenue & Portola Avenue	Signal	E	0.67	33.5	C	0.78	45.4	D
12	Rutan Drive & E. Airway Boulevard	Signal	Mid D	0.20	1.9 (17.9)	A (C)	0.50	16.1	B
13	BART Access & E. Airway Boulevard	Signal	Mid D	N/A	N/A	N/A	1.01	42.7	D
14	Isabel Avenue & BART Parking (North)	Signal	Mid D	N/A	N/A	N/A	0.97	52.1	D
15	Portola Avenue & Main Street	Signal	Mid D	N/A	N/A	N/A	0.26	0.6 (9.5)	A (A)
16	Sutter Street & E. Airway Boulevard	Stop Control	Mid D	0.26	1.2 (12.1)	A (B)	0.41	5.0	A
17	Portola Avenue & E. Airway Boulevard	Stop	Mid D	**1.17**	**23.2 (125.4)**	**C (F)**	0.91	29.7	C
18	Stealth Street & E. Airway Boulevard	Future	Mid D	N/A	N/A	N/A	0.67	8.1	A
19	Isabel Avenue & INP Road	Future	Mid D	N/A	N/A	N/A	0.88	52.0	D
20	Portola Avenue & Tranquility Circle	Signal	Mid D	0.80	88.5	F	0.83	54.1	D
21	Portola Avenue & Sandalwood Drive	Stop	Mid D	0.39	0.1 (9.2)	A (A)	0.44	0.2 (9.9)	A (A)
22	Portola Avenue & Montage Drive/Road 3	Future	Mid D	N/A	N/A	N/A	0.55	21.0	C
23	Portola Avenue & Road 1	Future	Mid D	N/A	N/A	N/A	0.25	0.5 (9.0)	A (A)
24	Portola Avenue & Road 2	Future	Mid D	N/A	N/A	N/A	0.57	25.2	C
25	Portola Avenue & Road 4	Future	Mid D	N/A	N/A	N/A	0.28	0.2 (9.1)	A (A)
26	Gateway Drive & North Canyons Parkway	Future	Mid D	N/A	N/A	N/A	0.57	19.1	B

Notes: * Exempt per Livermore Policy: Goal CIR-5, Objective CIR-5.1 Policy P4, Circulation Element, Amended 2014
Bold text indicates intersection operating beyond standard. Shaded cell indicates significant impact.

Source: Kittelson & Associates, Inc., 2018.

Mitigation Measures

At the intersection of North Livermore Avenue and Portola Avenue, adding additional left turn lanes to the impacted intersection under 2025 and 2040 Conditions could address impacts to intersection operations. However, the addition of left turn lanes would require that both roads be widened. Due to roadway right-of-way constraints on North Livermore Avenue and Portola Avenue, the addition of more travel lanes is not feasible. Therefore, no additional improvements would be feasible to address this significant impact, and it remains significant and unavoidable.

Impact 3.2-2 Implementation of the proposed Plan would conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways. (*Significant and Unavoidable)*

Freeway and arterial segments were evaluated according to the Alameda CTC CMP criteria. Results for freeway and arterial segments were extracted from the travel forecasts prepared by the BART team for the BLVX study.

Freeway Segments

Freeway Segment Assumptions

This section summarizes the known completed and planned improvements for I-580 between 2014 and 2025/2040, as follows:

- Construct auxiliary lanes on I-580 eastbound between Isabel Avenue and North Livermore Avenue, and between North Livermore Avenue and First Street (includes widening the Arroyo Las Positas Bridge at two locations and providing additional improvements to accommodate future express lanes)
- Modify the I-580/Vasco Road interchange, including widening the I-580 overcrossing to provide eight lanes (plus bike lanes/shoulders), constructing auxiliary lanes on I-580 between Vasco Road and First Street, and widening Vasco Road to eight lanes between Northfront Road and Las Positas Road
- Reconstruct the I-580/First Street interchange
- Reconstruct the I-580/Greenville Road interchange
- Improve the I-580/San Ramon Road/Foothill Road interchange, including elimination of the eastbound diagonal off-ramp and eastbound loop off-ramp and construction of a new signalized intersection at the off-ramp

The lane configuration for I-580 changes significantly between existing conditions (2014) and 2025 and 2040 Project Conditions. Table 3.2-15 shows the freeway configuration for I-580 for 2014 and 2025/2040.

Table 3.2-15 I-580 Lane Configuration in 2014 and 2025/2040, No Project Conditions

			2014 General Purpose Lanes		*2014 Express Lanes*		*2025 & 2040 General Purpose Lanes*		*2025 & 2040 Express Lanes*	
#	*To*	*From*	*WB*	*EB*	*WB*	*EB*	*WB*	*EB*	*WB*	*EB*
1	Tassajara Road/ Santa Rita Road	Fallon Road/ El Charro Road	5	5	0	1	5	5	1	1
2	Fallon Road/ El Charro Road	Airway Boulevard	4	5	0	1	5	5	1	2
3	Airway Boulevard	Isabel Avenue	4	5	0	1	5	5	1	2
4	Isabel Avenue	Livermore Avenue	4	4	0	1	5	5	1	2
5	Livermore Avenue	Springtown Boulevard/ First Street	4	4	0	1	5	5	1	2
6	Springtown Boulevard/ First Street	Vasco Road	4	5	0	1	5	5	1	2

Notes: EB = eastbound; WB = westbound.

Current and future freeway configuration assumptions were agreed upon by BART and Alameda CTC.

Source: Alameda CTC, BART, and City of Livermore, 2017.

Lastly, express lanes management on I-580 is expected to change by 2040. The express lane currently allows carpool users, defined as two or more people per vehicle, to access the lanes without paying a toll. By 2040, to manage the travel demand on the lanes, only carpoolers with three or more people per vehicle are expected to be allowed to use the lane without paying a toll.

2025 Near Term No Project

Table 3.2-16 and Table 3.2-17 present freeway LOS results for 2025, for general purpose and HOT/express lanes for the AM and PM peak hours, respectively. Most general purpose lane segments in the study area are expected to experience congested conditions, with conditions at LOS E or F in at least one direction in one peak period. In general, the westbound direction sees heavier volumes in the AM than in the PM.

Table 3.2-16 I-580 Performance in AM, 2025 Near Term No Project Conditions

			General Purpose, Westbound		*General Purpose, Eastbound*		*Express Lane, Westbound*		*Express Lane, Eastbound*	
#	*To*	*From*	*LOS*	*V/C*	*LOS*	*V/C*	*LOS*	*V/C*	*LOS*	*V/C*
1	Tassajara Road/ Santa Rita Road	Fallon Road/ El Charro Road	**F**	**1.00**	B	0.57	**F**	**1.02**	A	0.29
2	Fallon Road/ El Charro Road	Airway Boulevard	E	0.97	B	0.55	E	0.99	A	0.15
3	Airway Boulevard	Isabel Avenue	**F**	**1.04**	B	0.49	**F**	**1.04**	A	0.15
4	Isabel Avenue	Livermore Avenue	**F**	**1.05**	B	0.54	**F**	**1.06**	A	0.15
5	Livermore Avenue	Springtown Boulevard/First Street	E	0.98	B	0.52	E	0.99	A	0.15
6	Springtown Boulevard/First Street	Vasco Road	E	0.98	B	0.57	E	0.98	A	0.15

Notes: N/A = not applicable; LOS = level of service; V/C = volume-to-capacity ratio.

Bold/gray shading indicates segments that operate at unacceptable levels.

Source: BLVX DEIR, 2017.

Table 3.2-17 I-580 Performance in PM, 2025 Near Term No Project Conditions

			General-Purpose Westbound		*General-Purpose Eastbound*		*Express Lane Westbound*		*Express Lane Eastbound*	
#	*To*	*From*	*LOS*	*V/C*	*LOS*	*V/C*	*LOS*	*V/C*	*LOS*	*V/C*
1	Tassajara Road/Santa Rita Road	Fallon Road/ El Charro Road	C	0.66	E	0.95	B	0.47	D	0.85
2	Fallon Road/ El Charro Road	Airway Boulevard	C	0.62	E	0.97	B	0.47	B	0.44
3	Airway Boulevard	Isabel Avenue	B	0.55	E	0.95	B	0.43	B	0.40
4	Isabel Avenue	Livermore Avenue	C	0.64	**F**	**1.04**	B	0.42	B	0.40
5	Livermore Avenue	Springtown Boulevard/ First Street	B	0.51	E	0.92	B	0.37	B	0.40
6	Springtown Boulevard/ First Street	Vasco Road	C	0.59	D	0.90	B	0.36	B	0.36

Notes: N/A = not applicable; LOS = level of service; V/C = volume-to-capacity ratio.

Bold/gray shading indicates segments that operate at unacceptable levels.

Source: BLVX DEIR, 2017.

2040 Cumulative No Project

Table 3.2-18 and Table 3.2-19 show freeway LOS results under 2040 No Project Conditions for the AM peak hour and PM peak hour, respectively. The general purpose lanes are expected to experience greater volumes, with most segments in the peak travel direction in the study area showing LOS E or F. The trends remain unchanged from 2025, with westbound lanes seeing the greatest volumes in the AM peak period and eastbound lanes seeing the greatest volumes in the PM peak period. The HOT/express lanes improve notably from 2025 to 2040, the result of a change in the tolling policy.

Table 3.2-18 I-580 Performance in AM, 2040 No Project Conditions

			General-Purpose Westbound		*General-Purpose Eastbound*		*Express Lane Westbound*		*Express Lane Eastbound*	
#	*To*	*From*	*LOS*	*V/C*	*LOS*	*V/C*	*LOS*	*V/C*	*LOS*	*V/C*
1	Tassajara Road/ Santa Rita Road	Fallon Road/ El Charro Road	**F**	**1.02**	C	0.67	B	0.45	A	0.20
2	Fallon Road/ El Charro Road	Airway Boulevard	E	0.99	C	0.65	B	0.44	A	0.10
3	Airway Boulevard	Isabel Avenue	**F**	**1.06**	C	0.59	B	0.40	A	0.10
4	Isabel Avenue	Livermore Avenue	**F**	**1.10**	C	0.63	B	0.40	A	0.10
5	Livermore Avenue	Springtown Boulevard/ First Street	**F**	**1.03**	C	0.63	B	0.38	A	0.10
6	Springtown Boulevard/First Street	Vasco Road	**F**	**1.04**	D	0.77	A	0.35	A	0.10

Notes: N/A = not applicable; LOS = level of service; V/C = volume-to-capacity ratio.

Bold/gray shading indicates segments that operate at unacceptable levels.

Source: BLVX DEIR, 2017.

Table 3.2-19 I-580 Performance in PM, 2040 No Project Conditions

			General-Purpose Westbound		*General-Purpose Eastbound*		*Express Lane Westbound*		*Express Lane Eastbound*	
#	*To*	*From*	*LOS*	*V/C*	*LOS*	*V/C*	*LOS*	*V/C*	*LOS*	*V/C*
1	Tassajara Road/Santa Rita Road	Fallon Road/ El Charro Road	D	0.78	E	0.98	A	0.22	A	0.24
2	Fallon Road/ El Charro Road	Airway Boulevard	D	0.75	E	0.97	A	0.22	A	0.13
3	Airway Boulevard	Isabel Avenue	C	0.66	E	0.99	A	0.20	A	0.12
4	Isabel Avenue	Livermore Avenue	D	0.77	**F**	**1.08**	A	0.20	A	0.13
5	Livermore Avenue	Springtown Boulevard/ First Street	C	0.74	**F**	**1.01**	A	0.18	A	0.12
6	Springtown Boulevard/ First Street	Vasco Road	D	0.83	**F**	**1.02**	A	0.17	A	0.11

Notes: N/A = not applicable; LOS = level of service; V/C = volume-to-capacity ratio.

Bold/gray shading indicates segments that operate at unacceptable levels.

Source: BLVX DEIR, 2017.

Freeway General Purpose Lane Segments

2025 Near Term Plus Project

With the implementation of the proposed Plan in 2025, regional traffic volumes will increase from traffic volumes under the No Project Alternative. In the peak periods, some corridors are expected to experience notable increases in traffic volumes while decreases are expected with other corridors. While the addition of the BART extension relieves some corridors, the increase in land uses associated with the proposed Plan increases traffic levels. Tables 3.2-20 and 3.2-21 show the general change in traffic patterns for the 2025 Near Term proposed Plan compared with No Project Conditions for the AM and PM peak hours, respectively.

For the proposed Plan under 2025 Near Term Conditions, no general purpose freeway segments would have a significant impact compared to No Project Conditions. Therefore, this impact would be less than significant.

Table 3.2-20 I-580 General Purpose Freeway Level of Service, 2025 Near Term Conditions, AM Peak Hour

			Westbound				*Eastbound*			
			No Project Alternative		*INP Project*		*No Project Alternative*		*INP Project*	
#	*To*	*From*	*LOS*	*V/C*	*LOS*	*V/C*	*LOS*	*V/C*	*LOS*	*V/C*
1	Tassajara Road/Santa Rita Road	Fallon Road/ El Charro Road	**F**	**1.004**	**F**	**1.006**	B	0.567	B	0.557
2	Fallon Road/ El Charro Road	Airway Boulevard	E	0.975	E	0.969	B	0.547	B	0.537
3	Airway Boulevard	Isabel Avenue	**F**	**1.037**	E	0.997	B	0.488	B	0.459
4	Isabel Avenue	Livermore Avenue	**F**	**1.051**	**F**	**1.035**	B	0.537	B	0.545
5	Livermore Avenue	Springtown Boulevard/ First Street	E	0.984	E	0.975	B	0.519	B	0.544
6	Springtown Boulevard/ First Street	Vasco Road	E	0.978	E	0.980	B	0.567	C	0.602

Notes: LOS = level of service; V/C = volume-to-capacity ratio.

Bold indicates segment operating beyond the standard.

Source: BLVX DEIR, 2017.

Table 3.2-21 I-580 General Purpose Freeway Level of Service, 2025 Near Term Conditions, PM Peak Hour

			Westbound				*Eastbound*			
			No Project Alternative		*INP Project*		*No Project Alternative*		*INP Project*	
#	*To*	*From*	*LOS*	*V/C*	*LOS*	*V/C*	*LOS*	*V/C*	*LOS*	*V/C*
1	Tassajara Road/Santa Rita Road	Fallon Road/ El Charro Road	C	0.659	C	0.645	E	0.954	E	0.939
2	Fallon Road/ El Charro Road	Airway Boulevard	C	0.623	C	0.609	E	0.970	E	0.946
3	Airway Boulevard	Isabel Avenue	B	0.545	B	0.525	E	0.953	E	0.933
4	Isabel Avenue	Livermore Avenue	C	0.636	C	0.622	**F**	**1.037**	**F**	**1.042**
5	Livermore Avenue	Springtown Boulevard/ First Street	B	0.513	B	0.525	E	0.922	E	0.941
6	Springtown Boulevard/ First Street	Vasco Road	C	0.586	C	0.603	E	0.903	E	0.922

Notes: LOS = level of service; V/C = volume-to-capacity ratio.

Bold indicates segment operates beyond the standard.

Source: BLVX DEIR, 2017.

2040 Cumulative Plus Project

Similar to 2025, the addition of the BART extension to Isabel Avenue and the buildout of the proposed Plan would contribute to changes in traffic compared to the No Project Condition. In 2040, traffic levels would reduce east of the Dublin/Pleasanton Station as commuters drive to and park, drop off, or pick up BART passengers at the proposed station near Isabel Avenue. The shifting of vehicles from the Dublin/Pleasanton Station to the Isabel Station would cause small volume reductions on I-580 and parallel roadways west of Isabel Avenue, between Isabel Avenue and Hacienda Drive. The shifting from auto travel to transit would also cause small volume reductions on I-580 and parallel roadways west of Isabel. However, east of Isabel Avenue, a small increase of vehicles on I-580 and local Livermore roadways would result from travelers driving to the Isabel Station and to the built out Planning Area.

The proposed Plan in 2040 would slightly reduce vehicle volumes on I-580 between Isabel Avenue and Hacienda Drive. East of Isabel Avenue, a small increase of vehicles on I-580 would result from travelers drawn to BART at the new Isabel Station and to the Isabel Neighborhood. Additionally, the proposed Plan buildout would result in more vehicles on I-580 both east and west of Isabel Avenue. Table 3.2-22 and Table 3.2-23 show the general change in traffic patterns for the 2040

Cumulative proposed Plan compared with No Project Conditions for the AM and PM peak hours, respectively.

Table 3.2-22 I-580 General Purpose Freeway Level of Service, 2040 Cumulative Conditions, AM Peak Hour

			Westbound				*Eastbound*			
			No Project Alternative		*INP Project*		*No Project Alternative*		*INP Project*	
#	*To*	*From*	*LOS*	*V/C*	*LOS*	*V/C*	*LOS*	*V/C*	*LOS*	*V/C*
1	Tassajara Road/Santa Rita Road	Fallon Road/ El Charro Road	F	1.020	F	1.011	C	0.668	C	0.684
2	Fallon Road/ El Charro Road	Airway Boulevard	E	0.995	E	0.967	C	0.653	C	0.680
3	Airway Boulevard	Isabel Avenue	F	1.064	F	1.027	C	0.588	B	0.565
4	Isabel Avenue	Livermore Avenue	F	1.103	**F**	**1.166**	C	0.633	C	0.617
5	Livermore Avenue	Springtown Boulevard/ First Street	F	1.026	**F**	**1.086**	C	0.628	C	0.644
6	Springtown Boulevard/ First Street	Vasco Road	F	1.037	**F**	**1.092**	D	0.766	D	0.779

Notes: LOS = level of service; V/C = volume-to-capacity ratio.

Bold indicates segment operates beyond the standard.

Shaded cell indicates significant impact.

Source: BLVX DEIR, 2017.

Table 3.2-23 I-580 General Purpose Freeway Level of Service, 2040 Cumulative Conditions, PM Peak Hour

			Westbound				*Eastbound*			
			No Project Alternative		*INP Project*		*No Project Alternative*		*INP Project*	
#	*To*	*From*	*LOS*	*V/C*	*LOS*	*V/C*	*LOS*	*V/C*	*LOS*	*V/C*
1	Tassajara Road/Santa Rita Road	Fallon Road/ El Charro Road	D	0.780	D	0.796	E	0.976	E	0.976
2	Fallon Road/ El Charro Road	Airway Boulevard	D	0.754	D	0.777	E	0.970	E	0.974
3	Airway Boulevard	Isabel Avenue	C	0.664	C	0.683	E	0.992	E	0.995
4	Isabel Avenue	Livermore Avenue	D	0.771	D	0.763	F	1.083	**F**	**1.145**
5	Livermore Avenue	Springtown Boulevard/ First Street	C	0.738	C	0.719	F	1.013	**F**	**1.057**
6	Springtown Boulevard/ First Street	Vasco Road	D	0.826	D	0.837	F	1.016	**F**	**1.060**

Notes: LOS = level of service; V/C = volume-to-capacity ratio.

Bold indicates segment operates beyond the standard.

Shaded cell indicates significant impact.

Source: BLVX DEIR, 2017.

For the proposed Plan under 2040 Cumulative Conditions, three general purpose freeway segments would have a significant impact compared to No Project Conditions. Impacts would occur at the following segments:

- North Livermore Avenue to Isabel Avenue General Purpose (Segment #4). This segment would operate at a V/C ratio of 1.166 and LOS F during the AM peak hour in the westbound direction and a V/C ratio of 1.145 and LOS F during the PM peak hour in the eastbound direction.
- Springtown Boulevard/ First Street to North Livermore Avenue (Segment #5). This segment would operate at a V/C ratio of 1.086 and LOS F during the AM peak hour in the westbound direction and a V/C ratio of 1.057 and LOS F during the PM peak hour in the eastbound direction.
- Vasco Road to Springtown Boulevard/ First Street (Segment #6). This segment would operate at a V/C ratio of 1.092 and LOS F during the AM peak hour in the westbound direction and a V/C ratio of 1.060 and LOS F during the PM peak hour in the eastbound direction.

Freeway Express Lane Segments

2025 Near Term Plus Project

Tables 3.2-24 and 3.2-25 summarize the freeway results for the express lane for 2025 Near Term Conditions for the AM and PM peak hours, respectively.

For the proposed Plan under 2025 Near Term Conditions, three express lane freeway segments would operate at unacceptable levels during one of the peak periods. However, these segments would operate no worse than under the No Project Conditions. Therefore, the proposed Plan would have no impacts related HOV/express lane segments under 2025 Near Term Conditions, and no mitigation measures are required.

Table 3.2-24 I-580 HOV/Express Lane Freeway Level of Service, 2025 Near Term Conditions, AM Peak Hour

			Westbound				*Eastbound*			
			No Project Alternative		*INP Project*		*No Project Alternative*		*INP Project*	
#	*To*	*From*	*LOS*	*V/C*	*LOS*	*V/C*	*LOS*	*V/C*	*LOS*	*V/C*
1	Tassajara Road/Santa Rita Road	Fallon Road/ El Charro Road	**F**	**1.024**	**F**	**1.011**	A	0.293	A	0.204
2	Fallon Road/ El Charro Road	Airway Boulevard	E	0.990	E	0.974	A	0.147	A	0.102
3	Airway Boulevard	Isabel Avenue	**F**	**1.044**	E	0.994	A	0.147	A	0.102
4	Isabel Avenue	Livermore Avenue	**F**	**1.055**	**F**	**1.045**	A	0.147	A	0.103
5	Livermore Avenue	Springtown Boulevard/ First Street	E	0.994	E	0.993	A	0.147	A	0.103
6	Springtown Boulevard/ First Street	Vasco Road	E	0.981	E	0.991	A	0.146	A	0.102

Notes: LOS = level of service; V/C = volume-to-capacity ratio.

Bold indicates segment operates beyond the standard.

Source: BLVX DEIR, 2017.

Table 3.2-25 I-580 HOV/Express Lane Freeway Level of Service, 2025 Near Term Conditions, PM Peak Hour

			Westbound				*Eastbound*			
			No Project Alternative		*INP Project*		*No Project Alternative*		*INP Project*	
#	*To*	*From*	*LOS*	*V/C*	*LOS*	*V/C*	*LOS*	*V/C*	*LOS*	*V/C*
1	Tassajara Road/Santa Rita Road	Fallon Road/ El Charro Road	B	0.474	B	0.450	D	0.846	D	0.805
2	Fallon Road/ El Charro Road	Airway Boulevard	B	0.473	B	0.449	B	0.442	B	0.417
3	Airway Boulevard	Isabel Avenue	B	0.426	B	0.414	B	0.398	B	0.376
4	Isabel Avenue	Livermore Avenue	B	0.421	B	0.411	B	0.433	B	0.411
5	Livermore Avenue	Springtown Boulevard/ First Street	B	0.366	B	0.362	B	0.402	B	0.377
6	Springtown Boulevard/ First Street	Vasco Road	B	0.356	B	0.353	B	0.364	A	0.342

Notes: LOS = level of service; V/C = volume-to-capacity ratio.

Bold indicates segment operates beyond the standard.

Source: BLVX DEIR, 2017.

2040 Cumulative Plus Project

Tables 3.2-26 and 3.2-27 summarize the freeway results for the express lane for 2040 Cumulative Conditions for the AM and PM peak hours, respectively.

Under 2040 Cumulative Conditions, the HOV policy is expected to be three persons per vehicle, rather than the current two persons per vehicle. The analysis showed that, under this policy, fewer vehicles would qualify to use the HOV/express lanes, causing them to operate at an improved LOS in 2040 compared with 2025.

Under the proposed Plan, all HOV/express lane freeway segments would operate at acceptable levels in the 2040 cumulative analysis. Therefore, there would be no impact.

Table 3.2-26 I-580 HOV/Express Lane Freeway Level of Service, 2040 Cumulative Conditions, AM Peak Hour

			Westbound				*Eastbound*			
			No Project Alternative		*INP Project*		*No Project Alternative*		*INP Project*	
#	*To*	*From*	*LOS*	*V/C*	*LOS*	*V/C*	*LOS*	*V/C*	*LOS*	*V/C*
1	Tassajara Road/Santa Rita Road	Fallon Road/ El Charro Road	B	0.446	B	0.425	A	0.198	A	0.203
2	Fallon Road/ El Charro Road	Airway Boulevard	B	0.435	B	0.416	A	0.105	A	0.107
3	Airway Boulevard	Isabel Avenue	B	0.399	B	0.386	A	0.102	A	0.099
4	Isabel Avenue	Livermore Avenue	B	0.396	B	0.383	A	0.098	A	0.097
5	Livermore Avenue	Springtown Boulevard/ First Street	B	0.378	B	0.365	A	0.098	A	0.097
6	Springtown Boulevard/ First Street	Vasco Road	A	0.349	A	0.335	A	0.096	A	0.095

Note: LOS = level of service; V/C = volume-to-capacity ratio.

Bold indicates segment operates beyond the standard.

Source: BLVX DEIR, 2017.

Table 3.2-27 I-580 HOV/Express Lane Freeway Level of Service, 2040 Cumulative Conditions, PM Peak Hour

			Westbound				*Eastbound*			
			No Project Alternative		*INP Project*		*No Project Alternative*		*INP Project*	
#	*To*	*From*	*LOS*	*V/C*	*LOS*	*V/C*	*LOS*	*V/C*	*LOS*	*V/C*
1	Tassajara Road/Santa Rita Road	Fallon Road/ El Charro Road	A	0.222	A	0.229	A	0.239	A	0.234
2	Fallon Road/ El Charro Road	Airway Boulevard	A	0.216	A	0.223	A	0.129	A	0.128
3	Airway Boulevard	Isabel Avenue	A	0.202	A	0.205	A	0.124	A	0.124
4	Isabel Avenue	Livermore Avenue	A	0.199	A	0.196	A	0.128	A	0.135
5	Livermore Avenue	Springtown Boulevard/ First Street	A	0.181	A	0.179	A	0.119	A	0.123
6	Springtown Boulevard/ First Street	Vasco Road	A	0.174	A	0.173	A	0.109	A	0.111

Note: LOS = level of service; V/C = volume-to-capacity ratio.

Bold indicates segment operates beyond the standard.

Source: BLVX DEIR, 2017.

Arterial Segments

Arterial segment forecasts were extracted from the modified version of Alameda CTC's County-wide Travel Demand Model to generate future-year peak-hour volumes. These volumes are used to calculate V/C ratios and determine impacts. The analysis relied on the Highway Capacity Manual 2010 (HCM) arterial capacity methodology for determining level of service.

2025 Near Term Conditions

Table 3.2-28 presents segment operations for 2025 Near Term Conditions. For the proposed Plan under 2025 Near Term Plus Project Conditions, there are two segments in the AM peak hour and two segments in the PM peak hour that operate at LOS F, but based on the established significance threshold, no CMP arterials segments would have a significant impact compared to No Project Conditions. Therefore, impacts to CMP arterial segments in 2025 are less than significant.

Table 3.2-28 2025 Near Term Arterial CMP Segments

Segment		*2025 Near Term No Project*		*2025 Near Term Plus Project*	
		AM	*PM*	*AM*	*PM*
Northbound/Eastbound					
N. Livermore Ave - North of Portola Ave	Volume	897	1,498	964	1,559
	LOS	C	D	D	E
	V/C change			0.07	0.04
Airway Blvd - West of Isabel Ave	Volume	135	**983**	321	**989**
	LOS	C	**F**	C	**F**
	V/C change			1.38	**0.01**
Airway Blvd - East of Isabel Ave	Volume	126	387	484	**384**
	LOS	C	D	D	D
	V/C change			2.84	-0.01
Stanley Blvd - West of Isabel Ave	Volume	310	**2,074**	311	**2,064**
	LOS	C	**F**	C	**F**
	V/C change			0.00	**-0.01**
Isabel Ave - South of Stanley Blvd	Volume	1,536	1,073	1,479	989
	LOS	D	D	D	D
	V/C change			-0.04	-0.08
Southbound/Westbound					
N. Livermore Ave - North of Portola Ave	Volume	486	**1,727**	552	**1,790**
	LOS	C	**F**	C	**F**
	V/C change			0.14	**0.04**
Airway Blvd - West of Isabel Ave	Volume	759	545	764	680
	LOS	E	D	E	D
	V/C change			0.01	0.25
Airway Blvd - East of Isabel Ave	Volume	367	249	534	512
	LOS	C	C	D	D
	V/C change			0.46	1.06
Stanley Blvd - West of Isabel Ave	Volume	**2,066**	518	**2,079**	525
	LOS	**F**	D	**F**	D
	V/C change			**0.01**	0.01
Isabel Ave - South of Stanley Blvd	Volume	665	1,618	638	1,600
	LOS	C	D	C	D
	V/C change			-0.04	-0.01

Note: **Bold** indicates operating beyond standard of LOS E.

Source: Kittelson & Associates, Inc., 2018.

2040 Cumulative Conditions

Table 3.2-29 presents segment operations for 2040 Cumulative Conditions. For the proposed Plan under 2040 Cumulative Conditions, there are four segments in the AM peak hour and four segments in the PM peak hour that would operate at LOS F, but only two CMP arterial segments would have a significant impact compared to No Project Conditions. Impacts would occur at the following segments:

- Airway Boulevard, West of Isabel Avenue. This segment would operate at a LOS F during the AM and PM peak hour in the southbound and northbound directions and a V/C ratio increase over the No Project Condition of > 0.05. Based on the significance criteria for the CMP, this represents a **significant impact**.
- Isabel Avenue South of Stanley Boulevard. This segment would operate at a LOS F during the PM peak hour in the southbound direction and a V/C ratio increase over the No Project Condition of > 0.05. Based on the significance criteria for the CMP, this represents a **significant impact**.

Table 3.2-29 2040 Cumulative Arterial CMP Segments

Segment		*2040 Cumulative No Project*		*2040 Cumulative Plus Project*	
		AM	*PM*	*AM*	*PM*
Northbound/Eastbound					
N. Livermore Ave - North of Portola Ave	Volume	1,125	**2,069**	1,215	**2,059**
	LOS	C	**F**	D	**F**
	V/C change			0.08	**-0.01**
Airway Blvd - West of Isabel Ave	Volume	234	**985**	658	**1,027**
	LOS	C	**F**	C	**F**
	V/C change			1.81	**0.04**
Airway Blvd - East of Isabel Ave	Volume	131	487	627	789
	LOS	C	D	D	E
	V/C change			0.26	-0.13
Stanley Blvd - West of Isabel Ave	Volume	279	**2,838**	286	**2,786**
	LOS	C	**F**	C	**F**
	V/C change			0.03	**-0.02**
Isabel Ave - South of Stanley Blvd	Volume	**2,344**	**1,794**	**2,474**	1,689
	LOS	**F**	**F**	**F**	E
	V/C change			**0.06**	-0.06
Southbound/Westbound					
N. Livermore Ave - North of Portola Ave	Volume	934	2,028	993	2,166
	LOS	C	E	C	E
	V/C change			0.06	0.07
Airway Blvd - West of Isabel Ave	Volume	**880**	709	**932**	**851**
	LOS	**F**	D	**F**	**F**
	V/C change			**0.06**	**0.20**
Airway Blvd - East of Isabel Ave	Volume	328	268	581	767
	LOS	C	C	D	E
	V/C change			-0.05	0.16
Stanley Blvd - West of Isabel Ave	Volume	**2,824**	509	**2,920**	563
	LOS	**F**	D	**F**	D
	V/C change			0.03	0.11
Isabel Ave - South of Stanley Blvd	Volume	1,124	**2,629**	1,091	**2,799**
	LOS	D	**F**	D	**F**
	V/C change			-0.03	**0.06**

Note: **Bold** indicates operating beyond standard of LOS E.

Shaded cell indicates significant impact.

Source: Kittelson & Associates, Inc., 2018.

Mitigation Measures

Freeway Segments

Typical mitigation measures that would address significant impacts to general purpose freeway segments entail operational improvements to the freeway, such as adding or modifying ramp metering, adding express lanes, and constructing other capacity enhancements such as additional travel lanes. However, the transportation analysis already accounts for these types of planned and programed operational improvements along the study area segments of I-580, as described in the Freeway Segment Assumptions subsection above.

No additional improvements would be feasible to address this significant impact. Specifically, while adding travel lanes to I-580 would increase the capacity of the freeway and reduce this impact, physical constraints and the existing ROW along the affected freeway segment make this infeasible. For example, widening I-580 would conflict with bridge columns at some locations and would impact homes, businesses, and/or an existing park (Northfront Park). Furthermore, adding travel lanes can lead to additional social and environmental impacts such as induced travel demand (e.g., increased passenger vehicles on the roadway because of greater freeway capacity). The additional passenger vehicles would have adverse environmental impacts, including degradation of air quality, increased noise from vehicles, and reductions in transit use, as less congestion or reduced driving time may make driving more attractive than transit. Therefore, the impact remains significant and unavoidable.

Arterial Segments

Typical mitigation measures that would address significant impacts to arterial segments entail widening or operational improvements to the arterials. However, the transportation analysis already accounts for these types of planned and programed operational improvements along the study area segments, as described in the Freeway Segment Assumptions subsection above.

No additional improvements would be feasible to address this significant impact. Specifically, while adding travel lanes to arterial segments would increase the capacity of the roadways and reduce this impact, physical constraints and the existing ROW along the affected arterial segment make this infeasible. Furthermore, adding travel lanes can lead to additional social and environmental impacts such as induced travel demand (e.g., increased passenger vehicles on the roadway because of greater freeway capacity). The additional passenger vehicles would have adverse environmental impacts, including degradation of air quality, increased noise from vehicles, and reductions in transit use, as less congestion or reduced driving time may make driving more attractive than transit. Therefore, the impact remains significant and unavoidable.

Impact 3.2-3 Implementation of the proposed Plan would not result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks. (*No Impact*)

The Livermore Municipal Airport is located just southwest of the Planning Area. As such, the proposed Plan has the potential to create land uses that may not be compatible with the airport use (see Section 3.1: Land Use, Population, and Housing; Section 3.6: Noise and Vibration; and Section 3.8: Hazards and Hazardous Materials). However, given the nature of the proposed Plan and the nature of services provided at the Livermore Municipal Airport, the proposed Plan is not expected to result in any changes to air traffic patterns or safety. Therefore, there is no impact.

Mitigation Measures

None required.

Impact 3.2-4 Implementation of the proposed Plan would not substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment). (*Less than Significant*)

Implementation of the proposed Plan would increase traffic levels in the study area and introduce new intersections and traffic signals to the existing street system. However, these new roadways and traffic signals would be designed to City Design standards and therefore should not substantially increase hazards due to a design feature. Therefore, impacts would be less than significant.

Mitigation Measures

None required.

Impact 3.2-5 Implementation of the proposed Plan would not result in inadequate emergency access. (*Less than Significant*)

Implementation of the proposed Plan would increase land uses in the Planning Area. New land uses will require additional emergency access to respond to emergencies. However, these new roadways and intersections will be designed to City design standards that account for emergency access and therefore should not result in inadequate emergency access. Therefore, impacts would be less than significant.

Mitigation Measures

None required.

Impact 3.2-6 Implementation of the proposed Plan would not conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities. (*No Impact*)

The proposed Plan includes new pedestrian and bicycle connections within the Planning Area, supporting and expanding upon the improvements identified in the Livermore Bikeways and Trails Master Plan. The transit-oriented development pattern creates a diverse mix of land uses, resulting in a concentration of housing, jobs, and shopping all within walking and bicycling distance of one another. The Plan emphasizes multimodal circulation, accommodating vehicular through traffic but at a slow pace that substantially improves safety for pedestrians and cyclists compared to traditional higher-speed roadway systems. Pedestrian and bicycle activity is likely to increase proportionately to increases in traffic volumes in the Planning Area. Primary pedestrian street crossings on major streets would occur at signals, which include specific provisions to minimize conflicts between vehicular traffic and non-motorized transportation users. The proposed Plan's would benefit pedestrian and bicycle circulation in the Planning, so there would be no impact.

Mitigation Measures

None required.

This page intentionally left blank.