

## **B. TRANSPORTATION**

### **1. Introduction**

This section describes the transportation setting and existing conditions as they relate to the BART to Livermore Extension Project, discusses the applicable State of California (State) and federal regulations, and assesses the potential impacts to transportation from construction and operation of the Proposed Project and Alternatives.

Figure 3.B-1 illustrates the overall transportation study area in eastern Alameda County. The study area—which comprises the cities of Dublin, Pleasanton, and Livermore, as well as portions of unincorporated Alameda County—generally extends from Greenville Road on the east, Dublin Boulevard and North Canyons Parkway on the north, Interstate Highway (I-) 680 on the west, and Stanley Boulevard on the south. The facilities included in the analysis vary according to transportation sub-topic, as noted in the subsections that follow.

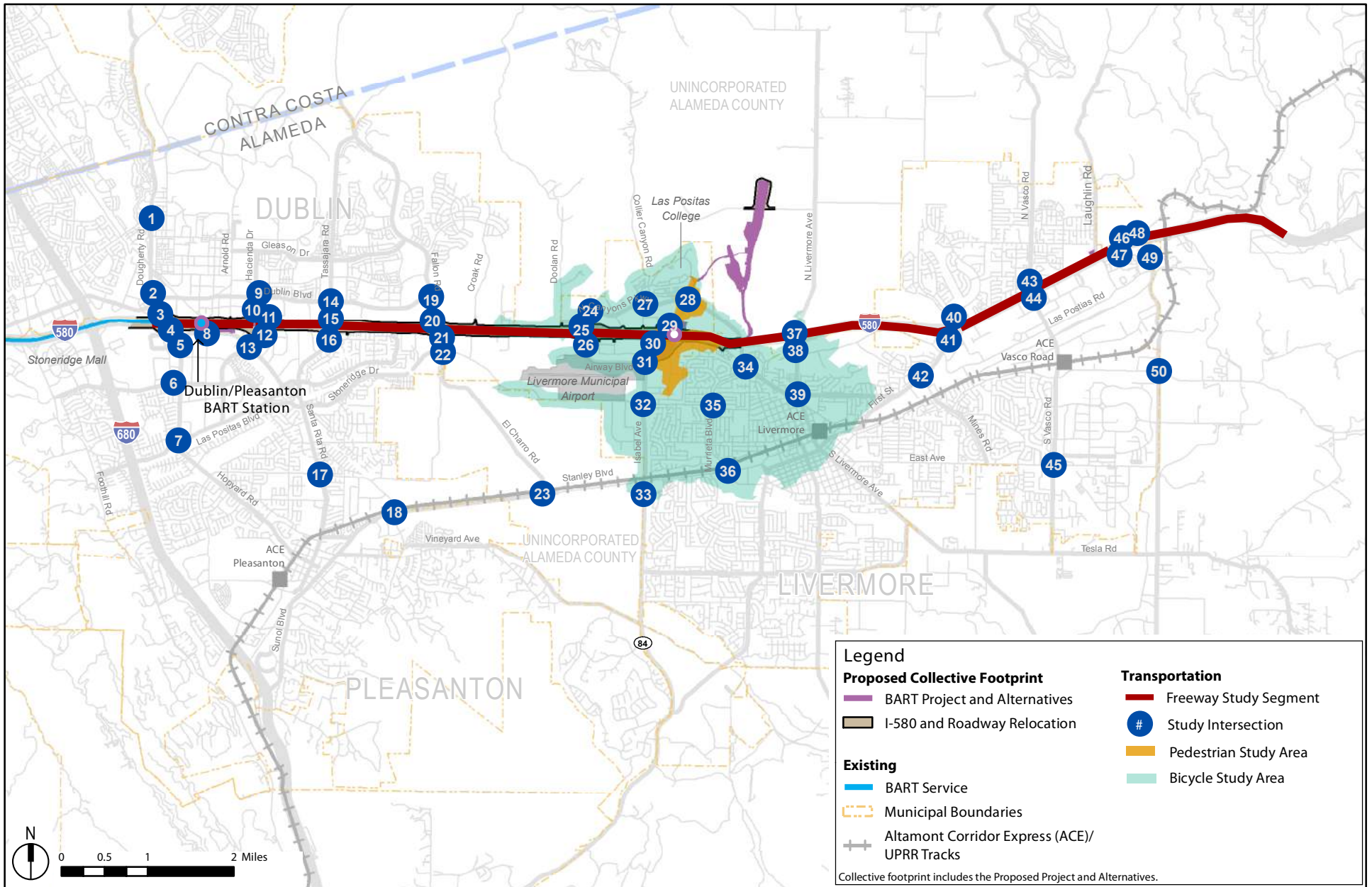
This section addresses impacts for the following resource topics:

- Freeway segments
- Local roadway intersections
- Transit, including the BART system and other nearby transit services
- Bicyclists
- Pedestrians
- Vehicle miles traveled (VMT)

Comments pertaining to transportation were received in response to the Notice of Preparation for this EIR and during the public scoping meeting held for the EIR. These comments focused on increased traffic from automobiles traveling on Collier Canyon Road. Traffic volumes on Collier Canyon Road would remain unchanged as a result of the Proposed Project and all Alternatives in 2040.

### **2. Existing Conditions**

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



Source: Arup, 2017.

Figure 3.B-1  
Transportation  
Study Areas

### **a. 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.

### **b. Local Setting**

This subsection describes the existing conditions related to freeway segments, local roadway intersections, transit, bicycles, and pedestrians.

#### **(1) Freeway Segments**

The key regional freeway route through the study area is I-580. Table 3.B-1 and Figure 3.B-2 identify 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.

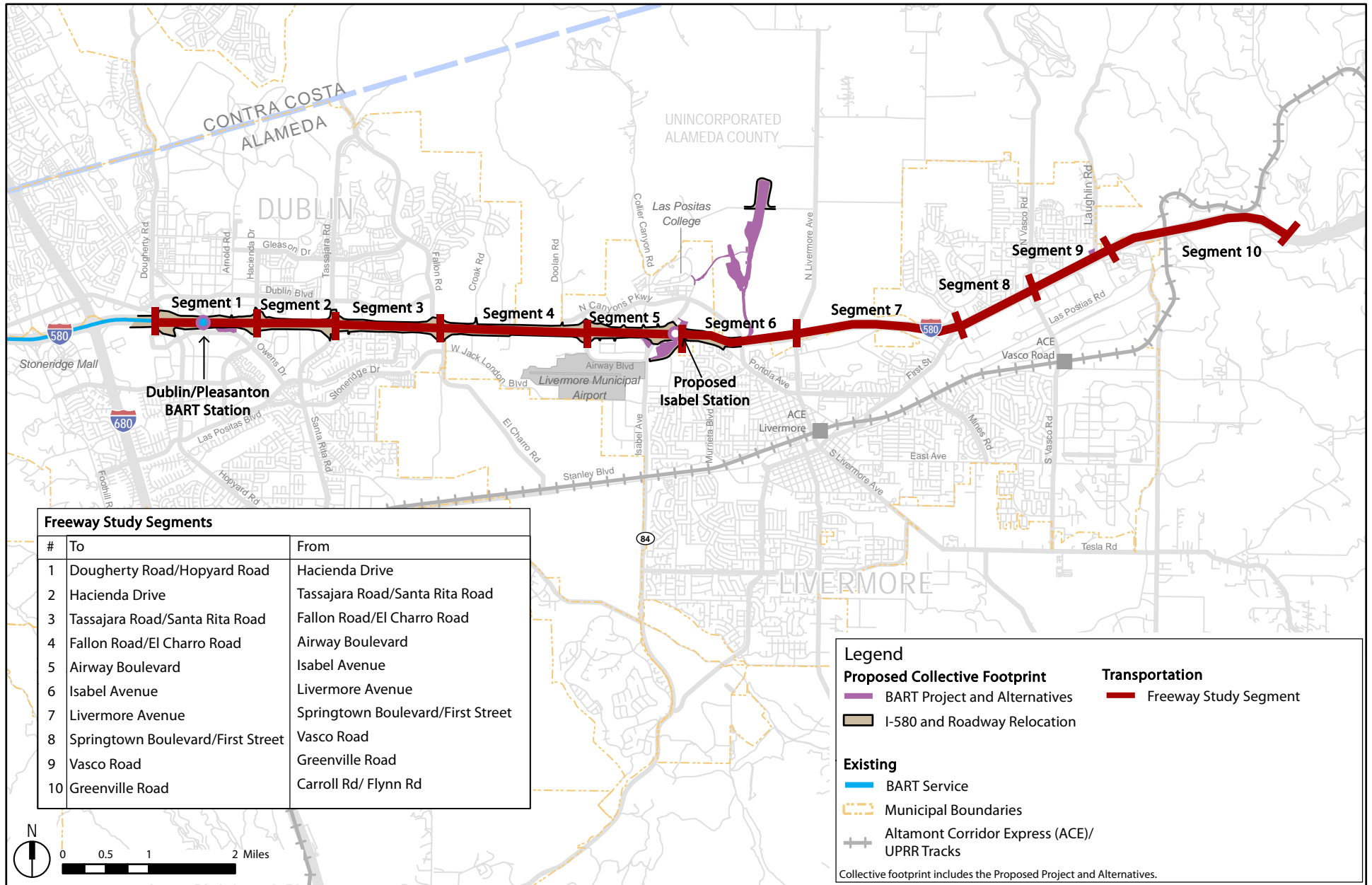
I-580 is a freeway that runs east-west from I-5 near Tracy to United States (U.S.) Highway 101 in San Rafael. I-580 connects the Bay Area with San Joaquin County and is a major inter-regional route for commuting, truck commerce, and recreational travel. Through the study area, I-580 currently features 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.

**TABLE 3.B-1 I-580 GENERAL-PURPOSE FREEWAY LEVEL OF SERVICE, EXISTING (2014)**

#	To	From	AM Peak Hour		PM Peak Hour	
			WB LOS	EB LOS	WB LOS	EB LOS
1	Dougherty Road/Hopyard Road	Hacienda Drive	D	A	C	E
2	Hacienda Drive	Tassajara Road/Santa Rita Road	D	A	C	E
3	Tassajara Road/Santa Rita Road	Fallon Road/El Charro Road	D	A	B	E
4	Fallon Road/El Charro Road	Airway Boulevard	E	A	A	D
5	Airway Boulevard	Isabel Avenue	F	A	A	E
6	Isabel Avenue	Livermore Avenue	F	A	A	E
7	Livermore Avenue	Springtown Boulevard/First Street	F	A	A	D
8	Springtown Boulevard/First Street	Vasco Road	F	A	A	F
9	Vasco Road	Greenville Road	F	A	A	F
10	Greenville Road	Carroll Road/ Flynn Road	E	A	A	E

Notes: EB = eastbound; WB = westbound; LOS = level of service.

Source: Alameda County Transportation Commission (Alameda CTC), 2014.



Source: Arup, 2017.

Figure 3.B-2  
 Transportation  
 Freeway Study Area

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.<sup>1</sup>

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).<sup>2</sup>

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 subsection below. Existing freeway operations were evaluated using information from the Alameda County Congestion Management Program 2014 LOS Monitoring Study<sup>3</sup> developed by the Alameda County Transportation Commission (Alameda CTC). Table 3.B-1 summarizes the AM and PM LOS results for the general-purpose lanes.

## **(2) Local Roadways and Intersections**

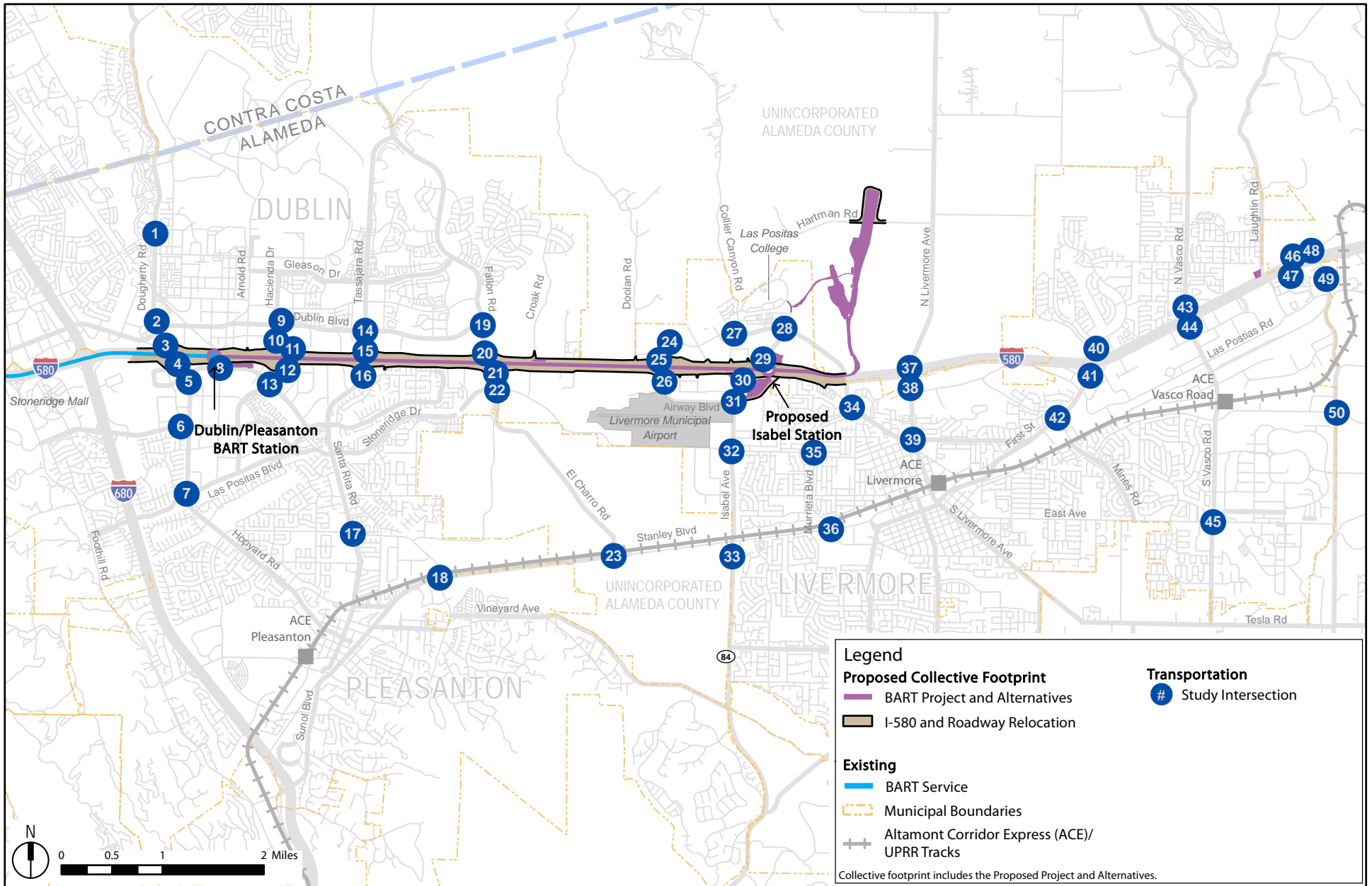
The local roadway network for the study area includes arterials, collectors, and local streets. This network is described below from north to south and east to west, as designated in general plan documents for the relevant jurisdictions. The roadway intersections included in this analysis are based on consultation with local jurisdictions, and the intersection location along major travel routes that may be affected by the Proposed Project and Build Alternatives. Figure 3.B-3 identifies the intersections analyzed as part of this study.

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<sup>1</sup> California Department of Transportation (Caltrans), 2015. Traffic Volumes on the California State Highway System.

<sup>2</sup> Ibid.

<sup>3</sup> Alameda County Transportation Commission (Alameda CTC), 2014. Alameda CTC 2014 Level of Service Monitoring Report. Spring.



Source: Arup, 2017.

**Figure 3.B-3**  
**Transportation**  
**Study Area Intersections**

Operating conditions on the study area roadways were determined by measuring the effect of traffic on intersections in the site vicinity during the AM and PM peak hours, when traffic is typically the highest and when the Proposed Project and Build Alternatives are expected to generate the most vehicular traffic. Traffic conditions at study intersections, listed in Table 3.B-2, were evaluated using the Highway Capacity Manual (HCM) 2000<sup>4</sup> LOS methodology, as described in the Impact Methodology subsection below.

**(a) City of Dublin**

In Dublin, the major streets in the project study area are Dublin Boulevard, Hacienda Drive, Dougherty Road, Tassajara Road, and Fallon Road. Vehicles use this network of arterials to access the collector streets, which provide access to homes, retail centers, transit facilities, and businesses on the local street network.

- **Dublin Boulevard** is a major east-west arterial that runs from west of San Ramon Road east to Fallon Road. This arterial is primarily a four- to six-lane road with a median. It is the principal east-west route to the Dublin/Pleasanton BART Station (Dublin/Pleasanton Station). Bicycle lanes and sidewalks are provided on portions of Dublin Boulevard.
- **Hacienda Drive** is a north-south arterial that connects I-580 to Dublin to the north (as far as Gleason Road) and Pleasanton to the south (as far as Las Positas Boulevard). It is a six-lane road with a landscaped median. Sidewalks and bicycle lanes are provided along Hacienda Drive from the I-580 interchange to Gleason Drive.
- **Dougherty Road** is a major north-south arterial that connects Crow Canyon Road in the north in San Ramon to I-580 in the south. It is primarily a four- to six-lane road. Sidewalks are provided along both sides of the arterial.
- **Tassajara Road** is a major north-south arterial that connects I-580 with points north. Tassajara Road continues south into Pleasanton as Santa Rita Road. Tassajara Road is a four- to six-lane arterial, with bicycle lanes and sidewalks adjacent to the road provided.
- **Fallon Road** is a major north-south arterial that connects I-580 with Tassajara Road to the north. Fallon Road continues south into Pleasanton as El Charro Road. Fallon Road is a four- to six-lane road, with bicycle lanes and sidewalks adjacent to the road provided.

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<sup>4</sup> Transportation Research Board, 2000. Highway Capacity Manual.



TABLE 3.B-2 INTERSECTION LEVEL OF SERVICE, EXISTING (2013)

#	Intersection	Control	Location	AM Peak Hour		PM Peak Hour	
				Avg. Delay (sec)	LOS	Avg. Delay (sec)	LOS
1	Dougherty Road & Amador Valley Road	Signal	Dublin	53.0	D	37.1	D
2	Hopyard Road/Dougherty Road & Dublin Boulevard	Signal	Dublin	41.5	D	56.9	E
3	Dougherty Road/Hopyard Road & I-580 WB Ramps	Signal	Dublin	12.1	B	12.6	B
4	Hopyard Road/Dougherty Road & I-580 EB Ramps	Signal	Pleasanton	50.2	D	27.9	C
5	Hopyard Road & Owens Road	Signal	Pleasanton	37.6	D	180.9	F
6	Hopyard Road & Stoneridge Drive	Signal	Pleasanton	25.5	C	42.2	D
7	Hopyard Road & Las Positas Boulevard	Signal	Pleasanton	27.0	C	13.1	B
8	Willow Road & Owens Road	Signal	Dublin	11.4	B	29.6	C
9	Hacienda Drive & Dublin Boulevard	Signal	Dublin	23.7	C	23.1	C
10	Hacienda Drive & Martinelli Boulevard/Hacienda Crossings	Signal	Dublin	19.1	B	8.6	A
11	Hacienda Drive & I-580 WB Ramps	Signal	Pleasanton	7.8	A	15.9	B
12	Hacienda Drive & I-580 EB Ramps	Signal	Pleasanton	11.9	B	51.0	D
13	Hacienda Drive & Owens Road	Signal	Dublin	43.2	D	47.2	D
14	Tassajara Road & Dublin Boulevard	Signal	Dublin	41.8	D	9.8	A
15	Tassajara Road & I-580 WB Ramps	Signal	Pleasanton	10.2	B	29.3	C
16	Santa Rita Road & I-580 EB Ramps/Pimlico Drive	Signal	Pleasanton	33.2	C	54.4	D
17	Santa Rita Road & Valley Avenue	Signal	Pleasanton	45.3	D	35.3	D
18	Bernal Avenue/Valley Avenue & Stanley Boulevard	Signal	Dublin	35.3	D	12.1	B
19	Fallon Road & Dublin Boulevard/Croak Road	Signal	Dublin	22.0	C	8.1	A
20	El Charro Road/Fallon Road & I-580 WB Ramps	Signal	Livermore	8.3	A	6.2	A
21	El Charro Road & I-580 EB Ramps	Signal	Livermore	5.9	A	26.3	C
22	El Charro Road & Stoneridge Drive/Jack London Boulevard	Signal	Livermore	20.8	C	N/A	N/A

**TABLE 3.B-2 INTERSECTION LEVEL OF SERVICE, EXISTING (2013)**

#	Intersection	Control	Location	AM Peak Hour		PM Peak Hour	
				Avg. Delay (sec)	LOS	Avg. Delay (sec)	LOS
23	Stanley Boulevard & El Charro Road	Signal	Livermore	N/A	N/A	15.8	B
24	Airway Boulevard/Driveway & North Canyons Parkway	Signal	Livermore	7.0	A	4.7	A
25	Airway Boulevard & I-580 WB Ramps	Signal	Livermore	3.1	A	36.1	D
26	Airway Boulevard & I-580 EB Ramps/Kitty Hawk Road	Signal	Livermore	35.4	D	26.1	C
27	Collier Canyon Road & North Canyons Parkway/Portola Avenue	Signal	Livermore	23.3	C	23.5	C
28	Isabel Avenue/Campus Hill Drive & Portola Avenue	Signal	Livermore	25.5	C	8.3	A
29	Isabel Avenue & I-580 WB Ramps	Signal	Livermore	7.8	A	5.2	A
30	Isabel Avenue & I-580 EB Ramps	Signal	Livermore	6.3	A	23.3	C
31	Isabel Avenue & Airway Boulevard	Signal	Livermore	27.7	C	45.3	D
32	Isabel Avenue & Jack London Boulevard	Signal	Livermore	93.6	F	15.4	B
33	Isabel Avenue Connector & Stanley Boulevard	Signal	Livermore	18.8	B	13.1	B
34	Murrieta Boulevard/Driveway & Portola Avenue	Signal	Pleasanton	23.7	C	30.1	C
35	Murrieta Boulevard & Jack London Boulevard	Signal	Livermore	17.8	B	17.3	B
36	Murrieta Boulevard & Stanley Boulevard	Signal	Livermore	48.6	D	44.5	D
37	Livermore Avenue & I-580 WB Ramps	Signal	Livermore	33.2	C	12.9	B
38	Livermore Avenue & I-580 EB Ramps	Signal	Livermore	15.6	B	148.3	F
39	Livermore Avenue & Portola Avenue	Signal	Livermore	38.6	D	36.4	D
40	First Street/Springtown Boulevard & I-580 WB Ramps	Signal	Livermore	8.4	A	5.7	A
41	First Street & I-580 EB Ramps	Signal	Livermore	8.4	A	29.8	C
42	First Street & Mines Road	Signal	Livermore	27.8	C	63.3	E
43	Vasco Road / I-580 WB Ramps	TWSC	Livermore	0.9	A	1.1	A
44	Vasco Road / I-580 EB Ramps	TWSC	Livermore	0.3	A	0.6	A

**TABLE 3.B-2 INTERSECTION LEVEL OF SERVICE, EXISTING (2013)**

#	Intersection	Control	Location	AM Peak Hour		PM Peak Hour	
				Avg. Delay (sec)	LOS	Avg. Delay (sec)	LOS
45	Vasco Road & East Avenue	Signal	Livermore	16.3	B	77.3	E
46	Greenville Road & I-580 WB Ramps	Signal	Livermore	11.7	B	4.6	A
47	Greenville Road & I-580 EB Ramps	Signal	Livermore	9.6	A	13.6	B
48	Greenville Road /Altamont Pass Road	Signal	Livermore	80.8	F	47.7	E
49	Greenville Road & Southfront Road	Signal	Livermore	10.9	B	13.6	B
50	Greenville Road / Patterson Pass Road	TWSC	Livermore	>120	F	>120	F

Notes: LOS = level of service; Avg. = average; sec = seconds; TWSC = two-way stop controlled; WB = westbound; EB = eastbound; N/A = not applicable.  
 Sources: Arup, 2017; Cambridge Systematics, 2017.

**(b) City of Pleasanton**

In Pleasanton, the major streets in the project study area are, Stoneridge Drive, Owens Drive, Hopyard Road, Hacienda Drive, Valley Avenue, Santa Rita Road, and El Charro Road. Vehicles use this network of arterials to access the collector streets that provide access to homes and businesses on the local street network.

- **Stoneridge Drive** is generally a four- to six-lane minor arterial in Pleasanton that extends from Foothill Road east of I-680 to El Charro Road. The roadway is temporarily narrowed across the Arroyo Mocho to provide one travel lane in each direction. Bicycle lanes and sidewalks are provided on Stoneridge Drive. Stoneridge Drive is a route of regional significance.
- **Owens Drive** is a six-lane east-west arterial running along the northern edge of Pleasanton, parallel to I-580. Owens Drive terminates at Johnson Drive to the east and at West Las Positas Boulevard to the west. Owens Drive is a principal access route to the Dublin/Pleasanton Station. Owens Drive has bicycle and pedestrian facilities along the majority of the corridor as well as a landscaped median.
- **Hopyard Road** is a north-south arterial that connects southern Pleasanton with I-580, where it continues north into Dublin as Dougherty Road. Hopyard Road is a two- to six-lane arterial, with bicycle lanes and sidewalks provided adjacent to the road.

- **Valley Avenue** is an arterial tracing a semi-circular path through Pleasanton. It is a two- to four-lane arterial that connects Bernal Avenue in the west to Hopyard Road, Santa Rita Road, Stanley Boulevard, Vineyard Avenue and returns to Bernal Road in the east. Bicycle lanes are provided on portions of the corridor, and sidewalks are provided along much of the corridor.
- **Santa Rita Road** is a six-lane arterial that connects southern Pleasanton with I-580. Santa Rita Road connects with Main Street to the south and continues north into Dublin as Tassajara Road. Santa Rita Road includes adjacent bicycle and pedestrian facilities.
- **El Charro Road** is a four-lane minor arterial in Pleasanton between Stoneridge Drive/Jack London Boulevard and I-580, where it continues north into Dublin as Fallon Road. As part of the development of the East Pleasanton Specific Plan area, El Charro Road would be upgraded and extended to connect I-580 and Stanley Boulevard as a four-lane facility (two lanes in each direction) with pedestrian and bicycle facilities.

**(c) 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 of Livermore. 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. This arterial is primarily a two-lane undivided roadway, providing access between the Doolan Canyon Regional Preserve and the city of Livermore. The speed limit is 35 miles per hour (mph) along the entire roadway.
- **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 street terminates at Doolan Road to the west and connects to Portola Avenue to the east.
- **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.

- **Vallecitos/Holmes Road** begins at State Route 84 as a two-lane road and extends northeast as a four to five-lane road as Holmes Road until it meets First Street in downtown Livermore. Sidewalks are present along Vallecitos/Holmes Road north of Wetmore Road. Class II bike lanes are featured along Vallecitos Road between Wetmore Road and Concannon Boulevard.
- **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 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.
- **P Street** extends from College Avenue to Portola Avenue in Livermore. It is a five-lane road for the majority of its length, featuring on-street parking and sidewalks along its entire length. Class II bicycle lanes are present on P Street between Chestnut Street and Portola Avenue.
- **Livermore Avenue** is a major north-south arterial that extends throughout the entire length of the city of Livermore. 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 subareas 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.

- **Las Positas Road** is an east-west arterial south of I-580 along northern of Livermore. This arterial is primarily a four-lane divided roadway with bicycle lanes throughout and left-turn pockets at key locations.
- **Springtown Boulevard** is a four-lane road that spans from I-580 to Galloway Street with sidewalks along its entire length. Class II bicycle lanes are present along Springtown Boulevard between Lassen Road and Shire Court.
- **Stanley Boulevard** is a four to five-lane road that extends from Santa Rita Road in Pleasanton to First Street in Livermore. The road features sidewalks and Class II bicycle lanes along its entire length.
- **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 is a two-lane facility. 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 of Livermore 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.

Dublin, Pleasanton, and 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, Sunflower Court, Bluebell Drive, 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.

### **(3) Transit**

The BART system facilities are described below, followed by other transit services.

#### **(a) 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 ten 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.

Table 3.B-3 below shows the average systemwide peak hour loads for existing conditions.

**TABLE 3.B-3 BART SYSTEMWIDE AVERAGE PEAK-HOUR LOAD AT MAXIMUM LOAD POINTS, EXISTING**

Peak-Hour	Passengers per Car (2013)
AM	107
PM	109

Source: Arup, 2013.

Table 3.B-4 below shows the existing morning peak hour loads at select stations along the Dublin/Pleasanton-Daly City line in the westbound.

**TABLE 3.B-4 ARRIVING TRAIN PEAK-HOUR LOAD, DUBLIN/PLEASANTON-DALY CITY LINE AT SELECTED STATIONS, AM PEAK DIRECTION (WESTBOUND), EXISTING**

Selected Stations	Passengers per Car (2013)
Bay Fair	82
Coliseum/OAK	98
West Oakland	104
Embarcadero	110

Source: Arup, 2013.

**(b) 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.B-5 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.B-5 SURROUNDING TRANSIT SERVICES, EXISTING**

Operator	Route	Existing Peak Headway	Existing Service Span	Route Overview
LAVTA	10	30 min	<ul style="list-style-type: none"> <li>▪ Weekday: 4:00 a.m. – 1:14 a.m.</li> <li>▪ Saturday: 4:57 a.m. – 1:14 a.m.</li> <li>▪ Sunday: 5:17 a.m. – 1:14 a.m.</li> </ul>	LLNL to Dublin/Pleasanton Station (to Stoneridge Mall on weekends and M-F 7:20-11:56 p.m. only).
LAVTA	12	30 min	<ul style="list-style-type: none"> <li>▪ Weekday: 6:00 a.m. – 10:40 p.m.</li> <li>▪ Weekend (<i>Sunday only</i>): 6:00 a.m. – 10:40 p.m.</li> </ul>	Livermore Transit Center to Stoneridge Mall via Dublin/Pleasanton Station
LAVTA	12X	45 min	<ul style="list-style-type: none"> <li>▪ Weekday: 6:00 a.m. – 9:15 p.m.</li> <li>▪ Weekend: No service</li> </ul>	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	<ul style="list-style-type: none"> <li>▪ Weekday: 6:15-10:00 a.m. &amp; 4:00-6:40 p.m.</li> <li>▪ Weekend: <i>No service</i></li> </ul>	Dublin/Pleasanton Station, Greenville Road, LLNL/SNL, Livermore Transit Center
LAVTA	Rapid Route	15 min	<ul style="list-style-type: none"> <li>▪ Weekday: 5:30 a.m. – 8:00 p.m.</li> </ul>	Dublin/Pleasanton Station to Livermore Transit Center
RTD	150	60 min	<ul style="list-style-type: none"> <li>▪ Weekday: 4:10 a.m. – 10:20 p.m.</li> <li>▪ Weekend: <i>No service</i></li> </ul>	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 outbound trips in p.m.)	<ul style="list-style-type: none"> <li>▪ Weekday: 4:40-9:00 a.m. &amp; 3:45-8:00 p.m.</li> <li>▪ Weekend: <i>No service</i></li> </ul>	Modesto Downtown Transportation Center, Sisk Road Orchard Supply Hardware Parking Lot (Modesto), Dublin/Pleasanton Station
SJRRC	ACE	30 min (four inbound trips in a.m. and four outbound trips in p.m.)	<ul style="list-style-type: none"> <li>▪ Weekday: 4:20-9:17 a.m. &amp; 3:35-8:50 p.m.</li> <li>▪ Weekend: <i>No service</i></li> </ul>	Downtown Stockton Transit Center to San Jose (via Livermore and Pleasanton)
StaRT	Commuter	One trip per peak period, peak direction	<ul style="list-style-type: none"> <li>▪ Weekday: 4:15-6:10 a.m. &amp; 4:20-6:20 p.m.</li> </ul>	Turlock, Patterson, Pleasanton via I-5 and I-580
County Connection	35	30 min (peak) 60 min (off peak)	<ul style="list-style-type: none"> <li>▪ Weekday: 6:00 a.m. – 8:17 p.m.</li> <li>▪ Weekend: <i>No service</i></li> </ul>	San Ramon Transit Center, Bollinger Canyon Road, Dougherty Road, Dublin/Pleasanton Station

**TABLE 3.B-5 SURROUNDING TRANSIT SERVICES, EXISTING**

Operator	Route	Existing Peak Headway	Existing Service Span	Route Overview
County Connection	36	60 min	<ul style="list-style-type: none"> <li>▪ Weekday: 6:15 a.m. – 9:00 p.m.</li> <li>▪ Weekend: <i>No service</i></li> </ul>	San Ramon Transit Center, San Ramon, Dublin/Pleasanton Station
County Connection	97X	30 min (peak) No off-peak service	<ul style="list-style-type: none"> <li>▪ Weekday: 6:30 a.m. – 7:00 p.m.</li> </ul>	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 ten 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. Accordingly, at this time, the long-term prospect of a future connection between ACE and BART is considered speculative, and not a reasonably foreseeable future project for purposes of the BART to Livermore Extension Project 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 the city of Turlock, via the city of 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.B-6.

**TABLE 3.B-6 WEEKDAY RIDERSHIP, EXISTING**

Operator	Route	Ridership
LAVTA	10	1,470
LAVTA	12/12X	490
LAVTA	20X	60
LAVTA	Rapid Route	1,440
SJRRC	ACE	4,380

Notes: LAVTA = Livermore-Amador Valley Transit Authority; SJRRC = San Joaquin Regional Rail Commission; ACE = Altamont Corridor Express.

Sources: Livermore-Amador Valley Transit Authority (LAVTA), 2014; San Joaquin Regional Rail Commission (SJRRC), 2014.

**(4) Bicycle Facilities**

Bicycle facilities include three types: Class I off-street paths and trails; Class II on-street bicycle lanes; and Class III on-street bicycle routes. Bicycle paths and trails provide exclusive use for bicyclists separate from the vehicle road network. Bicycle lanes provide a restricted right-of-way (ROW) for the exclusive use of bicycles with a striped lane on the street. Bicycle routes (Class III) provide a shared facility with pedestrians or motor vehicles designated with signage and/or pavement markings.

The bicycle study area includes all bicycle facilities within a 15-minute bike ride of the proposed Isabel Station. This area is roughly bounded by Stanley Boulevard to the south, past North Canyon Parkway to the north, past Doolan Road to the west, and past North Livermore Avenue to the east. On-street bicycle facilities are designated on the majority of arterial and collector streets in the study area. Existing bicycle facilities and facilities planned by the City of Livermore are shown in Figure 3.B-4.

On-street bicycle (Class II) facilities that serve the study area include the following:

- Airway Boulevard from North Canyons Parkway to Kitty Hawk Road/Isabel Avenue
- Collier Creek Canyon Road from Portola Avenue to I-580
- Isabel Avenue between Portola Avenue and Jack London Boulevard
- Jack London Boulevard between El Charro Road and Murrieta Boulevard
- Portola Avenue between Doolan Road and First Street
- Rincon Street between Portola Avenue and East Jack London Boulevard
- North P Street between Portola Avenue and Chestnut Street
- North Livermore Avenue between Las Positas Road Portola Avenue
- Junction Avenue between East Jack London Boulevard and Railroad Avenue
- Hageman Drive between East Jack London Boulevard and Daisyfield Drive

Within the study area, most of the major arterials have Class II bike lanes. This network provides north-south and east-west corridors through the area. Streets with no bike infrastructure generally serve residential uses and do not have high vehicle traffic volumes.

## **(5) Trails**

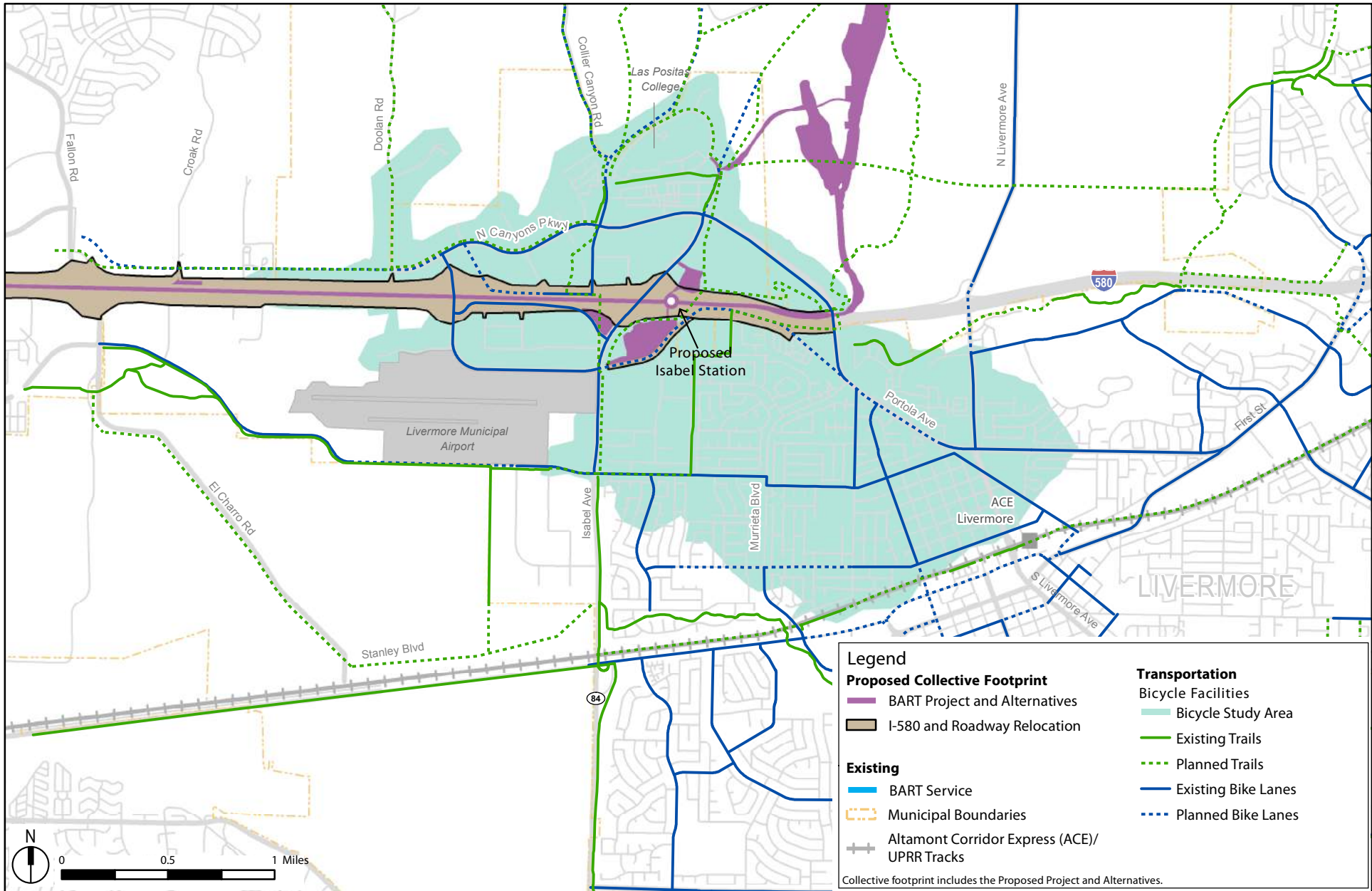
The study area includes a network of Class I trails along major roadways, canals, creeks, and railroad corridors. These trails serve bicycles as well as pedestrians; some are also open for equestrian use. The existing trail network is shown on Figure 3.B-4, including trail designations by the city of Livermore as well as the East Bay Regional Park District and Livermore Area Recreation and Park District.<sup>5, 6, 7</sup> In addition, many of these trails are considered to be of regional significance and are included in the Alameda Countywide

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<sup>5</sup> City of Livermore, 2011. Livermore Bikeways Map. Available at: <http://www.cityoflivermore.net/civicax/filebank/documents/3620/>.

<sup>6</sup> City of Pleasanton, 2007. Existing Community Trails & Bikeways.

<sup>7</sup> City of Dublin, 2012. Bike Lanes and Trails in the City of Dublin. April. Available at: <http://dublinca.gov/DocumentCenter/View/7886>.



Source: Arup, 2017.

Figure 3.B-4  
 Transportation  
 Bicycle Facilities – Existing and Planned

Bicycle Plan and the Regional Bicycle Plan for the San Francisco Bay Area.<sup>8, 9</sup> The existing trails in the vicinity of the Proposed Project and Build Alternatives footprints are as follows:

- Altamont Creek Trail – Sections of this trail are in the city of Livermore along Altamont Creek between Hartford Avenue and Laughlin Road.
- Collier Canyon Creek Trail – This trail runs north-south in the city of Livermore along Collier Canyon Creek from Las Positas College to I-580.
- Iron Horse Trail – This north-south trail serves the existing Dublin/Pleasanton Station from Concord to the north along the abandoned Southern Pacific ROW. This trail is maintained by the East Bay Regional Park District. An extension of this trail as far south as the existing Stanley Boulevard Trail has been proposed.
- Isabel Trail – This trail runs along the new section of Isabel Avenue from Jack London Boulevard to Alden Lane (south of Concannon Boulevard) in the city of Livermore.
- Las Positas Trail – Sections of this trail are in the city of Livermore, south of I-580 along Las Positas Creek to the west and east of North Livermore Avenue, and north of I-580 from west of Springtown Boulevard to Northfront Road at I-580.
- Stealth Street Trail – This trail generally runs adjacent to Stealth Street between Airway Boulevard and Jack London Boulevard.

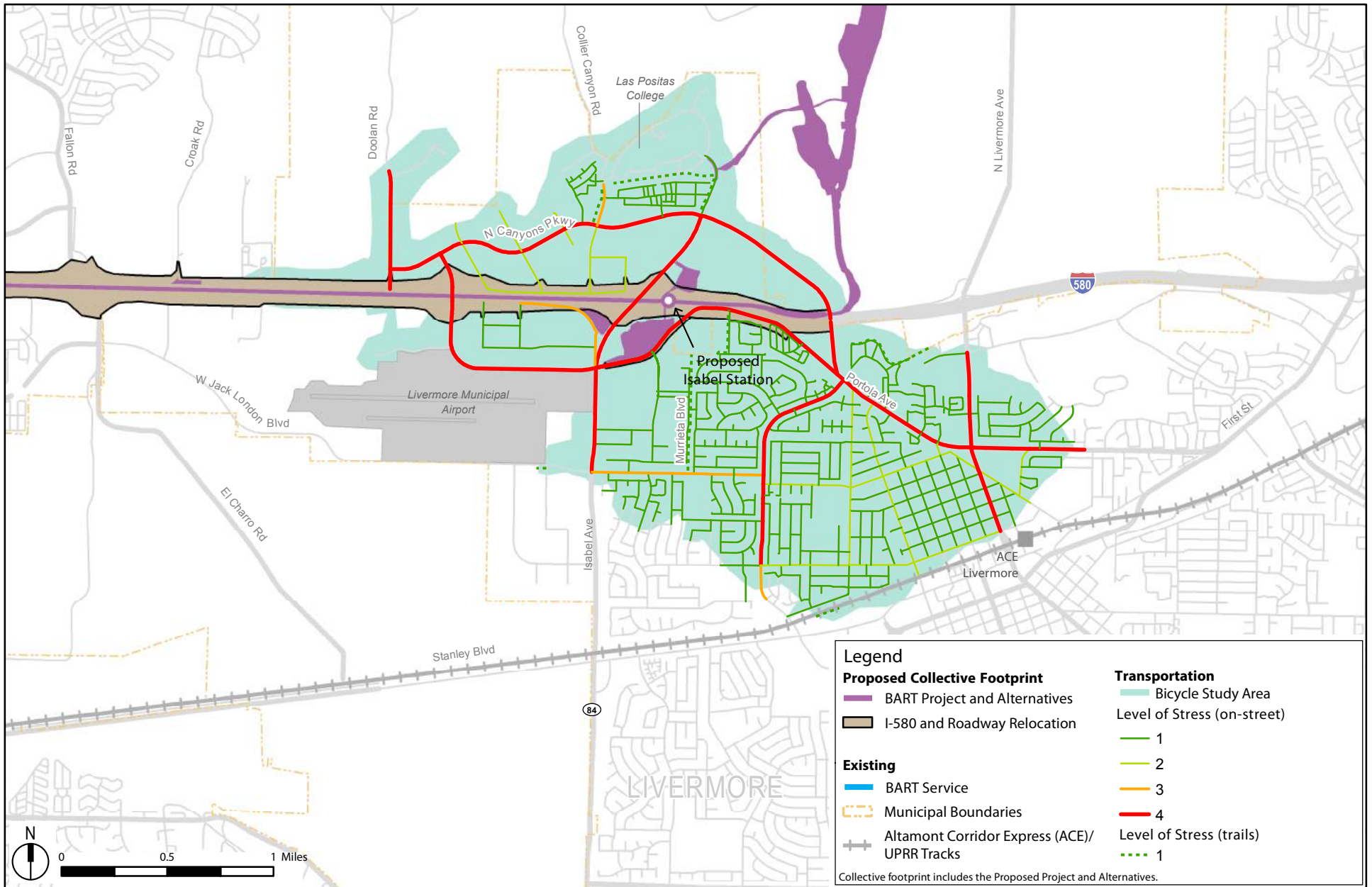
This report evaluates bicycle facilities using the level of traffic stress (LTS) methodology developed by the Mineta Transportation Institute in San Jose, California. The LTS method is an evaluation model that identifies streets with high traffic stress experienced by people biking in or adjacent to high vehicle traffic streets. The method classifies streets and intersections from LTS 1 (suitable for children) through LTS 4 (suitable for riders who are comfortable sharing the road with automobiles traveling at 35 mph or more). Bikeways are considered low stress if they are on low traffic/ low speed streets or, as roadway volumes and speeds increase, the physical separation between bikeways and traffic lanes also increases, such as bike lanes and protected bike lanes.

For more information about the bicycle facility LTS methodology, please see the Impact Methodology subsection below. Figure 3.B-5 summarizes LTS results for the bicycle facilities in the study area.

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<sup>8</sup> Metropolitan Transportation Commission (MTC), 2012. Alameda Countywide Bicycle Plan. Available at: [http://www.alamedactc.org/files/managed/Document/10093/ACTC\\_Ped\\_Plan\\_Final\\_10-25-12\\_011013.pdf](http://www.alamedactc.org/files/managed/Document/10093/ACTC_Ped_Plan_Final_10-25-12_011013.pdf). October.

<sup>9</sup> Metropolitan Transportation Commission (MTC), 2009. Regional Bicycle Plan for the San Francisco Bay Area.



Source: Arup, 2017.

Figure 3.B-5  
Transportation  
Bicycle Level of Stress – Existing

## **(6) Pedestrians**

The study area for pedestrians comprises all pedestrian facilities, including sidewalks, street crossings, and off-street paths, within a 15-minute walk from the proposed Isabel Station. Figure 3.B-6 below shows the pedestrian study area, including existing sidewalks, pedestrian street crossings, and off-street paths, as well as facility gaps.

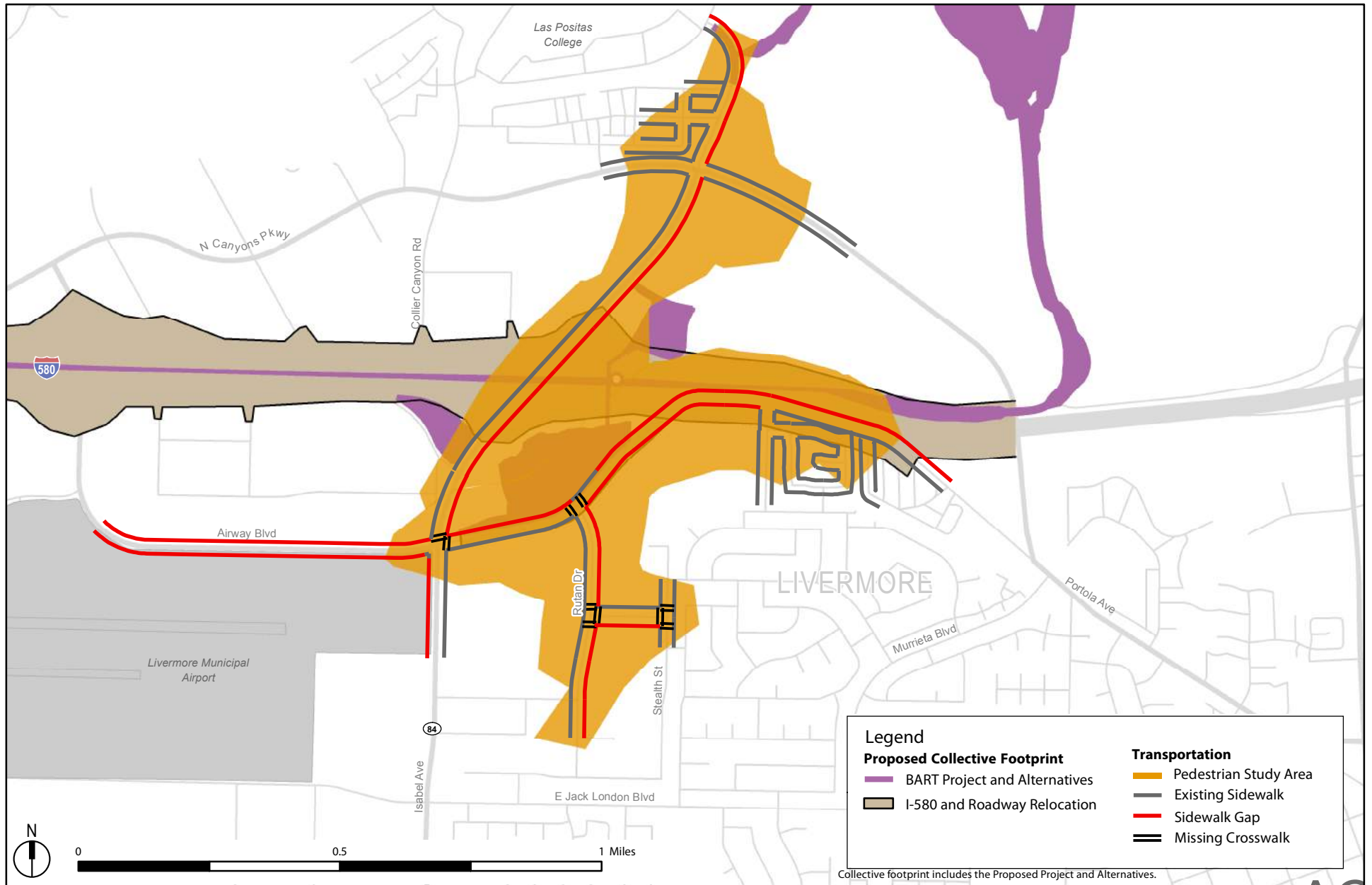
Sidewalks exist throughout the study area, but lack consistency and continuity. Although there are sidewalks on most roads, major gaps appear throughout the study area. The sidewalks range in width from 5 to 10 feet at various locations, and are generally in good condition. The roadways in the study area are mostly wide, multi-lane arterials, and adjacent land uses are sporadic, with stretches of undeveloped land in between developed parcels. Crosswalks exist at most of the study intersections, but on many major arterials, pedestrian crossings are only in place along one approach in the north-south or east-west directions.

Sidewalks generally exist along the major thoroughfares around the proposed Isabel Station, except at the following locations:

- East side of Isabel Avenue from Airway Boulevard to Portola Avenue
- East side of Campus Hill Drive to Campus Loop
- West side of Isabel Avenue south of Airway Boulevard
- North side of Airway Boulevard for the entirety of the study area, except for the commuter park-and-ride lot
- Portions of the south side of Airway Boulevard between Rutan Drive and Sutter Street
- East side of Rutan Drive from Airway Boulevard to Rickenbacker Place
- South side of Sonic Avenue

Pedestrian access to existing bus transit service is available but indirect, with bus transit connections primarily along major arterials and collector roads, with minimal access along local streets, resulting in long door-to-door trip times. There are no existing sidewalks on the east side of Isabel Avenue turning east onto Airway Boulevard for accessing the existing BART park-and-ride lot on Airway Boulevard near Isabel Avenue. Pedestrians walking from north of I-580 who use Isabel Avenue to access the existing park-and-ride lot need to walk on the west side of Isabel Avenue, cross to the south side of Airway Boulevard to head east, and then must cross to the north side of Airway Boulevard close to the entrance to the park-and-ride lot.





Source: Arup, 2017.

**Figure 3.B-6**  
**Transportation**  
**Pedestrian Facilities and Gaps – Existing**

Two major intersections provide direct pedestrian access to the proposed Isabel Station—Isabel Avenue/Airway Boulevard and Isabel Avenue/Portola Avenue—as discussed below.

- **Isabel Avenue/Airway Boulevard.** At this intersection sidewalks are present west of Isabel but not to the east, and along the southern edge of Airway Boulevard, sidewalks are present east of Isabel Avenue but not to the west. Only two of the four legs of this intersection currently feature a striped pedestrian crossing. The south leg of the intersection is a 140-foot-long crossing of Isabel Avenue that includes eight traffic lanes, two bike lanes, and a painted median. The west leg is a 75-foot-long crossing of Airway Boulevard that includes four traffic lanes. Some of the approaches feature vehicle free-right turns, presenting additional complexity for pedestrian crossing conditions.
- **Isabel Avenue/Portola Avenue/Campus Hill Drive.** This intersection also lacks some pedestrian facilities. Although there is an improved streetscape along Portola Avenue with wide sidewalks, there is no sidewalk on the eastern side of Isabel Avenue. There are four striped pedestrian crossings at this intersection. The south leg is a 155-foot-long crossing of Isabel Avenue that includes eight traffic lanes, two bike lanes, and a painted median. The west leg is a 140-foot-long crossing of Portola Avenue that includes six traffic lanes, two bike lanes, and a raised median. The north leg is a 125-foot-long crossing of Campus Hill Drive that includes six traffic lanes and a raised median. The east leg is a 125-foot-long crossing of Portola that includes six traffic lanes, two bike lanes, and a raised median. Some of the approaches feature vehicle free-right turns, presenting additional complexity for pedestrian crossing conditions.

In addition, at the I-580/Isabel Avenue interchange, a set of I-580 on- and off-ramps connect to Isabel Avenue, creating the need for pedestrians traveling on Isabel to cross the ramps.

- **I-580 Isabel Eastbound On- and Off-Ramp and Westbound On-Ramps/Isabel Avenue.** At the I-580/Isabel Avenue interchange, a pedestrian route across I-580 exists only on the west side of Isabel Avenue. South of I-580, to cross the I-580 eastbound off-ramp, there is a 100-foot crossing to a pedestrian island before the I-580 eastbound on-ramp with a crossing of 30 feet. North of I-580, there is a pedestrian crossing of the westbound on-ramp on Isabel with a crossing distance of 40 feet.
- **East Airway Boulevard and Rutan Drive.** This intersection lacks some pedestrian facilities. There are curb ramps, sidewalks along most of the streets, and a marked crosswalk at Rutan Drive. There are no marked crosswalks at either leg of East Airway Boulevard. Additionally, there is no sidewalk on the northern edge of Airway Boulevard to the west of Rutan Drive and along the eastern edge of Rutan Drive.

Off-street pedestrian path and trail facilities are discussed above, in the Bicycle Facilities subsection.

Pedestrian crossing delay at intersections is one way to evaluate the LOS for pedestrians. The impact methodology discussion below describes the LOS methodology in more detail. Table 3.B-7 below presents the existing pedestrian delay at the two pedestrian study intersections.

**TABLE 3.B-7 PEDESTRIAN DELAY FOR STUDY INTERSECTIONS, EXISTING (2013)**

Intersection	Delay	LOS
East Airway Boulevard & Isabel Avenue	60.0	F
Isabel Avenue & Portola Avenue	64.4	F

Notes: LOS = level of service.  
 Calculated from the Highway Capacity Manual (Transportation Research Board, 2000).  
 Source: Cambridge Systematics, 2017.

### 3. Regulatory Framework

This subsection describes the State and local environmental laws and policies relevant to transportation and focuses on LOS standards.

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, BART has determined to utilize the LOS-based methodology for significance determination in this EIR.

BART is exempt by State law (California Government Code Sections 53090 and 53091) from local city and county general plans and land use policies and ordinances. However, as background information, the relevant transportation policies of other agencies, including those contained in the city and county codes and general plans, are described

below. These local LOS standards were considered in determining the standards used in this EIR when applying the LOS-based methodology for significance determination, also discussed below.

**a. Freeway Segments**

**(1) Caltrans**

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.<sup>10</sup> 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.<sup>11</sup>

**(2) Alameda CTC**

Alameda CTC does not have adopted thresholds of significance applicable to CEQA requirements for freeway analysis purposes.<sup>12</sup> Alameda CTC's freeway monitoring efforts set LOS E as the standard for monitoring performance.<sup>13</sup>

**b. Local Roadway Intersections**

**(1) City of Dublin**

The City of Dublin General Plan identifies a goal to “strive to phase development and roadway improvements so that operating LOS for intersections within Dublin does not exceed LOS D.”<sup>14</sup>

**(2) City of Pleasanton**

The City of Pleasanton “level-of-service (LOS) standards generally require...projects to limit traffic volumes to LOS D or better throughout Pleasanton or provide mitigation measures which will ensure that traffic volumes meet this standard.”<sup>15</sup>

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<sup>10</sup> California Department of Transportation (Caltrans), 2002. Guide for the Preparation of Traffic Studies. December.

<sup>11</sup> Alameda County Transportation Commission (Alameda CTC), 2015. Congestion Management Program, Chapter 6, Land Use Analysis Program. October.

<sup>12</sup> Ibid.

<sup>13</sup> Ibid

<sup>14</sup> City of Dublin, 2014. City of Dublin General Plan, Land Use and Circulation Element.

<sup>15</sup> City of Pleasanton, 2009. City of Pleasanton General Plan 2005–2025, Circulation Element.

Additionally, according to the City of Pleasanton General Plan, “[t]here are a few exceptions to the LOS standard within Pleasanton. The exceptions are in the Downtown Area and at the City of Pleasanton gateway intersections. These intersections may have a level of service below the level-of-service D standard if no reasonable mitigation exists or if the necessary mitigation is contrary to other goals and policies of the city.”<sup>16</sup>

### (3) City of Livermore

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.”<sup>17</sup> In addition, the General Plan identifies selected intersections that may exceed the LOS standard.

#### c. 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.<sup>18</sup> 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, which is illustrated in Figure 3.B-7.

The policy created a station access investment framework that categorizes stations by type, shown in Figure 3.B-8. The Dublin/Pleasanton Station is designated as an auto-dependent station, and the proposed Isabel Station would also have that designation. For auto-dependent stations, the primary investment mode is walking, and the secondary investment modes are biking, drop-off, auto parking and transit.

Being auto-dependent stations, both Dublin/Pleasanton and the potential Isabel Station would have access mode splits reflecting much lower pedestrian and bicycle access and much higher drive-and-park access.

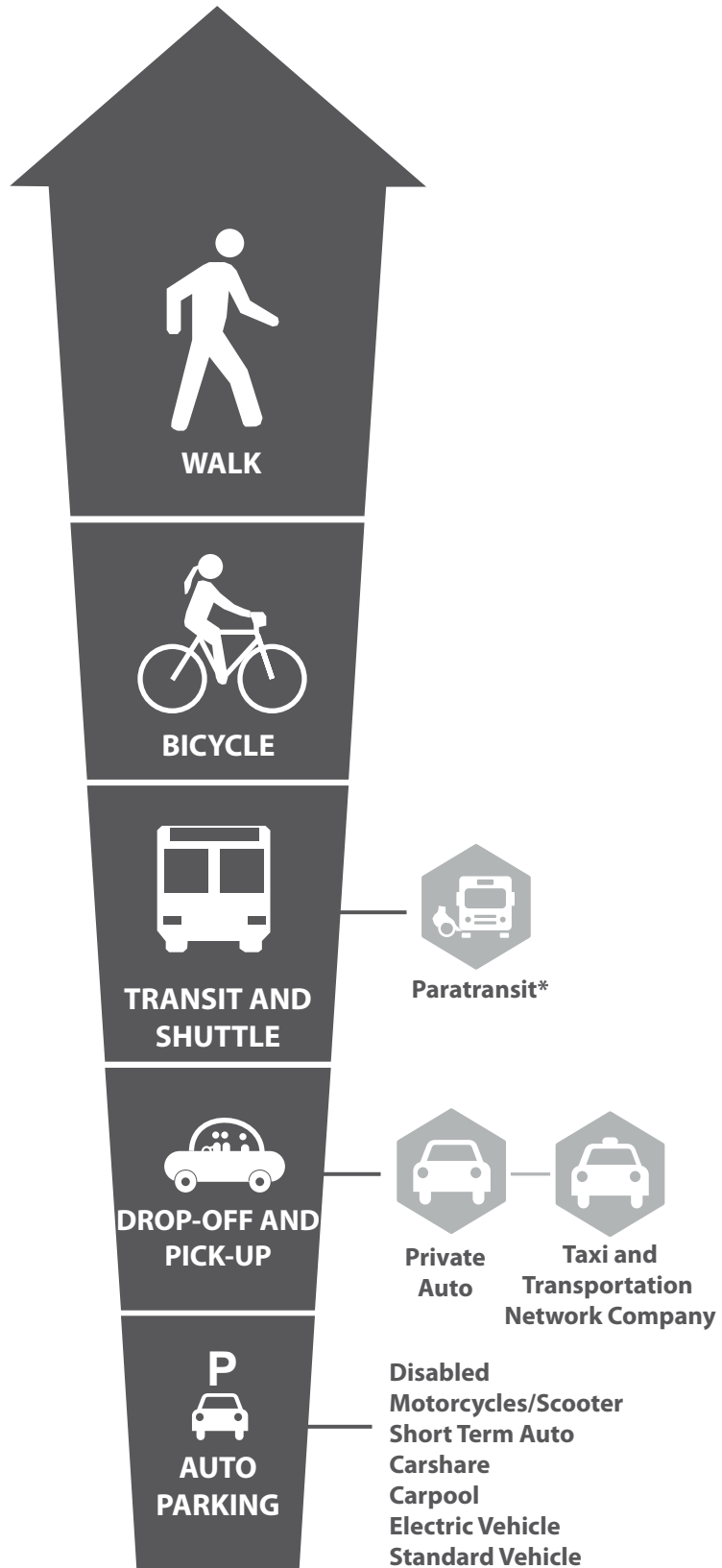
To support the Station Access Policy goal, BART has created Station Access Guidelines to describe design elements and principles that support enhanced bicycle and pedestrian access to new stations. Relevant BART Station Access Guidelines for bicycle access include the following:

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<sup>16</sup> Ibid.

<sup>17</sup> City of Livermore, 2014. City of Livermore General Plan: 2003-2025, Circulation Element. Adopted 2004, amended 2014.

<sup>18</sup> San Francisco Bay Area Rapid Transit District (BART), 2016. Station Access Policy.



Note: All stations must always remain readily accessible to and usable by persons with disabilities.  
 \*All stations must be paratransit accessible.

STATION TYPE	PRIMARY INVESTMENTS	SECONDARY INVESTMENTS	ACCOMMODATED	NOT ENCOURAGED	
URBAN	  Walk Bicycle	 Transit and Shuttle	  Taxi and TNC Drop-Off and Pick-Up	 Auto Parking*	<p><b>Primary Investment:</b>            BART will prioritize investments of funds and staff time on and off BART property, consistent with access goals; priority projects best achieve policy goals, focus on safety and sustainability.</p>
URBAN WITH PARKING	  Walk Bicycle	 Transit and Shuttle	  Taxi and TNC Drop-Off and Pick-Up	 Auto Parking*	<p><b>Secondary Investment:</b>            BART will invest funds and staff time on and off of BART property, consistent with policy goals; secondary investments balance policy goals.</p>
BALANCED INTERMODAL	  Walk Bicycle	  Transit and Shuttle Drop-Off and Pick-Up	  Taxi and TNC Auto Parking*		<p><b>Accommodated:</b>            BART will maintain and manage existing assets, and partner with other access providers as needed.</p>
INTERMODAL/AUTO RELIANT	 Walk	   Bicycle Drop-Off and Pick-Up Transit and Shuttle	  Taxi and TNC Auto Parking*		
AUTO DEPENDENT	 Walk	    Bicycle Drop-Off and Pick-Up Auto Parking* Transit and Shuttle	 Taxi and TNC		<p><b>Not Encouraged:</b>            BART will not invest in construction of parking expansion.</p>

Note: TNC is for Transportation Network Company (shared used mobility)

\*Parking management is a secondary investment at all stations with parking; Parking replacement for transit-oriented development to be determined by BART's Transit-Oriented Development Policy.

Source: BART, 2003.

Figure 3.B-8  
 Transportation  
 BART Station Access Types

- Ensure that routes to and from BART stations have bicycle lanes, if possible, or wide curb lanes at a minimum, and that all actuated traffic signals near the BART station can be activated by bicycles.
- Ensure that routes to and from BART stations are attractive to the “design bicyclist”—an inexperienced cyclist who is uncomfortable cycling on arterials with high traffic volumes, even where bicycle lanes are provided.
- Work with local jurisdictions to provide signage to the BART station from adjoining streets and bikeways.
- Work with local jurisdictions to ensure that actuated traffic signals at vehicle entrances to the BART station are bicycle-sensitive for all movements leading into and exiting the station, and that the location of bicycle-sensitive loop detectors are identified with bicycle loop detector pavement markings.
- Ensure that bicycle routes through station property minimize conflicts between bicyclists, pedestrians, automobiles, and buses. The provision of alternative routes means that cycling on the sidewalk should not be necessary. Sidewalks shall be used as bicycle routes only when no alternative options are available, and only when they have been designed to safely accommodate the expected volumes of bicycle and pedestrian traffic.
- Design parking garages to avoid major conflicts with bicycle traffic at structure entrances and exits. Where bicycle routes must cross garage entrances or exits, provide additional traffic control or calming devices to alert motorists to the bicycle crossings.
- During periods of construction, maintain direct and safe access routes from adjoining communities to the BART station.

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.<sup>19</sup>

BART has also identified pedestrian access design guidelines for its stations. The relevant guidelines are as follows:

- Wherever possible, provide multiple access routes.
- Introduce traffic calming measures as necessary to control vehicle speed in the station area.

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<sup>19</sup> San Francisco Bay Area Rapid Transit District (BART), 2012. BART Bicycle Plan, Modeling Access to Transit. Available at: [https://www.bart.gov/sites/default/files/docs/BART\\_Bike\\_Plan\\_Final\\_083012.pdf](https://www.bart.gov/sites/default/files/docs/BART_Bike_Plan_Final_083012.pdf).



- Minimize the need for wayfinding signage by providing direct line-of-sight connections along pedestrian desire lines where possible, particularly to bus stops, connecting rail platforms and parking areas.
- Pedestrians should be able to exit directly from the BART station onto the street sidewalk. Where this is not possible, pedestrian routes and crossing points should be clearly marked and be as direct as possible.
- Provide boldly marked crosswalks along routes with highest pedestrian volumes. Signalization should be considered on major streets. Signalized crosswalks should preferably include countdown-style indicators and audible signals. Median refuges should be provided where appropriate.
- Pedestrian safety should not be compromised to accommodate greater automobile volumes. Double right-turn lanes and free right-turn lanes should be avoided throughout the station area and particularly along primary pedestrian routes.
- Provide lighting at a pedestrian scale.
- Provide sidewalks that are wide enough to cater for expected pedestrian volumes, particularly around bus stops.
- All pedestrian routes that arrive at the station should continue past the BART property line to the faregates.
- Bus stops should not be located where they will block crosswalks, obstruct traffic signals or be obscured from motorists, bicyclists, and pedestrians.
- Design parking garages to avoid major conflicts with bicycle and pedestrian traffic at structure entrances and exits. Where bicycle routes must cross garage entrances/exits, provide additional traffic control or calming devices to alert motorists to the bicycle crossings.
- Pedestrian crossings of the drop-off lane should include a stop sign and a marked crosswalk, to allow pedestrians to cross easily and safely.
- Pedestrian pathways through the parking lots should be indicated with sidewalks, trees, and/or surface markings.

#### **4. Impacts and Mitigation Measures**

This subsection lists the standards of significance used to assess impacts, discusses the methodology used in the analysis, describes the analysis scenarios, summarizes the impacts, and then provides an in-depth analysis of the impacts with mitigation measures identified as appropriate.

**a. Standards of Significance**

For the purpose of this EIR, impacts on transportation are considered significant if the Proposed Project or one of the Alternatives would result in any of the following:

- Conflict with an applicable plan, ordinance, or policy that establishes measures of effectiveness for the performance of the circulation system—taking into account all modes of transportation (including mass transit and non-motorized travel) as well as relevant components of the system (e.g., intersections, streets, highways, pedestrian and bicycle paths, mass transit)
- Conflict with an applicable Congestion Management Program, including but not limited to LOS standards and travel demand measures and other standards established by the county congestion management agency for designated roads and highways
- 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
- Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)
- Result in inadequate emergency access
- Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities
- Cause a significant delay, safety hazard, or diminished access

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

**(a) Freeway Segments**

BART does not maintain its own standards of significance for freeway operations. Therefore, for this analysis, in consideration of the criteria previously used by the City of Dublin, City of Pleasanton, City of Livermore, and Alameda CTC, as well as of the current congestion conditions in the I-580 corridor, 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.

**(b) Local Roadway Intersections**

BART does not maintain its own standards of significance for intersection operations. Therefore, for this analysis, standards from the local jurisdictions are used, and the determination of significance for project intersection traffic impacts is based on applicable LOS standards defined by the City of Dublin, City of Pleasanton, and City of Livermore (depending on the individual intersection's location and jurisdiction). Performance standards for traffic for each applicable local jurisdiction are described below.

**City of Dublin**

A significant adverse impact would occur if, for either peak hour, the Proposed Project or an Alternative resulted in the following:

- An intersection operating at LOS D or better under No Project Conditions degraded to LOS E or F under Project Conditions, unless the intersection is within the boundaries of the Downtown Dublin Specific Plan.<sup>20</sup>
- An intersection operating at LOS E or F under No Project Conditions had to serve 50 or more additional vehicle trips.

**City of Pleasanton**

A significant adverse impact would occur if, in either peak hour, the Proposed Project resulted in the following:

- An intersection operating at LOS D or better under No Project Conditions degraded to LOS E or F under Project Conditions.
- An intersection operating at LOS E or F under No Project Conditions had to serve 10 or more additional vehicle trips.

Downtown intersections and the city gateway intersections are allowed to operate at an LOS worse than the LOS D standard if no reasonable mitigation exists or if the necessary mitigation is contrary to other goals and policies of the City of Pleasanton.

**City of Livermore**

An intersection impact would occur if, in either the AM or PM peak hour, the Proposed Project or an Alternative resulted in the following:

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<sup>20</sup> The Downtown Dublin Specific Plan states that LOS levels lower than D are acceptable for intersections that fall within the downtown area defined by the Specific Plan.

- An intersection operating at an acceptable mid-level LOS D or better (corresponding to an average delay of 50 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<sup>21</sup> 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.

**(c) 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 Project 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 Project or an Alternative resulted in the following:

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

**(d) Bicyclists**

There are no established criteria for the assessment of bicycle impacts. For this EIR, an impact on bicycles would occur if the Proposed Project or an Alternative performs substantially worse than No Project Conditions in the bicycle study area in terms of bicycle LTS, circulation and access, and safety hazards.

**(e) Pedestrians**

There are no established criteria for the assessment of pedestrian impacts. For this EIR, an impact on pedestrians would occur if the Proposed Project or an Alternative performs substantially worse than No Project Conditions in terms of pedestrian crossing distance at study intersections, crossing delay at study intersections, circulation and access within the study area, and safety hazards within the study area.

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<sup>21</sup> The City of Livermore General Plan identifies a total of 27 intersections near the freeway.

**(f) Construction Impacts to Transportation**

A significant impact would occur if construction activities of the Proposed Project or an Alternative resulted in a substantial delay, safety hazard, or diminished access.

**b. Impact Methodology**

The transportation analysis described in this section involved a multi-step process to generate the performance analysis metrics necessary to quantify the Proposed Project or an Alternative'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.

The EMU Option would result in the same impacts as the DMU Alternative; therefore, the analysis and conclusions for the DMU Alternative also apply to the EMU Option.

**(1) BART Ridership Forecast**

The BLVX Travel Demand Model,<sup>22</sup> a version of the Alameda CTC travel demand model customized for the BART to Livermore Extension Project, was used to forecast station-to-station origin-destination ridership for the Proposed Project and Alternatives under each analyzed scenario. These ridership forecasts were used in an operations analysis to determine peak-hour passenger loads and fleet requirements for each BART line. The average of all of the peak line loads was used to determine the systemwide peak load. The analysis used assumptions for future BART operations plans that adhered to practical constraints such as the capacity limit of the Transbay Tube, but also were designed specifically to prevent passenger peak loads on any one line from deviating substantially from the systemwide average.

Ridership and demand projections were made for multiple scenarios, as follows:

- 2025 No Project Conditions
- 2025 Project Conditions, for the Proposed Project and each Alternative
- 2025 Cumulative Conditions, for the Proposed Project and each Alternative – reflecting land use growth as summarized in Section 3.A, Introduction to Environmental Analysis
- 2040 No Project Conditions

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<sup>22</sup> Cambridge Systematics, 2017. BART to Livermore Ridership Projections (Draft). July.

- 2040 Project Conditions, for the Proposed Project and each Alternative
- 2040 Cumulative Conditions, for the Proposed Project and each Alternative – reflecting land use growth as summarized in Section 3.A, Introduction to Environmental Analysis

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

The BLVX Travel Demand Model was also used to generate the VMT differences between No Project and the Proposed Project and all of the Alternatives. The analysis forecasted total BART trips in the Tri-Valley for the opening year (2025) and horizon year (2040), including the West Dublin/Pleasanton Station, the Dublin/Pleasanton Station, and the proposed Isabel Station. Comparing total BART trips under the No Project Conditions to BART trips under the Proposed Project and Build Alternatives, the analysis determined the differences in the number of related passenger vehicle trips for 2025 and 2040. The analysis then used the model's calculation of trip distances to produce VMT reductions for the Proposed Project and Build Alternatives compared with No Project Conditions. The calculation included the following VMT differences for each scenario:

- VMT decrease from patrons traveling on BART instead of driving to their destination
- VMT increase from additional park-and-ride trips to BART
- VMT increase from additional trips to drop off or pick up BART passengers, referred to as kiss-and-ride trips
- VMT increase from ACE patrons switching to driving to the Isabel Station

## **(2) 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,<sup>23</sup> to be consistent with Alameda CTC's Congestion Management Program.<sup>24</sup> 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.

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<sup>23</sup> Transportation Research Board, 1985. Highway Capacity Manual. Transportation Research Board Special Report 209, Third Edition, Washington, DC.

<sup>24</sup> Alameda County Transportation Commission (Alameda CTC), 2015. Congestion Management Program, Chapter 3, Level of Service Standards. October.

Table 3.B-8 summarizes the LOS and V/C thresholds for freeway segments in Alameda County. Results for general-purpose lanes and high-occupancy vehicle (HOV)/express lanes are shown separately.

**TABLE 3.B-8 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.

**(3) 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.B-9. If the V/C ratio was found to exceed 1.0, regardless of the delay, the analysis assigned LOS F.

**TABLE 3.B-9 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.B-10. 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.B-10 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.

**(4) Impacts on other Transit Services**

To quantify the effect of the Proposed Project and Build Alternatives on transit operators' ability to meet their efficiency and ridership goals, the study analyzed daily ridership for key selected transit providers near the Proposed Project and Build Alternatives. The BLVX Travel Demand Model generated daily ridership forecasts for the relevant transit providers under each project scenario and alternative.

The analysis assumed modified bus service under the Proposed Project and Build Alternatives, adjusted to enable more efficient service at key BART system access points (including, for example, moving the bus transfer location from the Dublin/Pleasanton Station to the Isabel Station). Please see Chapter 2, Project Description for more details on specific route changes and bus service improvements.

**(5) Bicycles**

The analysis evaluated bikeway segments within a 15-minute bicycle ride to the proposed Isabel Station with regard to bicycle circulation and access, bicycle safety hazards, and the bicycle LTS method.

The LTS method is an evaluation model that identifies streets with high traffic stress experience by people biking in or adjacent to high vehicle traffic streets. As shown in Table 3.B-11 below, the method classifies streets and intersections from LTS 1 (suitable for children) through LTS 4 (suitable for riders who are comfortable sharing the road with automobiles traveling at 35 mph or more). Bikeways are considered low stress if they are on low-traffic/low-speed streets or, as roadways volumes and speeds increase, the



physical separation between bikeways and traffic lanes also increases, such as with bike lanes and protected bike lanes.

**TABLE 3.B-11 LEVEL OF TRAFFIC STRESS CRITERIA – BICYCLE SEGMENTS**

LTS 1	LTS 2	LTS 3	LTS 4
<ul style="list-style-type: none"> <li>▪ Physically separated from traffic or low-volume, mixed-flow traffic at 25 mph or less</li> <li>▪ Bicycle lanes 6 feet wide or more</li> <li>▪ Intersections easy to approach and cross</li> <li>▪ Comfortable for children</li> </ul>	<ul style="list-style-type: none"> <li>▪ Bicycle lanes 5.5 feet wide or less, next to 30-mph auto traffic</li> <li>▪ Unsignalized crossings of up to five lanes at 30 mph</li> <li>▪ Comfortable for most adults</li> </ul>	<ul style="list-style-type: none"> <li>▪ Bicycle lanes next to 35-mph auto traffic, or mixed-flow traffic at 30 mph or less</li> <li>▪ Comfortable for most current U.S. bicycle riders</li> </ul>	<ul style="list-style-type: none"> <li>▪ No dedicated bicycle facilities</li> <li>▪ Traffic speeds of 40 mph or more</li> <li>▪ Comfortable for vehicular cyclists</li> </ul>

Note: LTS = level of traffic stress; mph = miles per hour.  
 Source: Mineta Transportation Institute, 2012.

**(6) Pedestrians**

The analysis selected important pedestrian facilities—such as sidewalks, trails, crosswalks, and plazas—within a 15-minute walk from the proposed Isabel Station. Pedestrian conditions are evaluated compared to the No Project Conditions. The pedestrian analysis evaluated crossing distance, pedestrian delay, pedestrian access (i.e., sidewalk gaps), and potential pedestrian safety hazards (i.e., uncontrolled crossings of vehicle traffic).

For pedestrian crossing delay, the analysis used the Transportation Research Board HCM 2000 methodology, with LOS delay thresholds, as shown in Table 3.B-12 below.

**c. No Project Conditions**

This subsection describes the future year No Project Conditions for the opening year (2025) and the horizon year (2040) for the freeway segments, local roadway intersections, transit, bicycles, and pedestrians. Please see Section 3.A, Introduction to Environmental Analysis, for more detail on the purpose and use of the No Project Conditions.

**TABLE 3.B-12 PEDESTRIAN DELAY THRESHOLDS FOR SIGNALIZED INTERSECTIONS**

Level of Service	Average Delay in Seconds
A	< 10
B	10.1-20
C	20.1-30
D	30.1-40
E	40.1-60
F	> 60

Source: Transportation Research Board, 2000.

**(1) Freeway Segments**

This section summarizes the known completed and planned improvements for I-580 between 2014 and 2025 and 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.B-13 shows the freeway configuration for I-580 for 2014 and 2025/2040.

**TABLE 3.B-13 I-580 LANE CONFIGURATION IN 2014 AND 2025/2040, NO PROJECT CONDITIONS**

#	To	From	2014				2025/2040			
			General Purpose Lanes		2014 Express Lanes		General Purpose Lanes		2025/2040 Express Lanes	
			WB	EB	WB	EB	WB	EB	WB	EB
1	Dougherty Road/Hopyard Road	Hacienda Drive	5	7	0	0	5	7	1	0
2	Hacienda Drive	Tassajara Road/Santa Rita Road	5	5	0	1	5	5	1	1
3	Tassajara Road/Santa Rita Road	Fallon Road/El Charro Road	5	5	0	1	5	5	1	1
4	Fallon Road/El Charro Road	Airway Boulevard	4	5	0	1	5	5	1	2
5	Airway Boulevard	Isabel Avenue	4	5	0	1	5	5	1	2
6	Isabel Avenue	Livermore Avenue	4	4	0	1	5	5	1	2
7	Livermore Avenue	Springtown Boulevard/First Street	4	4	0	1	5	5	1	2
8	Springtown Boulevard/First Street	Vasco Road	4	5	0	1	5	5	1	2
9	Vasco Road	Greenville Road	4	4	0	1	4	4	1	1
10	Greenville Road	Carroll Road/Flynn Road	4	4	0	0	4	5	0	0

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, 2016.

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.

**(a) No Project 2025 Conditions**

Tables 3.B-14 and 3.B-15 presents freeway LOS results for 2025, for general-purpose and HOT/express lanes. 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

TABLE 3.B-14 I-580 PERFORMANCE IN AM, 2025 NO PROJECT CONDITIONS

#	To	From	General-Purpose Westbound		General-Purpose Eastbound		Express Lane Westbound		Express Lane Eastbound	
			LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C
1	Dougherty Road/Hopyard Road	Hacienda Drive	E	0.97	B	0.47	E	0.98	N/A	N/A
2	Hacienda Drive	Tassajara Road/Santa Rita Road	<b>F</b>	<b>1.00</b>	B	0.53	<b>F</b>	<b>1.01</b>	A	0.29
3	Tassajara Road/Santa Rita Road	Fallon Road/El Charro Road	<b>F</b>	<b>1.00</b>	B	0.57	<b>F</b>	<b>1.02</b>	A	0.29
4	Fallon Road/El Charro Road	Airway Boulevard	E	0.97	B	0.55	E	0.99	A	0.15
5	Airway Boulevard	Isabel Avenue	<b>F</b>	<b>1.04</b>	B	0.49	<b>F</b>	<b>1.04</b>	A	0.15
6	Isabel Avenue	Livermore Avenue	<b>F</b>	<b>1.05</b>	B	0.54	<b>F</b>	<b>1.06</b>	A	0.15
7	Livermore Avenue	Springtown Boulevard/First Street	E	0.98	B	0.52	E	0.99	A	0.15
8	Springtown Boulevard/First Street	Vasco Road	E	0.98	B	0.57	E	0.98	A	0.15
9	Vasco Road	Greenville Road	D	0.87	B	0.51	D	0.87	A	0.00
10	Greenville Road	Carroll Road/Flynn Road	<b>F</b>	<b>1.04</b>	B	0.44	N/A	N/A	N/A	N/A

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: Cambridge Systematics, 2017.

**TABLE 3.B-15 I-580 PERFORMANCE IN PM, 2025 NO PROJECT CONDITIONS**

#	To	From	General-Purpose Westbound		General-Purpose Eastbound		Express Lane Westbound		Express Lane Eastbound	
			LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C
1	Dougherty Road/Hopyard Road	Hacienda Drive	C	0.63	C	0.71	B	0.45	N/A	N/A
2	Hacienda Drive	Tassajara Road/Santa Rita Road	C	0.63	D	0.90	B	0.45	D	0.83
3	Tassajara Road/Santa Rita Road	Fallon Road/ El Charro Road	C	0.66	E	0.95	B	0.47	D	0.85
4	Fallon Road/ El Charro Road	Airway Boulevard	C	0.62	E	0.97	B	0.47	B	0.44
5	Airway Boulevard	Isabel Avenue	B	0.55	E	0.95	B	0.43	B	0.40
6	Isabel Avenue	Livermore Avenue	C	0.64	<b>F</b>	<b>1.04</b>	B	0.42	B	0.40
7	Livermore Avenue	Springtown Boulevard/ First Street	B	0.51	E	0.92	B	0.37	B	0.40
8	Springtown Boulevard/ First Street	Vasco Road	C	0.59	D	0.90	B	0.36	B	0.36
9	Vasco Road	Greenville Road	B	0.51	D	0.79	A	0.18	C	0.62
10	Greenville Road	Carroll Road/ Flynn Road	C	0.60	D	0.82	N/A	N/A	N/A	N/A

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: Cambridge Systematics, 2017.

peak period and lighter volumes in the PM peak period; the eastbound direction has the inverse trend. These trends reflect land use and commute patterns, with AM travelers going from points east to employment centers in the west such as San Francisco and Silicon Valley, and then returning in the PM peak period. HOT/express lanes reflect similar trends, with performance falling to LOS E and F in the peak direction and period, based on the forecasted increase in vehicle occupancy trends with two-occupant vehicles expected to take up much of the HOT/express lane capacity by 2025.

**(b) No Project 2040 Conditions**

Tables 3.B-16 and 3.B-17 show freeway LOS results under 2040 No Project Conditions. 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 HOT policy assumption from two occupants to three occupants. The number of forecasted three-occupant vehicles is sufficiently low that HOT/express lane performance improves to LOS A or B.

**(2) Local Roadway Intersections**

Multiple local roadway network improvements are planned within Livermore, Dublin, and Pleasanton by 2025 and 2040. The Livermore General Plan specifies improvements for local highway segments and interchanges and details roadway segments and intersections requiring improvement in the future, as described in Table 3.B-18 and in the text below. The Livermore General Plan also details how truck routes in the area will be affected by upcoming construction.

TABLE 3.B-16 I-580 PERFORMANCE IN AM, 2040 NO PROJECT CONDITIONS

#	To	From	General-Purpose Westbound		General-Purpose Eastbound		Express Lane Westbound		Express Lane Eastbound	
			LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C
1	Dougherty Road/Hopyard Road	Hacienda Drive	E	0.98	B	0.55	B	0.47	N/A	N/A
2	Hacienda Drive	Tassajara Road/Santa Rita Road	<b>F</b>	<b>1.00</b>	C	0.65	B	0.45	A	0.19
3	Tassajara Road/Santa Rita Road	Fallon Road/ El Charro Road	<b>F</b>	<b>1.02</b>	C	0.67	B	0.45	A	0.20
4	Fallon Road/El Charro Road	Airway Boulevard	E	0.99	C	0.65	B	0.44	A	0.10
5	Airway Boulevard	Isabel Avenue	<b>F</b>	<b>1.06</b>	C	0.59	B	0.40	A	0.10
6	Isabel Avenue	Livermore Avenue	<b>F</b>	<b>1.10</b>	C	0.63	B	0.40	A	0.10
7	Livermore Avenue	Springtown Boulevard/ First Street	<b>F</b>	<b>1.03</b>	C	0.63	B	0.38	A	0.10
8	Springtown Boulevard/First Street	Vasco Road	<b>F</b>	<b>1.04</b>	D	0.77	A	0.35	A	0.10
9	Vasco Road	Greenville Road	E	0.95	C	0.60	A	0.28	A	0.17
10	Greenville Road	Carroll Road/ Flynn Road	<b>F</b>	<b>1.06</b>	B	0.57	N/A	N/A	N/A	N/A

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: Cambridge Systematics, 2017.

TABLE 3.B-17 I-580 PERFORMANCE IN PM, 2040 NO PROJECT CONDITIONS

#	To	From	General-Purpose Westbound		General-Purpose Eastbound		Express Lane Westbound		Express Lane Eastbound	
			LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C
1	Dougherty Road/Hopyard Road	Hacienda Drive	C	0.75	C	0.68	A	0.21	N/A	N/A
2	Hacienda Drive	Tassajara Road/Santa Rita Road	D	0.76	E	0.94	A	0.22	A	0.23
3	Tassajara Road/Santa Rita Road	Fallon Road/ El Charro Road	D	0.78	E	0.98	A	0.22	A	0.24
4	Fallon Road/ El Charro Road	Airway Boulevard	D	0.75	E	0.97	A	0.22	A	0.13
5	Airway Boulevard	Isabel Avenue	C	0.66	E	0.99	A	0.20	A	0.12
6	Isabel Avenue	Livermore Avenue	D	0.77	<b>F</b>	<b>1.08</b>	A	0.20	A	0.13
7	Livermore Avenue	Springtown Boulevard/ First Street	C	0.74	<b>F</b>	<b>1.01</b>	A	0.18	A	0.12
8	Springtown Boulevard/ First Street	Vasco Road	D	0.83	<b>F</b>	<b>1.02</b>	A	0.17	A	0.11
9	Vasco Road	Greenville Road	C	0.69	D	0.85	A	0.13	A	0.17
10	Greenville Road	Carroll Road/ Flynn Road	D	0.75	D	0.82	N/A	N/A	N/A	N/A

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: Cambridge Systematics, 2017.



**TABLE 3.B-18 LOCAL ROADWAY IMPROVEMENTS, 2025 AND 2040 NO PROJECT CONDITIONS**

Street	Limits	Improvement	Relevant Analysis Year	Relevant Study Intersection #
<b>Livermore</b>				
Isabel Avenue	I-580 EB Ramps	Widen overpass	2040	#30
Isabel Avenue	I-580 WB Ramps	Widen overpass	2025 and 2040	#28 and #29
Isabel Avenue	Stanley Boulevard to Ruby Hill Drive	Widen to four lanes	2040	#33
Isabel Avenue	Isabel and Jack London Boulevard	Intersection improvements	2025 and 2040	#36
Vasco Road	Northfront Road to Las Positas Road	Widen to eight lanes	2040	#43 and #44
Greenville Road	Interchange improvements	Widen underpass to six lanes	2025 and 2040	#48
Greenville Road	Las Positas Road to Paterson Pass Road	Widen to four lanes	2025 and 2040	#48
Greenville Road	Westbound ramp	Signalize intersection and add westbound left-turn pocket and eastbound right-turn pocket	2025 and 2040	#46
Greenville Road	Greenville Road and Altamont Pass Road	Signalize intersection	2025 and 2040	#48
Greenville Road	Greenville Road and Patterson Pass Road	Signalize intersection	2025 and 2040	#50
<b>Pleasanton</b>				
El Charro Road	Stoneridge Drive to Jack London Boulevard	Extension	2040	#23
El Charro Road	Jack London to Stanley Boulevard	Extension	After 2040	N/A
<b>Dublin</b>				
Dublin Boulevard	Brannigan Street to Fallon Road	Widen to eight lanes	2025 and 2040	#19
Dublin Boulevard	Dougherty Road to North Canyons Parkway	Extension	2040	N/A
Fallon Road	Connect to Tassajara Road	Extension	2040	N/A
Gleason Drive	To Fallon Road	Extension	2040	N/A
Fallon Road Interchange	N/A	Upgrade	2040	#20
Dublin Boulevard	To Schaefer Ranch Road	Extension	2040	N/A

**TABLE 3.B-18 LOCAL ROADWAY IMPROVEMENTS, 2025 AND 2040 NO PROJECT CONDITIONS**

<b>Street</b>	<b>Limits</b>	<b>Improvement</b>	<b>Relevant Analysis Year</b>	<b>Relevant Study Intersection #</b>
Tassajara Road	Dublin Boulevard to I-580	Widen to eight lanes	2025 and 2040	#14
Tassajara Road	Fallon to Dublin	Widen to six lanes	2040	#14
Hacienda Road	Dublin Boulevard to Central Parkway	Widen to six lanes	2040	#9
Dougherty Road	Sierra Court to City Limits	Widen to eight lanes	2025 and 2040	#1

Notes: EB = eastbound; WB = westbound; N/A = not applicable.

Local roadway improvement assumptions were made with input from the Cities of Livermore, Dublin, and Pleasanton.

Sources:

City of Livermore, 2009; City of Pleasanton, 2009; City of Dublin, 2013.

The Pleasanton General Plan has identified major roadway improvements. Table 3.B-18 summarizes the intersection and roadway lane improvements near the study area. Completion of the Stoneridge Drive extension, Busch Road, and El Charro Road are significant and necessary parts of Pleasanton’s local circulation system. The extension of Nevada Street has the potential to provide some traffic relief to the Stanley Boulevard/Valley Avenue/Bernal Avenue intersection.

In addition to these improvements, the Triangle Study<sup>25</sup> identified projects required for a strategic approach to relieving traffic congestion in the Tri-Valley Area. The Tri-Valley Triangle Study Final Plan Recommendations were approved in February 2011. This included an agreement on the sequencing of projects, specifically that the Stoneridge Drive extension be completed before construction can begin on State Route 84 as a four-lane facility between west of Ruby Hill Drive and I-680.

Table 3.B-19 presents the No Project Conditions in 2025 and 2040.

<sup>25</sup> Alameda County Transportation Commission (Alameda CTC), 2007. Tri-Valley Triangle Study.

**TABLE 3.B-19 LOCAL ROADWAY INTERSECTION PERFORMANCE, 2025 AND 2040 NO PROJECT CONDITIONS**

#	Intersection	2025 No Project AM		2025 No Project PM		2040 No Project AM		2040 No Project PM	
		Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
1	Dougherty Road & Amador Valley Road	30.4	C	35.0	D	98.1	F	32.6	C
2	Hopyard Road/Dougherty Road & Dublin Boulevard	43.5	D	106.9	F	101.6	F	147.9	F
3	Dougherty Road/Hopyard Road & I-580 WB Ramps	11.0	B	17.4	B	18.1	B	19.1	B
4	Hopyard Road/Dougherty Road & I-580 EB Ramps	37.8	D	33.5	C	42.5	D	46.3	D
5	Hopyard Road & Owens Road	33.0	C	108.7	F	32.1	C	100.7	F
6	Hopyard Road & Stoneridge Drive	30.1	C	37.0	D	32.4	C	39.3	D
7	Hopyard Road & Las Positas Boulevard	24.1	C	27.2	C	25.9	C	32.4	C
8	Willow Road & Owens Road	11.7	B	22.7	C	12.4	B	22.4	C
9	Hacienda Drive & Dublin Boulevard	24.0	C	29.1	C	37.4	D	31.7	C
10	Hacienda Drive & Martinelli Boulevard/Hacienda Crossings	19.2	B	25.5	C	20.2	C	28.8	C
11	Hacienda Drive & I-580 WB Ramps	7.4	A	8.5	A	7.7	A	8.9	A
12	Hacienda Drive & I-580 EB Ramps	17.4	B	20.3	C	18.9	B	20.7	C
13	Hacienda Drive & Owens Road	27.5	C	32.5	C	23.4	C	30.5	C
14	Tassajara Road & Dublin Boulevard	43.0	D	42.0	D	50.5	D	46.2	D
15	Tassajara Road & I-580 WB Ramps	8.8	A	9.5	A	11.5	B	11.8	B
16	Santa Rita Road & I-580 EB Ramps/Pimlico Drive	17.8	B	30.6	C	19.5	B	32.8	C
17	Santa Rita Road & Valley Avenue	21.7	C	45.8	D	24.0	C	77.5	E
18	Bernal Avenue/Valley Avenue & Stanley Boulevard	37.4	D	32.8	C	38.5	D	32.6	C

**TABLE 3.B-19 LOCAL ROADWAY INTERSECTION PERFORMANCE, 2025 AND 2040 NO PROJECT CONDITIONS**

#	Intersection	2025 No Project AM		2025 No Project PM		2040 No Project AM		2040 No Project PM	
		Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
19	Fallon Road & Dublin Boulevard/Croak Road	48.2	D	21.4	C	35.1	D	30.1	C
20	El Charro Road/Fallon Road & I-580 WB Ramps	8.0	A	9.4	A	10.8	B	9.5	A
21	El Charro Road & I-580 EB Ramps	8.2	A	8.2	A	11.3	B	12.0	B
22	El Charro Road & Stoneridge Drive/Jack London Boulevard	26.8	C	18.3	B	26.5	C	28.6	C
23	Stanley Boulevard & El Charro Road	N/A <sup>a</sup>	N/A <sup>a</sup>	N/A <sup>a</sup>	N/A <sup>a</sup>	38.9	D	31.6	C
24	Airway Boulevard/Driveway & North Canyons Parkway	78.7	E	13.6	B	98.8	F	35.7	D
25	Airway Boulevard & I-580 WB Ramps	20.8	C	5.4	A	16.4	B	5.5	A
26	Airway Boulevard & I-580 EB Ramps/Kitty Hawk Road	28.6	C	27.9	C	30.8	C	39.4	D
27	Collier Canyon Road & North Canyons Parkway/Portola Avenue	22.9	C	25.6	C	24.0	C	22.3	C
28	Isabel Avenue/Campus Hill Drive & Portola Avenue	27.9	C	25.0	C	27.7	C	27.5	C
29	Isabel Avenue & I-580 WB Ramps	10.8	B	9.9	A	11.5	B	14.4	B
30	Isabel Avenue & I-580 EB Ramps	6.6	A	6.6	A	6.1	A	6.4	A
31	Isabel Avenue & Airway Boulevard	26.7	C	31.7	C	34.3	C	36.4	D
32	Isabel Avenue & Jack London Boulevard	37.1	D	43.1	D	50.6	D	79.8	E
33	Isabel Avenue Connector & Stanley Boulevard	15.7	B	15.8	B	40.5	D	73.8	E
34	Murrieta Boulevard/Driveway & Portola Avenue	14.1	B	20.2	C	14.5	B	33.7	C
35	Murrieta Boulevard & Jack London Boulevard	17.9	B	20.5	C	25.0	C	100.7	F
36	Murrieta Boulevard & Stanley Boulevard	40.3	D	29.3	C	98.3	F	45.8	D

**TABLE 3.B-19 LOCAL ROADWAY INTERSECTION PERFORMANCE, 2025 AND 2040 NO PROJECT CONDITIONS**

#	Intersection	2025 No Project AM		2025 No Project PM		2040 No Project AM		2040 No Project PM	
		Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
37	Livermore Avenue & I-580 WB Ramps	21.4	C	39.3	D	23.5	C	27.8	C
38	Livermore Avenue & I-580 EB Ramps	17.5	B	<b>108.2</b>	<b>F</b>	17.5	B	<b>74.3</b>	<b>E</b>
39	Livermore Avenue & Portola Avenue	39.3	D	37.3	D	43.8	D	<b>52.6</b>	<b>D</b>
40	First Street/Springtown Boulevard & I-580 WB Ramps	16.3	B	7.5	A	16.3	B	14.1	B
41	First Street & I-580 EB Ramps	9.8	A	30.4	C	14.5	B	<b>47.1</b>	<b>D</b>
42	First Street & Mines Road	24.2	C	<b>48.6</b>	<b>D</b>	26.2	C	<b>52.1</b>	<b>D</b>
43	Vasco Road/I-580 WB Ramps	1.0	A	1.1	A	0.7	A	1.7	A
44	Vasco Road/I-580 EB Ramps	0.3	A	0.7	A	N/A <sup>b</sup>	N/A <sup>b</sup>	N/A <sup>b</sup>	N/A <sup>b</sup>
45	Vasco Road & East Avenue	18.8	B	42.2	D	20.9	C	<b>87.4</b>	<b>F</b>
46	Altamont Pass Road /Greenville Road & I-580 WB Ramps	<b>123.8</b>	<b>F</b>	7.0	A	8.8	A	5.3	A
47	Southfront Road/ Greenville Road & I-580 EB Ramps	10.0	A	13.8	B	4.2	A	9.2	A
48	Greenville Road/Altamont Pass Road	35.1	D	<b>79.8</b>	<b>E</b>	7.1	A	<b>96.1</b>	<b>F</b>
49	Greenville Road & Southfront Road	8.9	A	14.2	B	14.3	B	13.9	B
50	Greenville Road/ Patterson Pass Road	<b>61.7</b>	<b>E</b>	<b>132.2</b>	<b>F</b>	40.6	D	<b>156.3</b>	<b>F</b>

Notes: LOS = level of service; EB = eastbound; WB = westbound; N/A = not applicable.

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

<sup>a</sup> Future planned intersection, to be constructed by 2040, with extension of El Charro Road to Stanley Boulevard.

<sup>b</sup> Intersection to be eliminated in 2040 with planned interchange reconfiguration.

Source: Cambridge Systematics, 2017.

In 2025, intersection operations are expected to worsen compared with Existing Conditions, the result of projected land use growth in the study area. Under 2025 No Project Conditions, the following ten intersections would operate at unacceptable levels:

- Hopyard Road/Dougherty Road & Dublin Boulevard (Intersection #2)
- Hopyard Road & Owens Road (Intersection #5)
- Santa Rita Road & Valley Avenue (Intersection #17)
- Fallon Road & Dublin Boulevard/Croak Road (Intersection #19)
- Airway Boulevard/Driveway & North Canyons Parkway (Intersection #24)
- Livermore Avenue & I-580 EB Ramps (Intersection #38)
- First Street & Mines Road (Intersection #42)
- Altamont Pass Road/Greenville Road & I-580 WB Ramps (Intersection #46)
- Greenville Road/Altamont Pass Road (Intersection #48)
- Greenville Road/Patterson Pass Road (Intersection #50)

In 2040, intersection operations are expected to worsen even further with projected growth in the study area. Under 2040 No Project Conditions, the following 16 intersections would operate at unacceptable levels:

- Dougherty Road & Amador Valley Road (Intersection #1)
- Hopyard Road/Dougherty Road & Dublin Boulevard (Intersection #2)
- Hopyard Road & Owens Road (Intersection #5)
- Santa Rita Road & Valley Avenue (Intersection #17)
- Airway Boulevard/Driveway & North Canyons Parkway (Intersection #24)
- Isabel Avenue & Jack London Boulevard (Intersection #32)
- Isabel Avenue Connector & Stanley Boulevard (Intersection #33)
- Murrieta Boulevard & Jack London Boulevard (Intersection #35)
- Murrieta Boulevard & Stanley Boulevard (Intersection #36)
- Livermore Avenue & I-580 EB Ramps (Intersection #38)
- Livermore Avenue & Portola Avenue (Intersection #39)
- First Street & I-580 EB Ramps (Intersection #41)
- First Street & Mines Road (Intersection 42)
- Vasco Road & East Avenue (Intersection #45)
- Greenville Road/Altamont Pass Road (Intersection #48)
- Greenville Road/Patterson Pass Road (Intersection #50)

### **(3) Transit**

#### **(a) BART**

BART has outlined several near-term and long-term major investments to increase its ability to meet demand by providing more trains and more service. BART's Transbay Core

Capacity project will reduce crowding and improve service with the following four elements:

- Fleet of the Future – Expansion of BART's current fleet from 669 cars to as many as 1116 cars
- Train Control Modernization Project – An updated train control system that will allow BART to run trains more frequently and reliably
- Hayward Maintenance Complex – To ensure that BART has sufficient capacity to repair and maintain fleet for its expanded system
- Traction Power Improvements – Upgrading or installation of five traction power substations serving the congested corridor to adequately power additional BART service

Together, these projects will allow BART to run up to 30 trains per hour per direction through the Transbay Tube to alleviate the existing pinch point and increase capacity from the current 24,000 to 35,000 passengers per hour per direction. At some point after 2025, BART intends to improve weekday train headways from 15 minutes to 12 minutes, which will be in effect by 2040.

In addition, BART and its project partners are in the process of advancing several system extension projects, including the BART to Silicon Valley Extension Project (extension from Fremont to Berryessa in north San Jose) and the East Contra Costa County Extension Project, known as eBART (extension from Pittsburg/Bay Point to Antioch). BART is also implementing improvements at several stations.

#### **(b) Other Transit**

This EIR uses a programmatic approach to address future LAVTA bus service. To accurately estimate ridership, travel, and related impacts resulting from the Proposed Project, the EIR analysis made assumptions that represent potential future LAVTA bus service to support passenger access from key study area destinations to BART. Assumed bus service plans under future No Project Conditions are the same as under Existing Conditions.

LAVTA is the local bus service provider for connecting routes. LAVTA's Short Range Transit Plan highlights several initiatives that include tailoring transit service to be responsive to local land use, eliminating or reducing service along inefficient routes, exploring express and rapid service options, and increasing the service frequency and coverage along the most productive routes. LAVTA is also in the process of planning and implementing improvements to its bus stop locations to better address safety concerns, Americans With Disabilities Act issues, and accessibility. Finally, LAVTA recently

implemented its Wheels Forward Plan—a framework designed to help the agency achieve the above summarized goals by strategically modifying its service.<sup>26</sup>

At the route level, these analysis assumptions differ from the route modifications proposed under the Wheels Forward Plan. Despite these route-specific differences, the future bus service assumptions provide similar systemwide bus service coverage and operations to Wheels Forward, albeit under different route names.

Under 2025 and 2040 No Project Conditions, the analysis assumed that other surrounding transit service would remain identical to existing conditions.

In the future, the surrounding transit services are expected to experience ridership gains, due to land use growth in the region. ACE ridership within the Bay Area and San Joaquin County is expected to increase by 20 percent from 2013 to 2025, and another 20 percent from 2025 to 2040 (see Table 3.B-20). The greatest increases are expected for LAVTA bus routes—80 percent from 2013 to 2025 and another 40 percent from 2025 to 2040.

ACE is currently conducting environmental review of its ACEforward program, which is a series of improvement projects and service upgrades to be implemented through 2022. The following two phases of the ACEforward program are included in the BLVX transportation analysis. The first phase of ACE improvements includes the extension of service to Modesto, and would increase daily round trips to San Jose from four trains to six. The second phase improvements would include extension of service to Merced and the expansion of service to 10 round-trip trains daily.

The ACEforward Draft EIR also includes ridership projections for the ACE system in 2025 and 2040. These projections differ from the values shown in Table 3.B-20 because different ridership forecasting methodologies were used in the BART to Livermore Extension and ACEforward Draft EIRs. Whereas the primary focus of the BART to Livermore Extension ridership analysis is on BART ridership, the primary focus of the ACEforward ridership analysis is on ACE ridership.

#### **(4) Bicycles and Pedestrians**

Planned on-street bicycle facilities as defined at the city, county, and/or regional level in the vicinity of the proposed station sites are identified below:

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<sup>26</sup> Livermore Amador Valley Transit Authority (LAVTA), 2016. Existing Schedules. Available at: <http://www.wheelsbus.com/routes-and-schedules/>.



**TABLE 3.B-20 SURROUNDING TRANSIT SERVICES RIDERSHIP (WEEKDAY BOARDINGS), EXISTING AND 2025/2040 NO PROJECT CONDITIONS**

	2013	2025	2040
ACE	4,700	5,600	6,900
LAVTA	5,700	10,400	14,700
RTD	180 <sup>a</sup>	360	340

Notes: ACE = Altamont Corridor Express; LAVTA = Livermore-Amador Valley Transit Authority; RTD = San Joaquin Regional Transit District.

ACE ridership numbers only include boardings in San Joaquin County and the Bay Area. These numbers do not reflect boarding along potential future ACE extensions into Stanislaus and Merced Counties. 2013 data shown in the table are output from the BLVX Travel Demand Model intended to reflect existing conditions.

<sup>a</sup> RTD has indicated that the current ridership is 225.

Source: Cambridge Systematics, 2017.

- Olivina Avenue – Infill of a short segment of bicycle lanes between Hageman Drive and Murrieta Boulevard
- East Airway Boulevard – Eastern extension of bicycle lane from Isabel Avenue to Rutan Drive

The City of Livermore is currently updating its 2001 Bikeways and Trails Master Plan. The updated plan—called the Bicycle, Pedestrian, and Trails Active Transportation Plan—will call for several proposed bicycle facility improvements within the study area, including proposed Class II lane extensions at the following locations:

- Airway Boulevard between Isabel Avenue and Portola Avenue
- North Canyons Parkway to Dublin Boulevard
- Constitution Drive connection to North Canyons Parkway
- Collier Canyon Road north of Campus Loop
- Isabel Avenue along Campus Hill Drive, providing a connection to the proposed North Livermore Connector Trail

The plan will also call for extensive updates to the Class I bike trail network within the study area, as follows:

- Filling in crucial gaps along the Isabel Trail
- Extending the trail along North Canyons Parkway
- Extension of the College Trail near Las Positas College
- New trail networks along Doolan Road, the North Livermore Connector Trail, and the Cayetano Creek Trail

Planned trails in the study area that would provide bicycle and pedestrian access in the vicinity of the proposed Isabel Station are as follows:

- Jack London Trail – Extension of the proposed Jack London Trail from Isabel Parkway east along Jack London Boulevard and then north to connect ultimately with the Las Positas Trail
- Arroyo Mocho Trail – Extension of existing trail along El Charro Road from south of I-580 to Isabel Avenue in the city of Livermore connecting to the Isabel Station site
- Cayetano Creek Trail – Segment in the city of Livermore along the tributary of Las Positas Creek from Portola Avenue to I-580

**d. BART System Performance in 2025 and 2040 under Project Conditions**

This section describes BART system performance under the Proposed Project and Build Alternatives in the opening year (2025) and horizon year (2040). Quantitative metrics of BART system performance discussed here include ridership levels and station access mode trends, passenger loads, fleet requirements, and BART station parking.

The 2025 BART Operations Plan used in this analysis assumes the completion of near-term and long-term investments outlined under No Project Conditions and assumes that the BART extensions from Pittsburg/Bay Point to Antioch (eBART) and from Fremont to Berryessa (north San Jose) will be in service.<sup>27</sup> In addition, the 2040 BART Operation Plan and Plan Bay Area assume that the full BART extension beyond Berryessa to the city of Santa Clara will be in service.<sup>28, 29</sup> Future BART service will run more frequently systemwide, with 10-car trains running on each line at 15-minute headways (i.e., one train every 15 minutes) in 2025 and at 12-minute headways in 2040 in the peak direction during the peak period, along with additional rush hour trains along some routes.

**(1) Ridership, Station Access, and Reductions in Vehicle Miles Traveled**

This section describes BART system ridership, Tri-Valley ridership and station access modes, and reductions in VMT attributable to implementation of the Proposed Project and Build Alternatives.

Table 3.B-21 summarizes estimates current daily ridership in 2013, as well as under 2025 and 2040 Project Conditions. Systemwide ridership is expected to grow 18 percent from

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<sup>27</sup> San Francisco Bay Area Rapid Transit District (BART), 2016. Station Access Policy.

<sup>28</sup> Ibid.

<sup>29</sup> Association of Bay Area Governments (ABAG) and Metropolitan Transportation Commission (MTC), 2013. Plan Bay Area 2013. Available at: [http://files.mtc.ca.gov/pdf/Plan\\_Bay\\_Area\\_FINAL/Plan\\_Bay\\_Area.pdf](http://files.mtc.ca.gov/pdf/Plan_Bay_Area_FINAL/Plan_Bay_Area.pdf)

2013 to 2025, and then to accelerate to nearly 40 percent from 2025 to 2040, a trend that reflects land use growth expectations and an extension of the BART system to the cities of San Jose and Santa Clara.

**TABLE 3.B-21 BART SYSTEMWIDE DAILY RIDERSHIP (WEEKDAY), EXISTING AND 2025/2040**

Year	No Project	Conventional BART Project	DMU Alternative	Express Bus/BRT Alternative	Enhanced Bus Alternative
2013 Existing Conditions	400,400	N/A	N/A	N/A	N/A
2025 Conditions	472,200	478,800 (+6,600)	477,200 (+5,000)	473,900 (+1,700)	472,200 (+0)
2025 Cumulative Conditions	--	479,600 (+7,400)	478,000 (+5,800)	475,100 (+2,900)	474,000 (+1,800)
2040 Conditions	657,300	669,200 (+11,900)	664,300 (+7,000)	660,800 (+3,500)	657,700 (+400)
2040 Cumulative Conditions	--	670,700 (+13,400)	665,600 (+8,300)	662,100 (+4,800)	659,100 (+1,800)

Notes: -- = Not Modeled; N/A = not applicable.  
 Ridership refers to the number of linked trips on the BART system; a theoretical passenger boarding the Dublin/Pleasanton-Daly City line at the Dublin/Pleasanton Station and transferring to the Richmond-Fremont line at the Coliseum Station would count as one trip.  
 Values in parentheses indicate change from No Project. Positive values indicate increase.  
 2013 data shown in the table are output from the BLVX Travel Demand Model intended to reflect existing conditions.  
 Source: Cambridge Systematics, 2017.

The Proposed Project results in the highest systemwide ridership in both 2025 and 2040, reflecting the relatively high appeal of a direct connection to the BART system from the Isabel area that eliminates the need for additional transfers. In 2040 the Proposed Project generates 11,900 more BART trips than would occur without the project. The DMU Alternative is less attractive as a rail option due to the required transfer at the Dublin/Pleasanton Station, and adds fewer new trips (7,000) in 2040. The Express Bus/BRT Alternative adds even fewer trips (3,500). While the express lane on I-580 and the proposed bus-only ramps enable faster travel times than buses traveling with other traffic, the bus service is still less attractive than rail and requires a transfer at the Dublin/Pleasanton Station for entrance into the BART system. Finally, the Enhanced Bus Alternative generates the fewest additional trips (400), a reflection of the lower reliability and speed of bus service on surface streets compared with exclusive travel-ways. Ridership comparisons of different alternatives for 2025 yield similar trends to those for 2040.

As described in Section 3.A, Introduction to Environmental Analysis, cumulative scenarios for 2025 and 2040 feature the Dublin/Pleasanton Station Parking Expansion, and for the Proposed Project and DMU Alternative, transit-oriented development that increases both housing and employment around the proposed Isabel Station, under the Isabel Neighborhood Plan (INP). These two changes cause the cumulative scenarios to produce higher BART ridership than the corresponding project scenarios. For instance, the Proposed Project generates 13,400 net new BART trips, or 1,500 more when cumulative projects are considered. The same trend applies to all alternatives in both 2025 and 2040.

Ridership effects of the Proposed Project and Build Alternatives are largely focused in the Tri-Valley Area. Table 3.B-22 shows the number of daily boardings for all alternatives, under 2025 and 2040 Project and Cumulative Conditions at the West Dublin/Pleasanton Station, the Dublin/Pleasanton Station, and the proposed Isabel Station, and total number of boardings for the Tri-Valley Area.

**TABLE 3.B-22 TRI-VALLEY BART BOARDINGS (WEEKDAY), EXISTING AND 2025/2040**

	West Dublin/ Pleasanton	Dublin/ Pleasanton	Proposed Isabel Station	Total Tri-Valley
<b>Existing (2013)</b>				
	3,000	7,300	N/A	10,300
<b>2025</b>				
No Project Conditions	3,100	8,300	N/A	11,400
<b>Project Conditions</b>				
Conventional BART Project	3,100 (+0)	7,200 (-1,100)	4,700	15,000 (+3,600)
DMU Alternative	3,100 (+0)	7,900 (-400)	3,100	14,100 (+2,700)
Express Bus/BRT Alternative	3,100 (+0)	9,300 (+1,000)	N/A	12,400 (+1,000)
Enhanced Bus Alternative	3,100 (+0)	8,300 (+0)	N/A	11,400 (+0)
<b>Cumulative Conditions</b>				
Conventional BART Project	3,100 (+0)	8,000 (-300)	4,300	15,400 (+4,000)
DMU Alternative	3,100 (+0)	8,700 (+400)	2,700	14,500 (+3,100)
Express Bus/BRT Alternative	3,100 (+0)	9,900 (+1,600)	N/A	13,000 (+1,600)
Enhanced Bus Alternative	3,100 (+0)	9,200 (+900)	N/A	12,300 (+900)

**TABLE 3.B-22 TRI-VALLEY BART BOARDINGS (WEEKDAY), EXISTING AND 2025/2040**

	West Dublin/ Pleasanton	Dublin/ Pleasanton	Proposed Isabel Station	Total Tri-Valley
<b>2040</b>				
No Project Conditions	3,400	10,800	N/A	14,200
<b>Project Conditions</b>				
Conventional BART Project	3,600 (+200)	9,000 (-1,800)	8,100	20,700 (-6,500)
DMU Alternative	3,500 (+100)	9,800 (-1,000)	4,800	18,100 (-3,900)
Express Bus/BRT Alternative	3,400 (+0)	12,700 (+1,900)	N/A	16,100 (+1,900)
Enhanced Bus Alternative	3,500 (+100)	10,900 (+100)	N/A	14,400 (+200)
<b>Cumulative Conditions</b>				
Conventional BART Project	3,600 (+200)	10,000 (-800)	7,900	21,500 (+7,300)
DMU Alternative	3,500 (+100)	10,500 (-300)	4,700	18,700 (+4,500)
Express Bus/BRT Alternative	3,500 (+100)	13,300 (+2,500)	N/A	16,800 (+2,600)
Enhanced Bus Alternative	3,500 (+100)	11,600 (+800)	N/A	15,100 (+900)

Notes: N/A = not applicable.  
 Values in parentheses indicate change from No Project Conditions. Positive values indicate increase; negative values indicate decrease.  
 Existing (2013) data reflect the existing conditions from the BLVX Travel Demand Model and are not empirical data.  
 Source: Cambridge Systematics, 2017.

For total Tri-Valley boardings, trends are similar to those for the BART systemwide ridership. Boardings are expected to grow by 25 percent from 2025 to 2040 under No Project Conditions. Among the alternatives, the Proposed Project increases the number of boardings by the largest number over the No Project Conditions, followed by the DMU Alternative, Express Bus/BRT Alternative, and finally the Enhanced Bus Alternative.

Among the individual BART stations in the Tri-Valley Area, trends are not the same across alternatives. Boardings at the West Dublin/Pleasanton Station remain largely constant across all alternatives in the same analysis year; the station is parking-constrained and no other station access changes are proposed, so station access there remains relatively

unchanged. The Dublin/Pleasanton Station, however, loses boardings under alternatives in which the proposed Isabel Station is available (i.e., the Proposed Project and the DMU Alternative). The Isabel Station attracts park-and-ride BART passengers away from the Dublin/Pleasanton Station who find the Isabel Station to be more convenient. Also, major connecting bus services are routed to connect at the Isabel Station instead of the Dublin/Pleasanton Station under those alternatives. Under the Express Bus/BRT and Enhanced Bus Alternatives, the Dublin/Pleasanton Station gains boardings because the Isabel Station is not available to attract park-and-ride customers, and because more connecting buses serve the Dublin/Pleasanton Station.

Table 3.B-23 describes station access mode share at the Dublin/Pleasanton Station under Existing Conditions and in 2040. Mode of access reflects how BART riders arrive at the station—i.e., driving and parking, dropped off by private vehicle, via bus, or by walking or biking. The modes of access differ between the stations and reflect the travel and land use characteristics of the stations and station areas. For example, stations close to residential and employment population centers typically have a higher walk mode share. Also, end-of-line stations, such as the Dublin/Pleasanton Station in 2013, typically have higher vehicle and bus access than walk access, as they attract BART travelers from farther away. Boardings by mode are provided in the tables below for 2040 only. For 2025, overall ridership is lower than in 2040 for all alternatives, but the patterns are similar to those in 2040.

**TABLE 3.B-23 DUBLIN/PLEASANTON STATION ACCESS MODES AND DAILY BOARDINGS (WEEKDAY), 2040 CONDITIONS**

	Park-and-Ride	Other	Total
2013	4,600	2,700	7,300
2040 No Project	4,600	6,200	10,800
<b>2040 Project Conditions</b>			
Conventional BART Project	4,600	4,400	9,000
DMU Alternative	4,600	5,200	9,800
Express Bus/BRT Alternative	4,600	8,100	12,700
Enhanced Bus Alternative	4,600	6,300	10,900
<b>2040 Cumulative Conditions</b>			
Conventional BART Project	5,500	4,500	10,000
DMU Alternative	5,300	5,200	10,500
Express Bus/BRT Alternative	5,500	7,800	13,300
Enhanced Bus Alternative	5,400	6,200	11,600

Note: 2013 data shown in the table are output from the BLVX Travel Demand Model intended to reflect existing conditions.  
 Source: Cambridge Systematics, 2017.

In 2013, most of the BART patrons accessing the Dublin/Pleasanton Station do so by car. From 2013 to 2040 No Project Conditions, boardings at the Dublin/Pleasanton Station are expected to increase. Park-and-ride access is projected to remain the same due to limited parking facilities. To accommodate the increased usage of the station, access by other modes is projected to increase.

In 2040, under Project Conditions, boardings at the Dublin/Pleasanton Station—as discussed earlier—are expected to decrease compared to No Project Conditions with the Proposed Project and DMU Alternative and increase with the Express Bus/BRT and Enhanced Bus Alternatives. Park-and-ride access to the Dublin/Pleasanton Station under all alternatives is expected to be similar to 2013, dictated by the constrained parking supply. Access by other modes is forecast to increase or decrease depending on the overall boardings at the station under each alternative.

Under 2040 Cumulative Conditions, which includes a net expansion of the Dublin/Pleasanton Station parking by 540 spaces, that station attracts a large number of additional park-and-ride BART patrons—a higher number than the increase in supply, as some spaces are used more than once during the day or serve multiple patrons who are carpooling together. All other access modes remain similar in usage to Project Conditions (i.e., without expansion of Dublin/Pleasanton Station parking).

Table 3.B-24 shows similar access mode information for the proposed Isabel Station in 2040 (there are no existing or 2040 No Project Conditions data because the Isabel Station does not exist under those scenarios).

Similar to Dublin/Pleasanton in 2013, the dominant mode of access to the Isabel Station in 2040 is expected to be park-and-ride. This is because the Isabel Station in 2040 takes over the role that the Dublin/Pleasanton plays in 2013 as the end-of-line station.

Modes of access change for the Isabel Station under 2040 Cumulative Conditions compared to Project Conditions. Access by other modes (i.e., walking and biking) increases due to the increase in employment and housing in the INP area near the station. However, that increase is offset by a decrease in park-and-ride access, a result of the expanded parking supply at the Dublin/Pleasanton Station, which draws some BART patrons who otherwise would park at the Isabel Station.

**TABLE 3.B-24 PROPOSED ISABEL STATION ACCESS MODE AND DAILY BOARDINGS  
 (WEEKDAY), 2040 CONDITIONS**

	Park-and-Ride	Other	Total
2013	NA	NA	NA
2040 No Project	NA	NA	NA
<b>2040 Project Conditions</b>			
Conventional BART Project	4,300	3,800	8,100
DMU Alternative	2,300	2,500	4,800
Express Bus/Bus Rapid Transit Alternative	NA	NA	NA
Enhanced Bus Alternative	NA	NA	NA
<b>2040 Cumulative Conditions</b>			
Conventional BART Project	3,600	4,300	7,900
DMU Alternative	1,800	2,900	4,700
Express Bus/Bus Rapid Transit Alternative	NA	NA	NA
Enhanced Bus Alternative	NA	NA	NA

Note: 2013 data shown in the table are output from the BLVX Travel Demand Model intended to reflect existing conditions.  
 Source: Cambridge Systematics, 2017.

**(2) Passenger Loads and Fleet Requirements**

This section describes forecasted passenger loads on BART vehicles, as well as the number of BART vehicles required to meet the future passenger capacity needs.

Table 3.B-25 below shows the average systemwide peak hour passenger loads on BART cars under Existing Conditions, as well as under 2040 No Project, Proposed Project-only, and Cumulative Conditions, based on projections from the BLVX Travel Demand Model. Conventional BART Project is discussed here because it would generate the largest number of riders and would have the greatest effect on the BART system. Other alternatives would also generate ridership, but would have lesser effects on the system.

From 2013 to 2040 No Project Conditions, a modified BART service plan is expected to increase peak-period service on all lines, increasing passenger capacity throughout the system in the peak hour to address anticipated increases in demand.



**TABLE 3.B-25 BART SYSTEMWIDE AVERAGE PEAK-HOUR LOAD AT MAXIMUM LOAD POINTS (PASSENGERS PER CAR), 2040 CONDITIONS**

	AM	PM
2013	107	109
2040 No Project	106	108
<b>2040 Project Conditions</b>		
Conventional BART Project	106	107
DMU Alternative	105	106
Express Bus/Bus Rapid Transit Alternative	104	105
Enhanced Bus Alternative	106	108
<b>2040 Cumulative Conditions</b>		
Conventional BART Project	106	108
DMU Alternative	Not Available	Not Available
Express Bus/Bus Rapid Transit Alternative	Not Available	Not Available
Enhanced Bus Alternative	Not Available	Not Available

Sources:

Arup, 2013; Cambridge Systematics, 2017; Connetics Transportation Group, 2017.

Under 2040 Project Conditions, the analysis assumed further service increases on the Dublin/Pleasanton-Daly City line, specifically to accommodate the additional BART ridership attracted by the Proposed Project and to keep the passenger peak load on the Dublin/Pleasanton-Daly City line from deviating substantially from the systemwide average (for a description of the BART operating plan under the Proposed Project, please see Chapter 2, Project Description). Due to these service adjustments, average systemwide loads remain similar to those under 2040 No Project Conditions.

Under 2040 Cumulative Conditions, the analysis forecasts slightly higher ridership along the Dublin/Pleasanton-Daly City line (and as a result along the Fremont-Daly City and Fremont-Richmond lines), with the same level of BART service envisioned under the Proposed Project. Average systemwide loads under Cumulative Conditions remain similar to those under 2040 No Project Conditions and 2040 Project Conditions.

Table 3.B-26 below shows the morning peak hour loads at select stations along the Dublin/Pleasanton-Daly City line the westbound direction for future baseline conditions based on the BLVX Travel Demand Model.

Passenger loads for BART in 2040 were generated based on the BLVX Travel Demand Model’s station-to-station origin-destination trip forecasts and a BART Operations Model. For each alternative, the analysis adjusted the inputs regarding the BART operation plan and number of BART cars to reduce passenger crowding.

**TABLE 3.B-26 PEAK-HOUR TRAIN LOADS AT SELECTED STATIONS, DUBLIN/PLEASANTON-DALY CITY LINE (PASSENGERS PER CAR), EXISTING AND 2040**

	Existing 2013	2040 No Project Conditions	2040 Conventional BART Project	2040 Cumulative Conditions, Conventional BART Project
<b>AM, Peak (Westbound) Direction, Arriving Train</b>				
Bay Fair	82	93	96	99
Coliseum/OAK	98	90	89	92
West Oakland	104	107	101	104
Embarcadero	110	112	105	108

Sources:

Arup, 2013; Cambridge Systematics, 2017; Connetics Transportation Group, 2017.

Due to the service increases on the Dublin/Pleasanton-Daly City line under the Proposed Project, most stations presented in Table 3.B-26 experience modestly decreased passenger loads under Project Conditions. Under all scenarios, trains continue to experience maximum passenger loads at the Embarcadero BART Station in the AM and PM peak hour. The Bay Fair BART Station is the only location where peak hour passenger loads increase under the Proposed Project. A possible cause is Bay Fair’s function as a transfer point between the future Isabel-Daly City line and the future Santa Clara-Daly City and Santa Clara-Richmond lines.

The resulting BART fleet requirements from the anticipated service increases and passenger loads under the Proposed Project and each Alternative in 2025 and 2040 are noted in Table 3.B-27.

Fleet requirements increase substantially between Existing Conditions and 2025 and 2040 No Project Conditions. This increase in required fleet is due to more frequent BART service, and other BART extensions and projects. For both 2025 and 2040 Conditions, the Proposed Project (compared with the Build Alternatives) would lead to the highest increase in fleet requirements over No Project Conditions. The DMU Alternative and Express Bus/BRT Alternative lead to a smaller increase in fleet requirements over No Project

Conditions for 2025 and 2040, while the Enhanced Bus Alternative would require no additional fleet over No Project Conditions.

**TABLE 3.B-27 PROJECTED BART FLEET REQUIREMENTS**

	Number of Cars Needed
<b>2025</b>	
<b>No Project Conditions</b>	1,008
<b>Project Conditions</b>	
Conventional BART Project	1,038 (+30)
DMU Alternative	1,026 (+18)
Express Bus/BRT Alternative	1,014 (+6)
Enhanced Bus Alternative	1,008 (+0)
<b>2040</b>	
<b>No Project Conditions</b>	1,134
<b>Project Conditions</b>	
Conventional BART Project	1,170 (+36)
DMU Alternative	1,158 (+24)
Express Bus/BRT Alternative	1,146 (+12)
Enhanced Bus Alternative	1,134 (+0)

Notes: Cumulative Conditions fleet requirements are identical to those for Project Conditions.  
 2013 data shown in the table are output from the BLVX Travel Demand Model intended to reflect existing conditions.  
 The 2040 No Project fleet requirement shown here is similar to the BART Fleet of the Future plan for 1,116 vehicles.  
 Sources:  
 Cambridge Systematics, 2017; Connetics Transportation Group, 2017.

**(3) Station Parking**

BART operates parking facilities at the Dublin/Pleasanton Station and a park-and-ride lot at Airway Boulevard and Rutan Drive. These facilities, whose capacities are noted in Table 3.B-28, serve as parking for patrons of surrounding transit and the BART system.

Current parking demand at the Dublin/Pleasanton Station is high, with more patrons attempting to park at the station than are spaces.

**TABLE 3.B-28 BART PARKING FACILITIES, EXISTING**

<b>Location</b>	<b>Number of Spaces</b>
West Dublin Pleasanton Station	1,190
Dublin/Pleasanton Station	2,890
Park & Ride Lot on Airway Boulevard at Rutan Drive	150

The analysis used the BLVX Travel Demand Model to estimate parking demand based on projected park-and-ride passengers for each BART facility. The analysis indicated that future parking demand at the Dublin/Pleasanton Station would continue to be high under the Proposed Project and Build Alternatives, with Dublin/Pleasanton Station spaces continuing to be fully occupied by BART patrons. Elsewhere, the alternatives would provide new parking facilities to support demand for parking created by the proposed changes to transit infrastructure and service, as indicated in Chapter 2, Project Description.

Consistent with the BART Board adopted Station Access Policy (2016) for an Auto Dependent Station Access Type at Isabel, the Proposed Project and Build Alternatives sized these proposed parking facilities based on projected demand, as shown in Table 3.B-29 below. While the quantity of station parking has been designed to accommodate the anticipated demand, unanticipated demand for parking could exceed supply. This could result in BART patrons parking on local streets. If any of the cities were to request assistance in managing overflow parking by BART patrons, BART would work with that city to implement the BART Parking Management Toolkit, which provides recommended strategies for addressing parking overflow onto city streets (a copy of the Parking Management Toolkit is provided in Appendix D). In addition, the Isabel Station garage would be designed to accommodate the potential future construction of two additional levels of parking.

Both the Proposed Project and the DMU Alternative include a new parking structure at the proposed Isabel Station. The Express Bus/BRT Alternative relies on a combination of the existing small park-and-ride lot at Airway Boulevard near Isabel Avenue and a new park-and-ride lot to be built at the intersection of Laughlin Road and North Front Road. The Express Bus/BRT Alternative also features a new parking facility near the Dublin/Pleasanton Station, to replace existing surface parking at that location that would be eliminated because of the relocation of the I-580 freeway travel lanes necessary to accommodate the proposed Express Bus/BRT station platform. The Enhanced Bus Alternative provides no additional parking facilities.

**TABLE 3.B-29 PARKING DEMAND AT EXISTING AND PROPOSED BART PARKING FACILITIES, 2025 AND 2040**

	No Project Conditions	Conventional BART Project	DMU Alternative	Express Bus/BRT Alternative	Enhanced Bus Alternative
<b>2025</b>					
Existing Airway Boulevard Park-and-Ride Lot	40	N/A	N/A	110	150
Proposed Isabel Station Parking Structure	N/A	1,600	1,200	N/A	N/A
Proposed Laughlin Road Park-and-Ride Lot	N/A	N/A	N/A	180	N/A
<b>2040</b>					
Existing Airway Boulevard Park-and-Ride Lot	100	N/A	N/A	170	220
Proposed Isabel Station Parking Structure	N/A	3,200	2,100	N/A	N/A
Proposed Laughlin Road Park-and-Ride Lot	N/A	N/A	N/A	230	N/A

Note: N/A = not applicable.  
 Source: Cambridge Systematics, 2017.

**(4) Vehicle Miles Traveled**

This section describes projected changes in VMT as a result of the Proposed Project and Build Alternatives. VMT is defined as the number of all road VMT on a typical weekday, including all private vehicles and all public bus vehicles.

The Proposed Project and Build Alternatives result in VMT reductions compared with No Project Conditions, except for the Enhanced Bus Alternative in 2025, as presented in Table 3.B-30. The Proposed Project results in the highest VMT reductions; by attracting the most new BART riders, it reduces vehicle trips the most. The DMU Alternative has the second-highest amount of VMT reductions—a smaller reduction than under the Proposed Project—because this alternative requires passengers starting at the Isabel DMU station to transfer at the Dublin/Pleasanton Station, whereas under the Proposed Project, passengers have direct entry into the BART system at the Isabel Station. Express Bus/BRT provides the next highest VMT reduction, as bus service is less attractive to transit riders than rail service.

**TABLE 3.B-30 VMT REDUCTIONS SUMMARY (AVERAGE WEEKDAY)**

Scenario	Passenger VMT Reduction	Bus VMT Increase Relative to No Project Conditions	Total VMT Reduction
<b>2025 Project</b>			
Conventional BART	127,500	1,900	125,600
DMU Alternative	95,300	1,900	93,400
Express Bus/BRT Alternative	44,500	2,700	41,800
Enhanced Bus Alternative	300	2,600	(2,400)
<b>2025 Cumulative</b>			
Conventional BART	108,800	1,900	106,900
DMU Alternative	72,900	1,900	71,000
Express Bus/BRT Alternative	65,000	2,700	62,300
Enhanced Bus Alternative	29,000	2,600	26,400
<b>2040 Project</b>			
Conventional BART	245,900	1,900	244,000
DMU Alternative	142,500	1,900	140,600
Express Bus/BRT Alternative	95,300	2,700	92,600
Enhanced Bus Alternative	9,100	2,600	6,500
<b>2040 Cumulative</b>			
Conventional BART	274,600	1,900	272,700
DMU Alternative	166,400	1,900	164,500
Express Bus/BRT Alternative	115,600	2,700	112,900
Enhanced Bus Alternative	29,400	2,600	26,800

Note: VMT = vehicle miles traveled.  
 Source: Cambridge Systematics, 2017.

The Enhanced Bus Alternative results in negligible changes to VMT. The difference in VMT reduction under the Express Bus/BRT Alternative and the Enhanced Bus Alternative may be because while the Enhanced Bus Alternative includes improvements to bus service, it does not entail any major capital improvements to improve bus operations, and thus results in fewer additional transit riders. VMT reductions under the Enhanced Bus Alternative for 2025 Project Conditions are especially minor, eclipsed by the increase in the bus VMT (due to the bus service improvements proposed under the Alternative)—overall leading to a small increase in VMT for 2025 Project Conditions. It is the only scenario under which there is an increase in VMT.

The cumulative analysis for 2025 results in smaller VMT reductions for the Proposed Project and DMU Alternative than the VMT reductions for the Proposed Project and DMU Alternative in the 2025 project analysis. This is due to the level of parking supply assumed for the Proposed Project and the DMU Alternative under the cumulative analysis in comparison to the project analysis. The Proposed Project and DMU Alternative provide enough parking supply at the Isabel Station to meet the parking demand projected for the station, as well as to absorb a substantial portion of the latent parking demand originating from areas relatively close to the Dublin/Pleasanton Station. The presence of new parking at the Dublin/Pleasanton Station under the cumulative analysis—in addition to the significant proposed supply of parking at the Isabel Station—in total offers enough parking to attract park-and-ride trips to the station from greater distances, ultimately resulting in an increase in auto VMT under the cumulative analysis relative to the project analysis. The Express Bus/BRT Alternative and Enhanced Bus Alternative do not feature any parking at the Isabel Station, and thus do not lead to an increase in VMT under the cumulative analysis relative to the project analysis.

Unlike 2025, the cumulative analysis in 2040 results in higher VMT reductions for all alternatives—including the Proposed Project and the DMU Alternative—than VMT reductions under the project analysis for 2040. This is because 2040 features more jobs and housing in the INP area than 2025, resulting in more trips that shift from driving to using the Proposed Project and Build Alternatives. The VMT reductions from these shifts in 2040 overtake the increase in auto trips due to the addition of parking at the Dublin/Pleasanton Station. Therefore, VMT reductions are higher for the Proposed Project and Build Alternatives under the 2040 cumulative analysis compared to the 2040 project analysis.

VMT is reasonably expected to increase from 2025 to 2040 under No Project Conditions, consistent with projections based on continued regional land use development and planned and programmed transportation improvements. At the same time, if BART selects the No Project Alternative, the reductions in passenger VMT described above would not occur. As a result, as discussed in Sections 3.L, Greenhouse Gas Emissions and 3.M, Energy, the No Project Alternative is anticipated to result in significant impacts related to greenhouse gas emissions and energy consumption, without the benefit of VMT reductions attributable to Proposed Project or Build Alternatives offsetting a portion of the effects of VMT growth, as a consequence of BART's decision not to adopt a project.

**e. Summary of Impacts**

Table 3.B-31 summarizes the impacts of the Proposed Project and Alternatives described in the analysis below.

**TABLE 3.B-31 SUMMARY OF TRANSPORTATION IMPACTS**

Impacts	Significance Determinations <sup>a</sup>				
	No Project Alternative	Conventional BART Project	DMU Alternative (with EMU Option)	Express Bus/BRT Alternative	Enhanced Bus Alternative
<b>Construction</b>					
<b>Project Analysis</b>					
Impact TRAN-1: Result in a significant delay, safety hazard, or diminished access during construction	NI	LSM	LSM	LSM	LS
<b>Cumulative Analysis</b>					
Impact TRAN-2(CU): Result in a significant delay, safety hazard, or diminished access during construction under Cumulative Conditions	NI	NI	NI	NI	NI
<b>Operational</b>					
<b>Project Analysis (2025 and 2040)</b>					
Impact TRAN-3: General-purpose lane freeway segments operating at unacceptable LOS, under 2025 Project Conditions	NI	SU	SU	SU	LS
Impact TRAN-4: General-purpose lane freeway segments operating at unacceptable LOS, under 2040 Project Conditions	NI	SU	SU	NI	NI



**TABLE 3.B-31 SUMMARY OF TRANSPORTATION IMPACTS**

Impacts	Significance Determinations <sup>a</sup>				
	No Project Alternative	Conventional BART Project	DMU Alternative (with EMU Option)	Express Bus/BRT Alternative	Enhanced Bus Alternative
Impact TRAN-5: HOV/express lane freeway segments operating at unacceptable LOS, under 2025 Project Conditions	NI	LS	SU	LS	LS
Impact TRAN-6: HOV/express lane freeway segments operating at unacceptable LOS, under 2040 Project Conditions	NI	NI	NI	NI	NI
Impact TRAN-7: Intersections operating at unacceptable LOS, under 2025 Project Conditions	NI	SU	SU	LSM	NI
Impact TRAN-8: Intersections operating at unacceptable LOS, under 2040 Project Conditions	NI	SU	SU	SU	NI
Impact TRAN-9: Impede surrounding transit services from improving access to BART, reducing system inefficiencies, or increasing ridership, under 2025 or 2040 Project Conditions	NI	LS	LS	LS	NI
Impact TRAN-10: Worsen bicycle LTS, circulation and access, or safety hazards, under 2025 or 2040 Project Conditions	NI	B	B	NI	NI

**TABLE 3.B-31 SUMMARY OF TRANSPORTATION IMPACTS**

Impacts	Significance Determinations <sup>a</sup>				
	No Project Alternative	Conventional BART Project	DMU Alternative (with EMU Option)	Express Bus/BRT Alternative	Enhanced Bus Alternative
Impact TRAN-11: Worsen pedestrian crossing distance or delay, circulation and access, or safety hazards, under 2025 or 2040 Project Conditions	NI	B	B	LS	NI
Impact TRAN-12: Result in a change in air traffic patterns, under 2025 or 2040 Project Conditions	NI	NI	NI	NI	NI
Impact TRAN-13: Increase hazards due to a design feature or incompatible uses, under 2025 or 2040 Project Conditions	NI	NI	NI	NI	NI
Impact TRAN-14: Result in inadequate emergency access, under 2025 or 2040 Project Conditions	NI	NI	NI	NI	NI
<b>Cumulative Analysis (2025 and 2040)</b>					
Impact TRAN-15(CU): General-purpose lane freeway segments operating at unacceptable LOS, under 2025 Cumulative Conditions	NI	LS	LS	LS	LS
Impact TRAN-16(CU): General-purpose lane freeway segments operating at unacceptable LOS, under 2040 Cumulative Conditions	NI	SU	SU	NI	NI

**TABLE 3.B-31 SUMMARY OF TRANSPORTATION IMPACTS**

Impacts	Significance Determinations <sup>a</sup>				
	No Project Alternative	Conventional BART Project	DMU Alternative (with EMU Option)	Express Bus/BRT Alternative	Enhanced Bus Alternative
Impact TRAN-17(CU): HOV/express lane freeway segments operating at unacceptable LOS, under 2025 Cumulative Conditions	NI	NI	NI	NI	NI
Impact TRAN-18(CU): HOV/express lane freeway segments operating at unacceptable LOS, under 2040 Cumulative Conditions	NI	NI	NI	NI	NI
Impact TRAN-19(CU): Intersections operating at unacceptable LOS, under 2025 Cumulative Conditions	NI	SU	SU	LSM	LSM
Impact TRAN-20(CU): Intersections operating at unacceptable LOS, under 2040 Cumulative Conditions	NI	SU	SU	SU	SU
Impact TRAN-21(CU): Impede surrounding transit services from improving access to BART, reducing system inefficiencies, or increasing ridership, under 2025 or 2040 Cumulative Conditions	NI	LS	LS	LS	NI
Impact TRAN-22(CU): Worsen bicycle level of traffic stress, circulation and access, or safety hazards, under 2025 or 2040 Cumulative Conditions	NI	B	B	NI	NI

TABLE 3.B-31 SUMMARY OF TRANSPORTATION IMPACTS

Impacts	Significance Determinations <sup>a</sup>				
	No Project Alternative	Conventional BART Project	DMU Alternative (with EMU Option)	Express Bus/BRT Alternative	Enhanced Bus Alternative
Impact TRAN-23(CU): Worsen pedestrian crossing distance or delay, circulation and access, or safety hazards, under 2025 or 2040 Cumulative Conditions	NI	NI	NI	NI	NI

Notes: DMU = diesel multiple unit; EMU = electrical multiple unit; BRT = bus rapid transit; LTS = level of traffic stress.

NI=No impact; B=Beneficial impact; LS=Less-than-Significant impact, no mitigation required; LSM=Less-than-Significant impact with mitigation; SU=Significant and unavoidable, even with mitigation or no feasible mitigation available.

<sup>a</sup> All significance determinations listed in the table assume incorporation of applicable mitigation measures.

**f. Environmental Analysis**

Impacts related to project construction are described below, followed by operations-related impacts.

**(1) Construction Impacts**

Potential impacts related to project construction are described below, followed by cumulative construction impacts.

**(a) Construction – Project Analysis**

***Impact TRAN-1: Result in a significant delay, a safety hazard, or diminished access during construction.***

***(No Project Alternative: NI; Conventional BART Project: LSM; DMU Alternative: LSM; Express Bus/BRT Alternative: LSM; Enhanced Bus Alternative: LS)***

**No Project Alternative.** Under the No Project Alternative, the BART to Livermore Extension Project would not be implemented and there would be no physical changes in the environment associated with construction of the Proposed Project or any of the Build Alternatives. However, planned and programmed transportation improvements for

segments of I-580, local roadways and intersections, and core transit service improvements for BART, ACE, and LAVTA would be constructed. In addition, population and employment increases throughout Alameda County would result in continued land use development, including both residential and commercial. Construction of these improvements and development projects could generate traffic delays, safety hazards, or diminished access during construction. However, the effects of the other projects associated with the No Project Alternative have been or will be addressed in environmental documents prepared for those projects before they are implemented, and the No Project Alternative would not result in new impacts as a consequence of the BART Board of Directors' decision not to adopt a project. Therefore, the No Project Alternative is considered to have no impacts related delay, safety hazards, or diminished access during construction. **(NI)**

**Conventional BART Project.** Construction under the Proposed Project would require the relocation of I-580 lanes, as detailed in Chapter 2, Project Description. The relocation process would include building a replacement lane in each direction on the outside edge of the existing freeway, then closing the center lanes to construct the new tracks and the Isabel Station. The process would include relocation of frontage roads, relocation of interchange on- and off-ramps, shifting of freeway travel lanes, and reconstruction of one of the existing bridges constituting the Airway Boulevard freeway overpass. The discussion below describes potential impacts to vehicle traffic, transit, pedestrians, and bicycles, in turn.

### **Vehicle Traffic**

Construction vehicles and equipment would use I-580 and local roadways to access construction sites and staging areas along the project corridor. Trucks and equipment traffic could temporarily disrupt existing freeway traffic patterns during construction of the project. Construction traffic would include heavy equipment such as bulldozers, dump trucks, cranes, and excavators. The project corridor would allow much of the construction activity to occur within the I-580 median, with direct access to the construction site provided by the westbound and eastbound interior lanes through openings made in the concrete traffic barriers. However, temporary lane closures would be required for delivery and haul truck access. Depending on the locations and times of day of the lane closures, disruption to regular traffic circulation could be significant. Lane closures could also be necessary along I-580 for certain construction activities and material deliveries.

The Proposed Project has identified six potential construction staging areas, as noted in Chapter 2, Project Description. The Arnold Road Staging Area is between I-580 and Martinelli Way and between Campus Drive and Arnold Road; access from I-580 to this staging area would be from the Hacienda Drive interchange. The North Canyons Parkway Staging Area would be between I-580 and North Canyons Parkway, between Airway

Boulevard and Doolan Road; access from I-580 to this staging area would be from the Airway Boulevard interchange. The Isabel North Staging Area is north of I-580 at Isabel Avenue (potentially on either side of Isabel Avenue prior to development); access from I-580 to this staging area would be from the Isabel Avenue interchange. The Isabel South Staging Area under the Proposed Project would be north of I-580 and northeast of Campus Hill Drive, and serve the storage yard; access from I-580 would be from Isabel Avenue to Campus Hill Drive. The Kitty Hawk Road Staging Area, West of Isabel Avenue and north of Kitty Hawk Road, would serve construction of the wayside facility; access from I-580 would be from the Isabel Avenue interchange and the Airway interchange. The Storage and Maintenance Facility Staging Area, north of I-580 and northeast of Campus Hill Drive, would serve construction of the storage yard; access from I-580 would be from Isabel Avenue to Campus Hill Drive. The movement of hauling trucks to and from the staging areas would likely add a minor amount of delay to traffic along these streets.

Some temporary lane closures and lane shifts of I-580 would be required. Depending on the locations and times of day of lane closures, disruption to regular traffic circulation could be significant. Lane closures could also be necessary along I-580 for certain construction activities and material deliveries. Freeway travel would also be impeded by traffic from construction vehicles and equipment that would use I-580 to access and deliver materials to construction sites along the project corridor. Trucks and equipment traffic could temporarily disrupt existing freeway traffic patterns during the construction of the project. Construction traffic would include heavy equipment such as bulldozers, dump trucks, cranes, and excavators.

The Proposed Project's construction activities, as noted above, have the potential to create traffic safety hazards, which could be minimized if construction were accompanied by activities to manage its effects on vehicle traffic, as discussed further below. The Proposed Project would modify some local roads, including realigning frontage roads and interchange ramps that provide access in the local roadway network. These realignments would be completed while at least one travel lane remained open during construction, and access from the frontage roads to adjoining land uses would be retained at all times.

### **BART Transit**

Construction of new BART tracks in the freeway median would begin after the relocation of I-580. The existing BART tail tracks would be converted into mainline tracks to enable these tracks to accommodate higher train speeds as they tie into the mainline extension to Livermore. There would be two options for maintaining existing train storage capacity at the Dublin/Pleasanton Station tail tracks as they are modified into mainline tracks for the BART extension, as follows:

- One of the existing BART tail tracks could be extended to the I-580/Santa Rita Road interchange and be used for train storage, while the remaining tail track is upgraded to mainline track.
- Train storage could be temporarily moved to tail tracks between the Castro Valley BART Station and the West Dublin/Pleasanton Station.

Both of the above options would ensure that BART operations and existing storage capacity is not impacted during construction. Therefore, construction related to the Proposed Project would have a less-than-significant impact on the BART system.

### Surrounding Transit

Transit routes using the interchange ramps that would be relocated could experience delays from slower traffic. Transit routes traveling along this segment of Airway Boulevard, such as the current LAVTA Route 12, could experience delays caused by slower traffic resulting from closure of one of the Airway Boulevard bridges over I-580. The majority of the freeway ramp modifications would likely occur at off-peak times and result in minimal disruption to transit. Additional traffic from vehicles hauling materials between the construction sites and the staging areas could also pose a potential risk to the quality of transit service and operations. Construction along facilities in the study area and the movement of construction vehicles near staging areas would be planned and managed to minimize disruption to general traffic and transit operations. However, there would likely be some temporary added delay to local and express bus routes traveling on I-580 and the local streets near construction staging areas, due to construction under the Proposed Project.

### Bicycles and Pedestrians

Construction of the Proposed Project would not result in significant temporary impacts to bicycle access, circulation, or safety around the proposed station area, as construction would not involve blocking any bicycle facilities.

Construction of the Proposed Project would not result in significant temporary impacts to pedestrian access, circulation, or safety, as construction would not involve blocking any sidewalks or walking paths in the study area.

Overall, the Proposed Project's construction activities would have a less-than-significant impact on traffic delays, with implementation of **Mitigation Measure TRAN-1**, discussed further below, which includes creation of a Construction Phasing and Traffic Management Plan to minimize construction-related impacts on transportation. **(LSM)**

**DMU Alternative.** The DMU Alternative is similar to the Proposed Project in its construction method for I-580, but would affect a longer stretch of I-580 west of where the Proposed Project would end, to accommodate the DMU station and added BART car storage needs for the DMU Alternative. The I-580 lane relocations would begin approximately 2,000 feet west of the Dougherty Road interchange for the DMU Alternative. The DMU Alternative would have a similar impact to the Proposed Project for vehicle traffic during construction but would impact a longer segment of I-580.

For impacts to the BART system during construction, the DMU Alternative would also be similar to the Proposed Project, except for the portion near the Dublin/Pleasanton Station. The new DMU track, and the new DMU transfer platform, would be built north of the existing northern BART track and could be done without affecting existing BART operations. The existing BART tracks at the existing platform would remain in place. Construction would therefore cause minimal interruptions to existing BART service.

The DMU Alternative is identical to the Proposed Project in its construction impact to surrounding transit services.

The DMU Alternative is identical to the Proposed Project in its construction impact to bicycles and pedestrians.

Overall, the DMU Alternative's construction activities would have a less-than-significant impact on traffic delays with implementation of **Mitigation Measure TRAN-1**, discussed further below, which includes creation of a Construction Phasing and Traffic Management Plan to minimize construction-related impacts on transportation. **(LSM)**

**Express Bus/BRT Alternative.** The Express Bus/BRT Alternative would require the construction of a bus-to-rail transfer platform in the I-580 median, next to the existing BART platform at the Dublin/Pleasanton Station. This alternative would entail freeway relocation and lane construction sequences, similar to the Proposed Project, although for a short stretch of I-580 in the vicinity of the Dublin/Pleasanton Station to accommodate the bus transfer platforms, express bus lanes, and additional BART car storage track, approximately from the Dougherty Road to Tassajara Road interchanges.

The Arnold Road Staging Area would be used for construction staging under the Express Bus/BRT Alternative. This staging area is at the western end of the project corridor, northeast of the Dublin/Pleasanton Station. Access from I-580 to this staging area would be from the Hacienda Drive interchanges.

Construction along the BART ROW under this alternative includes new bus platforms in the I-580 median that connect to the existing Dublin/Pleasanton Station. The construction would prioritize keeping all lanes of the freeway open during construction. However, temporary lane closures would be required. Depending on the locations and times of day



of lane closures, disruption to regular traffic circulation could be significant. Lane closures may also be necessary along I-580 for certain construction activities and material deliveries.

Construction along streets used by transit routes in the study area and the movement of construction vehicles near staging areas would be planned and managed to minimize disruption to general traffic and transit operations. However, there would likely be some temporary added delay to local and express bus routes traveling on I-580 and Hacienda Drive, due to construction under the Express Bus/BRT Alternative.

Freeway travel would also be impeded by traffic from construction vehicles and equipment that would use I-580 to access construction sites along the project corridor. Trucks and equipment traffic could temporarily disrupt existing freeway traffic patterns during construction of the project. Construction traffic would include heavy equipment such as bulldozers, dump trucks, cranes, and excavators.

Construction along the BART ROW under this alternative for the new bus platform would require no modifications to BART tracks. Therefore, construction related to the Express Bus/BRT Alternative would have no significant impact on the BART system.

Construction of the Express Bus/BRT Alternative would have a similar impact to surrounding transit services as the Proposed Project, but that impact would be less pronounced because of the shorter segment of I-580 that would be affected by the necessary relocation.

Similar to the Proposed Project, the Express Bus/BRT Alternative would not have impacts to bicycle or pedestrian travel in the area.

Overall, construction activities under the Express Bus/BRT Alternative would have a less-than-significant impact on traffic delays, with implementation of **Mitigation Measure TRAN-1**, discussed further below, which includes creation of a Construction Phasing and Traffic Management Plan to minimize construction-related impacts on transportation. **(LSM)**

**Enhanced Bus Alternative.** There would be no major construction required under this alternative, besides the construction of bus bulbs and bus stop improvements in existing ROWs. Therefore, the Enhanced Bus Alternative would have less-than-significant impacts related to delays, safety hazards, or diminished access during construction, and no mitigation measures are required. **(LS)**

**Mitigation Measures.** As described above, the Proposed Project, DMU Alternative, and Express Bus/BRT Alternative would have potentially significant construction-related impacts to delays, safety, and access. However, with the implementation of **Mitigation**

**Measure TRAN-1**, which would require the development and implementation of a construction phasing and traffic management plan, potential impacts would be reduced to a less-than-significant level.

As described above, the Enhanced Bus Alternative would not have significant impacts; therefore, no mitigation measures are required for this alternative.

**Mitigation Measure TRAN-1: Develop and Implement a Construction Phasing and Traffic Management Plan (Conventional BART Project, DMU Alternative/EMU Option, and Express Bus/BRT Alternative).**

BART shall ensure that a Construction Phasing and Traffic Management Plan is developed and implemented by the construction contractor. The plan shall define how traffic operations, including construction equipment and worker traffic, will be managed and maintained during each phase of construction. The plan shall be developed in consultation with the Cities of Dublin, Pleasanton, and Livermore; local police, fire, and emergency service providers; Caltrans; Alameda CTC; Alameda County; and local transit providers, including LAVTA. The contractor shall also consult with Caltrans and the highway patrol in the development of the plan to address any issues and minimize disruption to the flow of traffic along I-580. This plan shall also be coordinated with plans to maintain access and parking for adjacent businesses and residences that may be affected.

To the maximum practical extent, the plan shall include the following measures:

1. Identify traffic control devices and actions that are needed to maintain traffic safety during the construction period, including traffic control personnel and clear road striping and signage, to facilitate movement of construction vehicles and communicate to vehicles where traffic patterns have shifted.
2. Specify predetermined haul routes from staging areas to construction sites and disposal areas by agreement with the Cities of Dublin, Pleasanton, and Livermore prior to construction. The routes shall follow streets and highways that provide the safest route and have the least possible impact on traffic.
3. Identify construction activities that, due to concerns regarding traffic safety or congestion, must take place during off-peak hours.
4. Provide a plan for any lane closures and require information be provided to the public and police, fire and emergency service providers on lane closures using signs, press releases, and other media tools.
5. Identify a telephone number that the public can call for information on construction scheduling, phasing, and duration, as well as for complaints. Such information shall also be posted on BART's website and at the construction sites.

6. Provide safe access and circulation routes for vehicles, bicycles, pedestrians, and emergency response vehicles during construction of the project components that would affect the local road network.
7. Provide parking replacement where construction results in temporary displacement of parking.

**(b) Construction – Cumulative Analysis**

***Impact TRAN-2(CU): Result in a significant delay, a safety hazard, or diminished access during construction under Cumulative Conditions.***

***(No Project Alternative: NI; Conventional BART Project: NI; DMU Alternative: NI; Express Bus/BRT Alternative: NI; Enhanced Bus Alternative: NI)***

**No Project Alternative.** As described in **Impact TRAN-1** above, the No Project Alternative would have no impacts associated with a significant delay, safety hazard, or diminished access during construction. Therefore, the No Project Alternative would not contribute to cumulative impacts. **(NI)**

**Conventional BART Project and Build Alternatives.** The cumulative projects described in Section 3.A, Introduction to Environmental Analysis and Appendix E, Cumulative Projects List would be constructed at locations not directly on the regional transportation system, and therefore would have no significant impact on safety hazards or diminished access for the system. The construction activities for these land developments, including delivery of materials and movement of construction equipment, would likely cause minor delays on adjacent local roadways. The Proposed Project's construction activities could contribute to those delays if they affected the same local roadways as the land development projects. The local roadways that would be affected by the Proposed Project are the I-580 frontage roads, interchange ramps, and overpasses between Hacienda Drive and Isabel Avenue, none of which are at the same locations as the cumulative land development projects that might be under construction at the same time. Therefore, the Proposed Project would not contribute further to cumulative impacts to traffic delays, safety hazards, or diminished access from the cumulative land developments.

The cumulative transportation projects that might be under construction at the same time as the Proposed Project and Build Alternatives include the ACEforward Program, the North Canyon Parkway/Dublin Boulevard Extension project, and the I-580 Vasco Road interchange improvements project. The locations of these projects are sufficiently far from the Proposed Project and Build Alternatives such that construction activities would not contribute to significant cumulative impacts to traffic delays, safety hazards, or diminished access from the cumulative transportation projects. Therefore, the Proposed Project and Build Alternatives would have no significant impacts related to delays, safety

hazards, or diminished access during construction, and no mitigation measures are required. (NI)

**Mitigation Measures.** As described above, the Proposed Project and Alternatives, in combination with past, present, or probable future projects, would not result in significant cumulative impacts related to delays, safety, or access, and no mitigation measures are required.

## (2) Operational Impacts

Potential impacts related to project operations are described below, followed by cumulative operations impacts. Impacts are presented in the following order: (1) freeway segments; (2) local roadway intersections; (3) transit; (4) bicycles; (5) pedestrians; (6) air traffic patterns; (7) hazards; and (8) emergency access.

### (a) Operations – Project Analysis

Potential impacts related to project operations are described below, followed by cumulative operations impacts.

#### Freeway Segments

***Impact TRAN-3: General-purpose lane freeway segments operating at unacceptable LOS, under 2025 Project Conditions.***

***(No Project Alternative: NI; Conventional BART Project: SU; DMU Alternative: SU; Express Bus/BRT Alternative: SU; Enhanced Bus Alternative: LS)***

Tables 3.B-32 through 3.B-35 below present the results of the general-purpose lane freeway segment LOS analysis for 2025, for the Proposed Project and Build Alternatives.

**No Project Alternative.** The 2025 No Project Alternative is the same as baseline conditions (i.e., 2025 No Project Conditions). Therefore, the 2025 No Project Alternative would have no impacts related to general-purpose freeway segments operating at unacceptable levels. (NI)

**Conventional BART Project.** With the implementation of the Proposed Project in 2025, regional traffic volumes will differ from traffic volumes that would exist 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. Figure 3.B-9 below shows the general change in traffic patterns for the Proposed Project compared with No Project conditions, as projected by the analysis.

**TABLE 3.B-32 AM WESTBOUND GENERAL-PURPOSE FREEWAY LEVEL OF SERVICE, 2025 PROJECT CONDITIONS**

#	To	From	No Project Alternative		Conventional BART Project		DMU Alternative (with EMU Option)		Express Bus/BRT Alternative		Enhanced Bus Alternative	
			LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C
1	Dougherty Road/Hopyard Road	Hacienda Drive	E	0.971	E	0.974	E	0.976	E	0.974	E	0.977
2	Hacienda Drive	Tassajara Road/Santa Rita Road	E	0.995	E	0.996	E	0.995	<b>F</b>	<b>1.001</b>	E	0.998
3	Tassajara Road/Santa Rita Road	Fallon Road/ El Charro Road	F	1.004	F	1.003	E	0.999	F	1.008	F	1.005
4	Fallon Road/ El Charro Road	Airway Boulevard	E	0.975	E	0.969	E	0.968	E	0.976	E	0.974
5	Airway Boulevard	Isabel Avenue	F	1.037	E	0.993	F	1.017	F	1.038	F	1.037
6	Isabel Avenue	Livermore Avenue	F	1.051	F	1.051	F	1.061	F	1.054	F	1.052
7	Livermore Avenue	Springtown Boulevard/ First Street	E	0.984	E	0.992	E	0.995	E	0.989	E	0.984
8	Springtown Boulevard/ First Street	Vasco Road	E	0.978	E	0.999	E	0.989	E	0.978	E	0.977
9	Vasco Road	Greenville Road	E	0.977	E	0.996	E	0.995	E	0.980	E	0.976
10	Greenville Road	Carroll Road/ Flynn Road	F	1.038	<b>F</b>	<b>1.061</b>	<b>F</b>	<b>1.065</b>	F	1.040	F	1.043

Notes: LOS = level of service; V/C = volume-to-capacity ratio.  
**Bold/gray shading** indicates segments that operate at unacceptable levels as the result of the Proposed Project or Alternatives.  
 Source: Cambridge Systematics, 2017.

**TABLE 3.B-33 PM WESTBOUND GENERAL-PURPOSE FREEWAY LEVEL OF SERVICE, 2025 PROJECT CONDITIONS**

#	To	From	DMU									
			No Project Alternative		Conventional BART Project		Alternative (with EMU Option)		Express Bus/BRT Alternative		Enhanced Bus Alternative	
			LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C
1	Dougherty Road/Hopyard Road	Hacienda Drive	C	0.634	C	0.639	C	0.636	C	0.636	C	0.637
2	Hacienda Drive	Tassajara Road/Santa Rita Road	C	0.630	C	0.614	C	0.623	C	0.631	C	0.632
3	Tassajara Road/Santa Rita Road	Fallon Road/ El Charro Road	C	0.659	C	0.643	C	0.652	C	0.660	C	0.661
4	Fallon Road/ El Charro Road	Airway Boulevard	C	0.623	C	0.606	C	0.614	C	0.623	C	0.625
5	Airway Boulevard	Isabel Avenue	B	0.545	B	0.520	B	0.533	B	0.550	B	0.550
6	Isabel Avenue	Livermore Avenue	C	0.636	C	0.611	C	0.629	C	0.638	C	0.637
7	Livermore Avenue	Springtown Boulevard/ First Street	B	0.513	B	0.515	B	0.517	B	0.513	B	0.512
8	Springtown Boulevard/ First Street	Vasco Road	C	0.586	C	0.598	C	0.595	C	0.589	C	0.589
9	Vasco Road	Greenville Road	B	0.578	B	0.579	B	0.578	B	0.577	B	0.578
10	Greenville Road	Carroll Road/ Flynn Road	C	0.603	C	0.621	C	0.618	C	0.608	C	0.603

Notes: LOS = level of service; V/C = volume-to-capacity ratio  
 Source: Cambridge Systematics, 2017.

**TABLE 3.B-34 AM EASTBOUND GENERAL-PURPOSE FREEWAY LEVEL OF SERVICE, 2025 PROJECT CONDITIONS**

#	To	From	No Project Alternative		Conventional BART Project		DMU Alternative (with EMU Option)		Express Bus/BRT Alternative		Enhanced Bus Alternative	
			LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C
1	Dougherty Road/Hopyard Road	Hacienda Drive	B	0.471	B	0.469	B	0.470	B	0.470	B	0.471
2	Hacienda Drive	Tassajara Road/Santa Rita Road	B	0.532	B	0.523	B	0.527	B	0.531	B	0.532
3	Tassajara Road/Santa Rita Road	Fallon Road/El Charro Road	B	0.567	B	0.558	B	0.562	B	0.565	B	0.567
4	Fallon Road/El Charro Road	Airway Boulevard	B	0.547	B	0.536	B	0.542	B	0.545	B	0.547
5	Airway Boulevard	Isabel Avenue	B	0.488	B	0.462	B	0.477	B	0.487	B	0.487
6	Isabel Avenue	Livermore Avenue	B	0.537	B	0.535	B	0.535	B	0.536	B	0.538
7	Livermore Avenue	Springtown Boulevard/First Street	B	0.519	B	0.533	B	0.526	B	0.519	B	0.520
8	Springtown Boulevard/First Street	Vasco Road	B	0.567	C	0.591	C	0.581	B	0.569	B	0.568
9	Vasco Road	Greenville Road	B	0.571	B	0.579	C	0.580	B	0.572	B	0.571
10	Greenville Road	Carroll Road/Flynn Road	B	0.444	B	0.452	B	0.452	B	0.446	B	0.445

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

**Bold/gray shading** indicates segments that operate at unacceptable levels as the result of the Proposed Project or Alternatives.

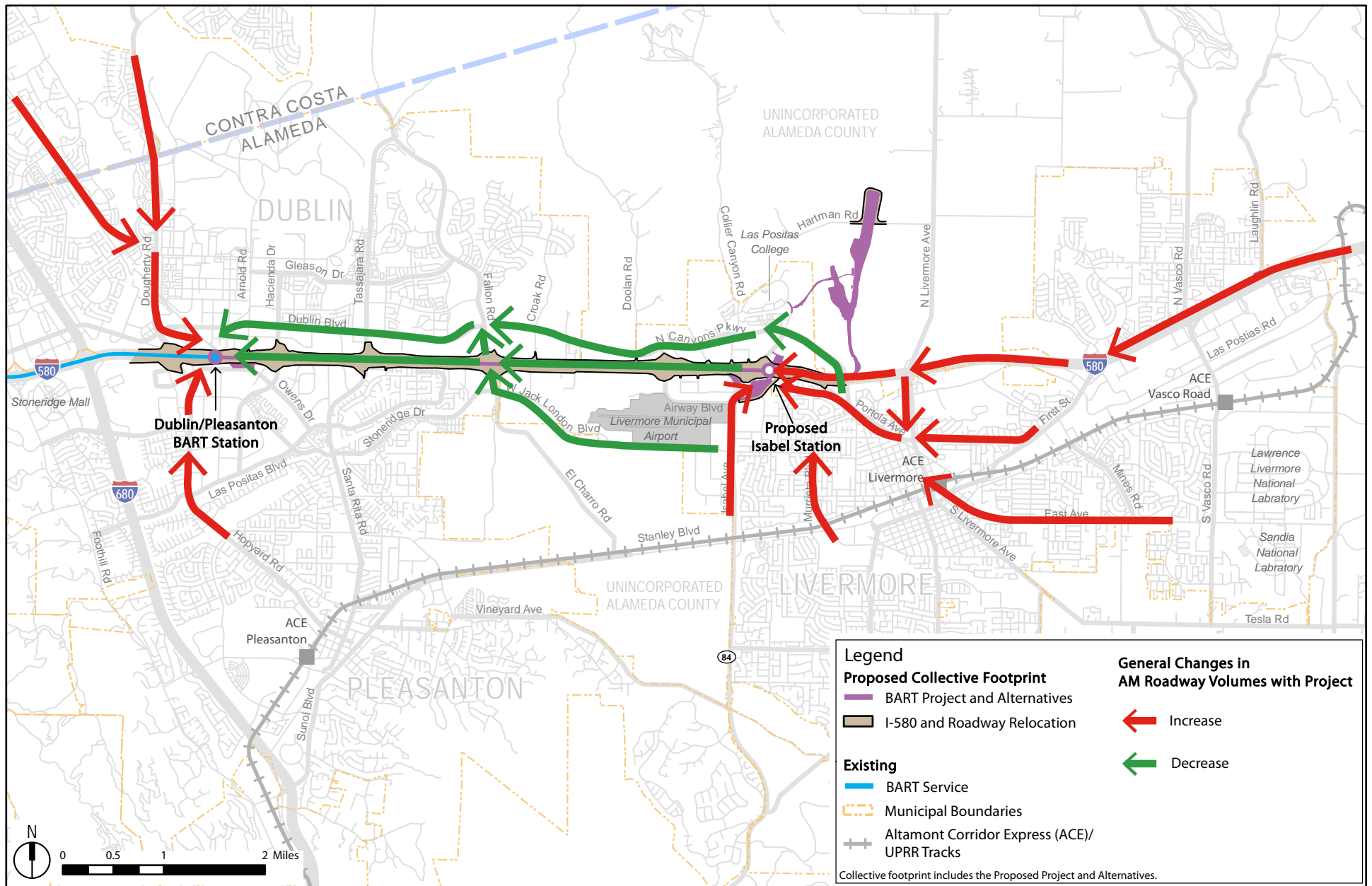
Source: Cambridge Systematics, 2017.

**TABLE 3.B-35 PM EASTBOUND GENERAL-PURPOSE FREEWAY LEVEL OF SERVICE, 2025 PROJECT CONDITIONS**

#	To	From	DMU									
			No Project Alternative		Conventional BART Project		Alternative (with EMU Option)		Express Bus/BRT Alternative		Enhanced Bus Alternative	
			LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C
1	Dougherty Road/ Hopyard Road	Hacienda Drive	C	0.714	C	0.714	C	0.712	C	0.712	C	0.712
2	Hacienda Drive	Tassajara Road/Santa Rita Road	D	0.899	D	0.892	D	0.896	D	0.896	D	0.895
3	Tassajara Road/Santa Rita Road	Fallon Road/ El Charro Road	E	0.954	E	0.934	E	0.946	E	0.949	E	0.948
4	Fallon Road/ El Charro Road	Airway Boulevard	E	0.970	E	0.943	E	0.951	E	0.963	E	0.963
5	Airway Boulevard	Isabel Avenue	E	0.953	E	0.927	E	0.943	E	0.949	E	0.949
6	Isabel Avenue	Livermore Avenue	F	1.037	F	1.039	F	1.050	F	1.031	F	1.034
7	Livermore Avenue	Springtown Boulevard/ First Street	E	0.922	E	0.939	E	0.938	E	0.915	E	0.920
8	Springtown Boulevard/ First Street	Vasco Road	E	0.903	E	0.916	E	0.919	D	0.893	E	0.902
9	Vasco Road	Greenville Road	D	0.892	E	0.911	E	0.908	D	0.888	D	0.886
10	Greenville Road	Carroll Road/ Flynn Road	D	0.817	D	0.838	D	0.834	D	0.817	D	0.813

Notes: LOS = level of service; V/C = volume-to-capacity ratio.  
 Source: Cambridge Systematics, 2017.





Source: Arup, 2017.

**Figure 3.B-9**  
**Transportation**  
**Traffic Pattern Changes, AM Peak Period**

As shown in the tables above and figure below, two corridors are expected to see increases in traffic volumes in the AM peak period, as follows:

- **Roadways north and south of the Dublin/Pleasanton Station (Dougherty Road and Hopyard Road).** A portion of existing BART passengers currently driving generally from the east to the Dublin/Pleasanton Station and parking would instead drive to and park at the proposed Isabel Station because it is more convenient for them. Parking facilities at the Dublin/Pleasanton Station are currently capacity-constrained, with unmet demand for parking. With fewer passengers originating from the east consuming parking capacity at the Dublin/Pleasanton Station, new park-and-ride auto trips from the north and south of the Dublin/Pleasanton Station are expected to consume the freed station parking capacity.
- **Roadways east of the Isabel Station (I-580, Altamont Pass roads, and Livermore local streets).** The new availability of BART service at the Isabel Station would attract new park-and-ride auto trips from the San Joaquin Valley and from within Livermore.

One corridor is expected to see decreases in traffic volumes in the AM peak period, as follows:

- **Roadways between the Dublin/Pleasanton Station and the Isabel Station (I-580, Dublin Boulevard, and Jack London Boulevard).** The new availability of BART service at the Isabel Station allows people to access BART service without driving west as far as the Dublin/Pleasanton Station.

In 2025, under the Proposed Project, one general-purpose freeway segment would have significant impacts compared to No Project Alternative. Impacts would occur at the following segments:

- **Greenville Road to Carroll Road General-Purpose (Segment 10).** Under 2025 with Proposed Project Conditions, this freeway segment would operate at a V/C ratio of 1.061 and LOS F during the AM peak hour in the westbound direction. The V/C ratio for this segment increases by more than 2 percent compared with No Project Conditions, resulting in a significant impact.

Typical mitigation measures that would address this type of significant impact 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. 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 No Project Conditions 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 Vasco Road 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, impacts under the Proposed Project related to general-purpose lane freeway segments in 2025 would be significant and unavoidable, and no mitigation measures are feasible. (SU)

**DMU Alternative.** The DMU Alternative would result in similar travel shifts as the Proposed Project in 2025, but with a smaller magnitude.

Under the DMU Alternative in 2025, one general-purpose freeway segments would have a significant impact compared to No Project Conditions. Impacts would occur at the following segments:

- **Greenville Road to Carroll Road General-Purpose (Segment 10).** Under 2025 with DMU Alternative Conditions, this freeway segment would operate at a V/C ratio of 1.065 and LOS F during the AM peak hour in the westbound direction. The V/C ratio for this segment increases by more than 2 percent than it would under No Project Conditions, resulting in a significant impact.

Potential mitigation measures for this significant impact would include capacity enhancements and operational improvements. As described in the No Project Conditions subsection above, this analysis already accounts for planned and programmed operational improvements along the study area segments of I-580. Additional improvements, such as capacity enhancement, are infeasible for the affected freeway segments. As described for the Proposed Project above, adding general-purpose lanes to I-580 is infeasible due to physical constraints and would have adverse impacts to existing uses along the affected freeway segments. In addition, social and environmental impacts from induced travel demand, including degradation of air quality, increased noise, and reductions in transit use would result from adding capacity to I-580. Therefore, in 2025, the DMU Alternative would have a significant and unavoidable impact on general-purpose lane freeway segments, similar to the Proposed Project, and no mitigation measures are feasible. (SU)

**Express Bus/BRT Alternative.** Traffic volumes estimated on roadway links would be similar under this alternative to those under No Project Conditions. However, in 2025, one general-purpose freeway segment would have a significant impact compared to No Project Conditions. An impact would occur at the following segment:

- **Hacienda Drive to Tassajara/Santa Rita Road General-Purpose (Segment 2).** Under 2025 with Express Bus Alternative Conditions, this freeway segment would operate at a V/C ratio of 1.001 and LOS F during the AM peak hour in the westbound direction. The V/C ratio for this segment increases by more than 2 percent than it would under No Project Conditions, resulting in a significant impact.

Potential mitigation measures for this significant impact would include capacity enhancements and operational improvements. As described in the No Project Conditions subsection above, this analysis already accounts for planned and programmed operational improvements along the study area segments of I-580. Additional improvements, such as capacity enhancement, are infeasible for the affected freeway segment. As described for the Proposed Project above, adding general-purpose lanes to I-580 is infeasible due to physical constraints and would have adverse impacts to existing uses along the affected freeway segments. In addition, social and environmental impacts from induced travel demand, including degradation of air quality, increased noise, and reductions in transit use would result from adding capacity to I-580. Therefore, in 2025, the Enhanced Bus/BRT Alternative would have a significant and unavoidable impact on general-purpose lane freeway segments, similar to the Proposed Project, and no mitigation measures are feasible. **(SU)**

**Enhanced Bus Alternative.** The Enhanced Bus Alternative would not meaningfully affect traffic patterns; in general, traffic volumes estimated on roadway links would be nearly the same as those under No Project Conditions. The Enhanced Bus Alternative in 2025 would have a smaller effect on freeway travel patterns than the other alternatives, as the Enhanced Bus Alternative would provide the least improvement over existing transit options, and thus attract the fewest additional travelers.

The Enhanced Bus Alternative would increase the V/C ratio of one general-purpose freeway segment already operating at unacceptable LOS. However, compared with No Project Conditions, the Enhanced Bus Alternative would not increase the V/C ratio of that segment by more than 2 percent. Therefore, impacts under the Express Bus/BRT Alternative related to general-purpose lane freeway segments in 2025 would be less than significant, and no mitigation measures are required. **(LS)**

**Mitigation Measures.** As described above, the Proposed Project, DMU Alternative, and Express Bus/BRT Alternative would have significant and unavoidable effects on general-purpose lane freeway segments in 2025; for the reasons described above, no freeway mitigation measures are feasible.

The Enhanced Bus Alternative would not result in any significant impacts related to general-purpose lane freeway segments in 2025, and no mitigation measures are required for this alternative.

***Impact TRAN-4: General-purpose lane freeway segments operating at unacceptable LOS, under 2040 Project Conditions.***

***(No Project Alternative: NI; Conventional BART Project: SU; DMU Alternative: SU; Express Bus/BRT Alternative: NI; Enhanced Bus Alternative: NI)***

Tables 3.B-36, 3.B-37, 3.B-38, and 3.B-39 below present the results of the general-purpose lane freeway segment LOS analysis for 2040.

**No Project Alternative.** Under the No Project Alternative, the BART to Livermore Extension Project would not be implemented and there would be no physical changes in the environment associated with the Proposed Project or any of the Build Alternatives. However, planned and programmed transportation improvements for segments of I-580, local roadways and intersections, and core transit service improvements for BART, ACE, and LAVTA would be constructed. In addition, population and employment increases throughout Alameda County would result in continued land use development, including both residential and commercial. These improvements and development projects could result in potential impacts to general purpose lane freeway segments. However, the effects of the other projects associated with the No Project Alternative scenario have been or will be addressed in environmental documents prepared for those projects before they are implemented, and the No Project Alternative would not result in new impacts as a consequence of the BART Board of Directors' decision not to adopt a project. Therefore, the No Project Alternative is considered to have no impact to general purpose lane freeway segments. **(NI)**

**Conventional BART Project.** Similar to 2025, the Proposed Project in 2040 would reduce the number of vehicle trips using I-580 as a travel route from points east to the Dublin/Pleasanton Station and to park, drop off, or pick up BART passengers, as such vehicles would instead be drawn to the proposed facilities 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 between Isabel Avenue and Hacienda Drive. The shifting of vehicles from the Dublin/Pleasanton Station to the Isabel Station would also cause small volume increases on roadways north and south of the Dublin/Pleasanton Station stemming from new park-and-ride trips from the north and south, which is expected to consume the freed station parking capacity. 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.

TABLE 3.B-36 AM WESTBOUND GENERAL-PURPOSE FREEWAY LEVEL OF SERVICE, 2040 PROJECT CONDITIONS

#	To	From	No Project Alternative		Conventional BART Project		DMU Alternative (with EMU Option)		Express Bus/BRT Alternative		Enhanced Bus Alternative	
			LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C
1	Dougherty Road/Hopyard Road	Hacienda Drive	E	0.981	E	0.979	E	0.979	E	0.981	E	0.983
2	Hacienda Drive	Tassajara Road/Santa Rita Road	<b>F</b>	<b>1.004</b>	E	0.995	E	0.998	F	1.008	F	1.007
3	Tassajara Road/Santa Rita Road	Fallon Road/ El Charro Road	F	1.020	F	1.014	F	1.012	F	1.019	F	1.022
4	Fallon Road/ El Charro Road	Airway Boulevard	E	0.995	E	0.967	E	0.973	E	0.995	E	0.997
5	Airway Boulevard	Isabel Avenue	<b>F</b>	<b>1.064</b>	F	1.033	F	1.060	F	1.066	F	1.068
6	Isabel Avenue	Livermore Avenue	<b>F</b>	<b>1.103</b>	<b>F</b>	<b>1.147</b>	<b>F</b>	<b>1.142</b>	F	1.104	F	1.104
7	Livermore Avenue	Springtown Boulevard/ First Street	<b>F</b>	<b>1.026</b>	<b>F</b>	<b>1.067</b>	<b>F</b>	<b>1.063</b>	F	1.027	F	1.024
8	Springtown Boulevard/ First Street	Vasco Road	<b>F</b>	<b>1.037</b>	<b>F</b>	<b>1.069</b>	<b>F</b>	<b>1.086</b>	F	1.035	F	1.037
9	Vasco Road	Greenville Road	<b>F</b>	<b>1.071</b>	<b>F</b>	<b>1.097</b>	F	1.090	F	1.070	F	1.069
10	Greenville Road	Carroll Road/ Flynn Road	F	1.056	<b>F</b>	<b>1.078</b>	F	1.072	F	1.061	F	1.060

Notes: LOS = level of service; V/C = volume-to-capacity ratio.  
**Bold**/gray shading indicates segments that operate at unacceptable levels.  
 Source: Cambridge Systematics, 2017.

**TABLE 3.B-37 PM WESTBOUND GENERAL-PURPOSE FREEWAY LEVEL OF SERVICE, 2040 PROJECT CONDITIONS**

#	To	From	DMU									
			No Project Alternative		Conventional BART Project		Alternative (with EMU Option)		Express Bus/BRT Alternative		Enhanced Bus Alternative	
			LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C
1	Dougherty Road/Hopyard Road	Hacienda Drive	C	0.748	D	0.750	D	0.751	C	0.747	C	0.749
2	Hacienda Drive	Tassajara Road/Santa Rita Road	D	0.758	C	0.746	C	0.745	D	0.755	D	0.757
3	Tassajara Road/Santa Rita Road	Fallon Road/ El Charro Road	D	0.780	D	0.774	D	0.775	D	0.777	D	0.780
4	Fallon Road/ El Charro Road	Airway Boulevard	D	0.754	C	0.730	C	0.737	D	0.752	D	0.756
5	Airway Boulevard	Isabel Avenue	C	0.664	C	0.656	C	0.651	C	0.664	C	0.667
6	Isabel Avenue	Livermore Avenue	D	0.771	D	0.753	D	0.754	D	0.769	D	0.772
7	Livermore Avenue	Springtown Boulevard/ First Street	C	0.738	C	0.729	C	0.735	C	0.737	C	0.737
8	Springtown Boulevard/ First Street	Vasco Road	D	0.826	D	0.835	D	0.834	D	0.826	D	0.827
9	Vasco Road	Greenville Road	D	0.776	D	0.788	D	0.785	D	0.775	D	0.776
10	Greenville Road	Carroll Road/ Flynn Road	D	0.750	D	0.762	D	0.759	D	0.751	D	0.750

Notes: LOS = level of service; V/C = volume-to-capacity ratio.  
 Source: Cambridge Systematics, 2017.

TABLE 3.B-38 AM EASTBOUND GENERAL-PURPOSE FREEWAY LEVEL OF SERVICE, 2040 PROJECT CONDITIONS

#	To	From	DMU									
			No Project Alternative		Conventional BART Project		Alternative (with EMU Option)		Express Bus/BRT Alternative		Enhanced Bus Alternative	
			LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C
1	Dougherty Road/ Hopyard Road	Hacienda Drive	B	0.548	B	0.546	B	0.547	B	0.545	B	0.548
2	Hacienda Drive	Tassajara Road/Santa Rita Road	C	0.651	C	0.633	C	0.633	C	0.648	C	0.652
3	Tassajara Road/Santa Rita Road	Fallon Road/ El Charro Road	C	0.668	C	0.650	C	0.651	C	0.665	C	0.669
4	Fallon Road/ El Charro Road	Airway Boulevard	C	0.653	C	0.636	C	0.637	C	0.651	C	0.655
5	Airway Boulevard	Isabel Avenue	C	0.588	B	0.541	B	0.558	C	0.584	C	0.591
6	Isabel Avenue	Livermore Avenue	C	0.633	C	0.615	C	0.618	C	0.634	C	0.637
7	Livermore Avenue	Springtown Boulevard/ First Street	C	0.628	C	0.635	C	0.635	C	0.629	C	0.631
8	Springtown Boulevard/ First Street	Vasco Road	D	0.766	D	0.772	D	0.770	D	0.763	D	0.765
9	Vasco Road	Greenville Road	C	0.674	C	0.685	C	0.681	C	0.673	C	0.674
10	Greenville Road	Carroll Road/ Flynn Road	B	0.567	B	0.576	B	0.573	B	0.567	B	0.567

Notes: LOS = level of service; V/C = volume-to-capacity ratio.  
 Source: Cambridge Systematics, 2017.



**TABLE 3.B-39 PM EASTBOUND GENERAL-PURPOSE FREEWAY LEVEL OF SERVICE, 2040 PROJECT CONDITIONS**

#	To	From	DMU									
			No Project Alternative		Conventional BART Project		Alternative (with EMU Option)		Express Bus/BRT Alternative		Enhanced Bus Alternative	
			LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C
1	Dougherty Road/Hopyard Road	Hacienda Drive	C	0.684	C	0.684	C	0.680	C	0.685	C	0.686
2	Hacienda Drive	Tassajara Road/Santa Rita Road	E	0.940	E	0.931	E	0.935	E	0.942	E	0.941
3	Tassajara Road/Santa Rita Road	Fallon Road/ El Charro Road	E	0.976	E	0.961	E	0.971	E	0.977	E	0.979
4	Fallon Road/ El Charro Road	Airway Boulevard	E	0.970	E	0.957	E	0.967	E	0.971	E	0.970
5	Airway Boulevard	Isabel Avenue	E	0.992	E	0.969	E	0.983	E	0.994	E	0.995
6	Isabel Avenue	Livermore Avenue	<b>F</b>	<b>1.083</b>	<b>F</b>	<b>1.121</b>	<b>F</b>	<b>1.130</b>	F	1.084	F	1.085
7	Livermore Avenue	Springtown Boulevard/ First Street	<b>F</b>	<b>1.013</b>	<b>F</b>	<b>1.043</b>	<b>F</b>	<b>1.064</b>	F	1.011	F	1.011
8	Springtown Boulevard/ First Street	Vasco Road	<b>F</b>	<b>1.016</b>	<b>F</b>	<b>1.049</b>	<b>F</b>	<b>1.067</b>	F	1.017	F	1.020
9	Vasco Road	Greenville Road	E	0.957	E	0.993	<b>F</b>	<b>1.011</b>	E	0.957	E	0.958
10	Greenville Road	Carroll Road/ Flynn Road	D	0.816	D	0.846	D	0.859	D	0.817	D	0.817

Notes: LOS = level of service; V/C = volume-to-capacity ratio.  
**Bold/gray shading** indicates segments that operate at unacceptable levels.  
 Source: Cambridge Systematics, 2017.

Under the Proposed Project in 2040, significant impacts would occur on five general-purpose freeway segments, compared to No Project Conditions. Impacts would occur at the following segments:

- **Isabel Avenue to Livermore Avenue General-Purpose (Segment #6).** This segment would operate at a V/C ratio of 1.147 and LOS F during the AM peak hour in the westbound direction and a V/C ratio of 1.121 and LOS F during the PM peak hour in the eastbound direction.
- **Livermore Avenue to Springtown Boulevard General-Purpose (Segment #7).** This segment would operate at a V/C ratio of 1.06 and LOS F during the AM peak hour in the westbound direction and a V/C ratio of 1.043 and LOS F during the PM peak hour in the eastbound direction.
- **Springtown Boulevard to Vasco Road General-Purpose (Segment #8).** This segment would operate at a V/C ratio of 1.069 and LOS F during the AM peak hour in the westbound direction and a V/C ratio of 1.049 and LOS F during the PM peak hour in the eastbound direction.
- **Vasco Road to Greenville Road General-Purpose (Segment #9).** This segment would operate at a V/C ratio of 1.097 and LOS F during the AM peak hour in the westbound direction.
- **Greenville Road to Carroll Road General-Purpose (Segment #10).** This segment would operate at a V/C ratio of 1.078 and LOS F during the AM peak hour in the westbound direction.

Typical mitigation measures that would address this type of significant impact 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. The transportation analysis already accounts for these types of planned and programmed operational improvements along the study area segments of I-580, as described in the No Project Conditions 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 Vasco Road 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, impacts under the Proposed Project related to general-purpose lane freeway segments in 2040 would be significant and unavoidable, and no mitigation measures are feasible. (SU)

**DMU Alternative.** The DMU Alternative in 2040 would result in similar travel shifts as the Proposed Project, but with a smaller magnitude.

Under the DMU Alternative in 2040, four general-purpose freeway segments would have a significant impact compared to No Project Conditions. Impacts would occur at the following segments:

- **Isabel Avenue to Livermore Avenue General-Purpose (Segment #6).** This segment would operate at a V/C ratio of 1.142 and LOS F during the AM peak hour in the westbound direction and a V/C ratio of 1.130 and LOS F during the PM peak hour in the eastbound direction.
- **Livermore Avenue to Springtown Boulevard General-Purpose (Segment #7).** This segment would operate at a V/C ratio of 1.063 and LOS F during the AM peak hour in the westbound direction and a V/C ratio of 1.064 and LOS F during the PM peak hour in the eastbound direction.
- **Springtown Boulevard to Vasco Road General-Purpose (Segment #8).** 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 1.067 and LOS F during the PM peak hour in the eastbound direction.
- **Vasco Road to Greenville Road General-Purpose (Segment #9).** This segment would operate at a V/C ratio of 1.011 and LOS F during the PM peak hour in the eastbound direction.

Potential mitigation measures for this significant impact would include capacity enhancements and operational improvements. As described in the No Project Conditions subsection above, this analysis already accounts for planned and programmed operational improvements along the study area segments of I-580.

Additional improvements, such as capacity enhancement, are infeasible for the affected freeway segments. As described for the Proposed Project above, adding general-purpose lanes to I-580 is infeasible due to physical constraints and would have adverse impacts to existing uses along the affected freeway segments. In addition, social and environmental impacts from induced travel demand, including degradation of air quality, increased noise, and reductions in transit use would result from adding capacity to I-580. Therefore, in 2040, the DMU Alternative would have a significant and unavoidable impact on general-purpose lane freeway segments, similar to the Proposed Project, and no mitigation measures are feasible. (SU)

**Express Bus/BRT Alternative.** Under the Express Bus/BRT Alternative in 2040, eight general-purpose freeway segments would operate at unacceptable levels during the AM or PM peak period. However, all segments would operate at an LOS equal to or better than the No Project Conditions. Therefore, the Express Bus/BRT Alternative would have no impacts related to general-purpose lane freeway segments in 2040, and no mitigation measures are required. **(NI)**

**Enhanced Bus Alternative.** Under the Enhanced Bus Alternative in 2040, eight general-purpose freeway segments would operate at unacceptable levels during the AM or PM peak period. However, all segments would operate at an LOS equal to or better than the No Project Conditions. Therefore, the Enhanced Bus Alternative would have no impacts related to general-purpose lane freeway segments in 2040, and no mitigation measures are required. **(NI)**

**Mitigation Measures.** As described above, the Proposed Project and DMU Alternative would have significant and unavoidable effects on general-purpose lane freeway segments in 2040; for the reasons described above no freeway mitigations are feasible.

The Express Bus/BRT Alternative and Enhanced Bus Alternative would not result in any significant impacts related to general-purpose lane freeway segments, and no mitigation measures are required for these alternatives.

***Impact TRAN-5: HOV/Express lane freeway segments operating at unacceptable LOS, under 2025 Project Conditions.***

***(No Project Alternative: NI; Conventional BART Project: LS; DMU Alternative: SU; Express Bus/BRT Alternative: LS; Enhanced Bus Alternative: LS)***

Tables 3.B-40, 3.B-41, 3.B-42, and 3.B-43 below presents the results of the HOV/express lane freeway segment LOS analysis for 2025, for the Proposed Project and Alternatives.

**No Project Alternative.** The 2025 No Project Alternative is the same as baseline conditions (i.e., 2025 No Project Conditions). Therefore, the 2025 No Project Alternative would have no impacts related to HOV/express lane freeway segments operating at unacceptable levels. **(NI)**

**Conventional BART Project.** Under the Proposed Project in 2025, four HOV/express lane freeway segments would operate at unacceptable levels during both peak periods. However, these segments are expected to operate similarly to No Project Conditions. HOV/express lane operations would not degrade past the threshold of significance. Therefore, impacts under the Proposed Project related to HOV/express lane freeway segments would be less than significant, and no mitigation measures are required. **(LS)**

**TABLE 3.B-40 AM WESTBOUND HOV/EXPRESS LANE FREEWAY LEVEL OF SERVICE, 2025 PROJECT CONDITIONS**

#	To	From	No Project Alternative		Conventional BART Project		DMU Alternative (with EMU Option)		Express Bus/BRT Alternative		Enhanced Bus Alternative	
			LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C
1	Dougherty Road/Hopyard Road	Hacienda Drive	E	0.978	E	0.978	E	0.977	E	0.968	E	0.984
2	Hacienda Drive	Tassajara Road/Santa Rita Road	F	1.014	F	1.012	F	1.013	F	1.013	F	1.014
3	Tassajara Road/Santa Rita Road	Fallon Road/ El Charro Road	F	1.024	F	1.020	F	1.019	F	1.020	F	1.026
4	Fallon Road/ El Charro Road	Airway Boulevard	E	0.990	E	0.979	E	0.988	E	0.983	E	0.995
5	Airway Boulevard	Isabel Avenue	F	1.044	E	0.999	F	1.034	F	1.036	F	1.041
6	Isabel Avenue	Livermore Avenue	F	1.055	F	1.049	F	1.065	F	1.051	F	1.058
7	Livermore Avenue	Springtown Boulevard/ First Street	E	0.994	E	0.990	<b>F</b>	<b>1.003</b>	E	0.984	E	0.993
8	Springtown Boulevard/ First Street	Vasco Road	E	0.981	E	0.990	E	0.996	E	0.971	E	0.985
9	Vasco Road	Greenville Road	D	0.866	D	0.872	D	0.839	D	0.844	D	0.859
10	Greenville Road	Carroll Road/ Flynn Road	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

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: Cambridge Systematics, 2017.

**TABLE 3.B-41 PM WESTBOUND HOV/EXPRESS LANE FREEWAY LEVEL OF SERVICE, 2025 PROJECT CONDITIONS**

#	To	From	DMU									
			No Project Alternative		Conventional BART Project		Alternative (with EMU Option)		Express Bus/BRT Alternative		Enhanced Bus Alternative	
			LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C
1	Dougherty Road/Hopyard Road	Hacienda Drive	B	0.449	B	0.428	B	0.446	B	0.451	B	0.445
2	Hacienda Drive	Tassajara Road/Santa Rita Road	B	0.448	B	0.427	B	0.444	B	0.449	B	0.443
3	Tassajara Road/Santa Rita Road	Fallon Road/El Charro Road	B	0.474	B	0.446	B	0.467	B	0.474	B	0.470
4	Fallon Road/El Charro Road	Airway Boulevard	B	0.473	B	0.446	B	0.467	B	0.473	B	0.469
5	Airway Boulevard	Isabel Avenue	B	0.426	B	0.418	B	0.423	B	0.428	B	0.423
6	Isabel Avenue	Livermore Avenue	B	0.421	B	0.412	B	0.418	B	0.423	B	0.416
7	Livermore Avenue	Springtown Boulevard/First Street	B	0.366	B	0.364	B	0.366	B	0.368	B	0.361
8	Springtown Boulevard/First Street	Vasco Road	B	0.356	B	0.356	B	0.357	B	0.358	B	0.351
9	Vasco Road	Greenville Road	A	0.180	A	0.227	A	0.220	A	0.201	A	0.187
10	Greenville Road	Carroll Road/Flynn Road	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Notes: N/A = not applicable; LOS = level of service; V/C = volume-to-capacity ratio.  
 Source: Cambridge Systematics, 2017.

**TABLE 3.B-42 AM EASTBOUND HOV/EXPRESS LANE FREEWAY LEVEL OF SERVICE, 2025 PROJECT CONDITIONS**

#	To	From	No Project Alternative		Conventional BART Project		DMU Alternative (with EMU Option)		Express Bus/BRT Alternative		Enhanced Bus Alternative	
			LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C
1	Dougherty Road/Hopyard Road	Hacienda Drive	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
2	Hacienda Drive	Tassajara Road/Santa Rita Road	A	0.291	A	0.215	A	0.266	A	0.283	A	0.287
3	Tassajara Road/Santa Rita Road	Fallon Road/ El Charro Road	A	0.293	A	0.217	A	0.267	A	0.284	A	0.289
4	Fallon Road/ El Charro Road	Airway Boulevard	A	0.147	A	0.109	A	0.134	A	0.143	A	0.145
5	Airway Boulevard	Isabel Avenue	A	0.147	A	0.109	A	0.134	A	0.143	A	0.145
6	Isabel Avenue	Livermore Avenue	A	0.147	A	0.109	A	0.135	A	0.143	A	0.145
7	Livermore Avenue	Springtown Boulevard/ First Street	A	0.147	A	0.109	A	0.134	A	0.142	A	0.145
8	Springtown Boulevard/ First Street	Vasco Road	A	0.146	A	0.108	A	0.133	A	0.142	A	0.143
9	Vasco Road	Greenville Road	A	0.000	A	0.000	A	0.000	A	0.000	A	0.000
10	Greenville Road	Carroll Road/ Flynn Road	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Notes: N/A = not applicable; LOS = level of service; V/C = volume-to-capacity ratio.  
 Source: Cambridge Systematics, 2017.

**TABLE 3.B-43 PM EASTBOUND HOV/EXPRESS LANE FREEWAY LEVEL OF SERVICE, 2025 PROJECT CONDITIONS**

#	To	From	No Project Alternative		Conventional BART Project		DMU Alternative (with EMU Option)		Express Bus/BRT Alternative		Enhanced Bus Alternative	
			LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C
1	Dougherty Road/Hopyard Road	Hacienda Drive	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
2	Hacienda Drive	Tassajara Road/Santa Rita Road	D	0.827	D	0.812	D	0.813	D	0.834	D	0.819
3	Tassajara Road/Santa Rita Road	Fallon Road/ El Charro Road	D	0.846	D	0.831	D	0.835	D	0.854	D	0.837
4	Fallon Road/ El Charro Road	Airway Boulevard	B	0.442	B	0.430	B	0.434	B	0.445	B	0.436
5	Airway Boulevard	Isabel Avenue	B	0.398	B	0.390	B	0.391	B	0.402	B	0.394
6	Isabel Avenue	Livermore Avenue	B	0.433	B	0.426	B	0.428	B	0.437	B	0.429
7	Livermore Avenue	Springtown Boulevard/ First Street	B	0.402	B	0.389	B	0.394	B	0.408	B	0.397
8	Springtown Boulevard/ First Street	Vasco Road	B	0.364	B	0.357	B	0.357	B	0.370	B	0.360
9	Vasco Road	Greenville Road	C	0.624	C	0.614	C	0.610	C	0.637	C	0.618
10	Greenville Road	Carroll Road/ Flynn Road	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Notes: N/A = not applicable; LOS = level of service; V/C = volume-to-capacity ratio.  
 Source: Cambridge Systematics, 2017.



**DMU Alternative.** Under the DMU Alternative in 2025, one express lane freeway segment would have a significant impact compared to No Project Conditions. Impacts would occur at the following segment:

- **Tassajara/Santa Rita Road to Fallon/El Charro Road Express Lane (Segment #7).** Under 2025 with DMU Alternative Conditions, this express lane freeway segment would operate at a V/C ratio of 1.003 and LOS F during the AM peak hour in the westbound direction. The V/C ratio for this segment increases by more than 2 percent than it would under No Project Conditions, resulting in a significant impact.

Typical mitigation measures that would address this type of significant impact 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. The transportation analysis already accounts for these types of planned and programmed operational improvements along the study area segments of I-580, as described in the No Project Conditions 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 Vasco Road 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, impacts under the DMU Alternative related to express lane freeway segments in 2025 would be significant and unavoidable, and no mitigation measures are feasible. **(SU)**

**Express Bus/BRT Alternative.** Under the Express Bus/BRT Alternative in 2025, four HOV/express lane freeway segments would operate at unacceptable levels during both peak periods. However, these segments are expected to operate similarly to No Project Conditions. HOV/express lane operations would not degrade past the threshold of significance. Therefore, impacts under the Express Bus/BRT Alternative related to HOV/express lane freeway segments in 2025 would be less than significant, and no mitigation measures are required. **(LS)**

**Enhanced Bus Alternative.** Under the Enhanced Bus Alternative in 2025, four HOV/express lane freeway segments would operate at unacceptable levels during both peak periods. However, these segments are expected to operate similarly to No Project

conditions. HOV/express lane operations would not degrade past the threshold of significance. Therefore, impacts under the Enhanced Bus Alternative related to HOV/express lane freeway segments in 2025 would be less than significant, and no mitigation measures are required. **(LS)**

**Mitigation Measures.** As described above, the DMU Alternative would have significant and unavoidable effects to express lane freeway segments in 2025, as no freeway mitigations are feasible.

The Proposed Project, Express Bus/BRT Alternative, and Enhanced Bus Alternative would not result in significant impacts related to express lane freeway segments in 2025, and no mitigation measures are required for these alternatives.

***Impact TRAN-6: HOV/express lane freeway segments operating at unacceptable LOS, under 2040 Project Conditions.***

***(No Project Alternative: NI; Conventional BART Project: NI; DMU Alternative: NI; Express Bus/BRT Alternative: NI; Enhanced Bus Alternative: NI)***

Under 2040 Project Conditions, the HOV policy is expected to be three persons per vehicle as opposed to 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.

Tables 3.B-44, 3.B-45, 3.B-46, and 3.B-47 below present the results of the HOV/express lane freeway segment LOS analysis for 2040, for the Proposed Project and Alternatives.

**No Project Alternative.** Under the No Project Alternative, the BART to Livermore Extension Project would not be implemented and there would be no physical changes in the environment associated with the Proposed Project or any of the Build Alternatives. However, planned and programmed transportation improvements for segments of I-580, local roadways and intersections, and core transit service improvements for BART, ACE, and LAVTA would be constructed. In addition, population and employment increases throughout Alameda County would result in continued land use development, including both residential and commercial. These improvements and development projects could result in potential impacts to HOV/express lane freeway segments. However, the effects of the other projects associated with the No Project Alternative scenario have been or will be addressed in environmental documents prepared for those projects before they are implemented, and the No Project Alternative would not result in new impacts as a consequence of the BART Board of Directors' decision not to adopt a project. Therefore, the No Project Alternative is considered to have no impact to HOV/express lane freeway segments. **(NI)**

**TABLE 3.B-44 AM WESTBOUND I-580 HOV/EXPRESS LANE LEVEL OF SERVICE, 2040 PROJECT CONDITIONS**

#	To	From	DMU									
			No Project Alternative		Conventional BART Project		Alternative (with EMU Option)		Express Bus/BRT Alternative		Enhanced Bus Alternative	
			LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C
1	Dougherty Road/Hopyard Road	Hacienda Drive	B	0.466	B	0.454	B	0.460	B	0.460	B	0.465
2	Hacienda Drive	Tassajara Road/Santa Rita Road	B	0.450	B	0.438	B	0.445	B	0.444	B	0.450
3	Tassajara Road/Santa Rita Road	Fallon Road/ El Charro Road	B	0.446	B	0.434	B	0.441	B	0.440	B	0.446
4	Fallon Road/ El Charro Road	Airway Boulevard	B	0.435	B	0.421	B	0.432	B	0.431	B	0.436
5	Airway Boulevard	Isabel Avenue	B	0.399	B	0.389	B	0.396	B	0.393	B	0.398
6	Isabel Avenue	Livermore Avenue	B	0.396	B	0.386	B	0.394	B	0.388	B	0.394
7	Livermore Avenue	Springtown Boulevard/ First Street	B	0.378	B	0.372	B	0.377	B	0.371	B	0.378
8	Springtown Boulevard/ First Street	Vasco Road	A	0.349	A	0.342	A	0.345	A	0.343	B	0.356
9	Vasco Road	Greenville Road	A	0.280	A	0.279	A	0.279	A	0.280	A	0.275
10	Greenville Road	Carroll Road/ Flynn Road	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Notes: N/A = not applicable; LOS = level of service; V/C = volume-to-capacity ratio.  
 Source: Cambridge Systematics, 2017.

**TABLE 3.B-45 PM WESTBOUND I-580 HOV/EXPRESS LANE LEVEL OF SERVICE, 2040 PROJECT CONDITIONS**

#	To	From	No Project Alternative		Conventional BART Project		DMU Alternative (with EMU Option)		Express Bus/BRT Alternative		Enhanced Bus Alternative	
			LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C
1	Dougherty Road/ Hopyard Road	Hacienda Drive	A	0.214	A	0.210	A	0.215	A	0.210	A	0.215
2	Hacienda Drive	Tassajara Road/Santa Rita Road	A	0.221	A	0.218	A	0.222	A	0.218	A	0.223
3	Tassajara Road/Santa Rita Road	Fallon Road/ El Charro Road	A	0.222	A	0.220	A	0.221	A	0.222	A	0.222
4	Fallon Road/ El Charro Road	Airway Boulevard	A	0.216	A	0.211	A	0.214	A	0.216	A	0.216
5	Airway Boulevard	Isabel Avenue	A	0.202	A	0.202	A	0.201	A	0.201	A	0.202
6	Isabel Avenue	Livermore Avenue	A	0.199	A	0.193	A	0.195	A	0.199	A	0.198
7	Livermore Avenue	Springtown Boulevard/ First Street	A	0.181	A	0.178	A	0.179	A	0.181	A	0.181
8	Springtown Boulevard/ First Street	Vasco Road	A	0.174	A	0.173	A	0.174	A	0.174	A	0.174
9	Vasco Road	Greenville Road	A	0.131	A	0.130	A	0.130	A	0.131	A	0.131
10	Greenville Road	Carroll Road/ Flynn Road	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Notes: N/A = not applicable; LOS = level of service; V/C = volume-to-capacity ratio.  
 Source: Cambridge Systematics, 2017.

**TABLE 3.B-46 AM EASTBOUND I-580 HOV/EXPRESS LANE LEVEL OF SERVICE, 2040 PROJECT CONDITIONS**

#	To	From	No Project Alternative		Conventional BART Project		DMU Alternative (with EMU Option)		Express Bus/BRT Alternative		Enhanced Bus Alternative	
			LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C
1	Dougherty Road/Hopyard Road	Hacienda Drive	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
2	Hacienda Drive	Tassajara Road/Santa Rita Road	A	0.192	A	0.183	A	0.186	A	0.184	A	0.191
3	Tassajara Road/Santa Rita Road	Fallon Road/ El Charro Road	A	0.198	A	0.188	A	0.192	A	0.191	A	0.197
4	Fallon Road/ El Charro Road	Airway Boulevard	A	0.105	A	0.100	A	0.101	A	0.102	A	0.104
5	Airway Boulevard	Isabel Avenue	A	0.102	A	0.097	A	0.098	A	0.099	A	0.101
6	Isabel Avenue	Livermore Avenue	A	0.098	A	0.097	A	0.097	A	0.098	A	0.098
7	Livermore Avenue	Springtown Boulevard/ First Street	A	0.098	A	0.098	A	0.098	A	0.098	A	0.098
8	Springtown Boulevard/ First Street	Vasco Road	A	0.096	A	0.096	A	0.096	A	0.095	A	0.096
9	Vasco Road	Greenville Road	A	0.174	A	0.174	A	0.174	A	0.173	A	0.173
10	Greenville Road	Carroll Road/ Flynn Road	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Notes: N/A = not applicable; LOS = level of service; V/C = volume-to-capacity ratio.  
 Source: Cambridge Systematics, 2017.

**TABLE 3.B-47 PM EASTBOUND I-580 HOV/EXPRESS LANE LEVEL OF SERVICE, 2040 PROJECT CONDITIONS**

#	To	From	No Project Alternative		Conventional BART Project		DMU Alternative (with EMU Option)		Express Bus/BRT Alternative		Enhanced Bus Alternative	
			LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C
1	Dougherty Road/ Hopyard Road	Hacienda Drive	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
2	Hacienda Drive	Tassajara Road/Santa Rita Road	A	0.232	A	0.225	A	0.224	A	0.231	A	0.232
3	Tassajara Road/Santa Rita Road	Fallon Road/ El Charro Road	A	0.239	A	0.232	A	0.231	A	0.238	A	0.238
4	Fallon Road/ El Charro Road	Airway Boulevard	A	0.129	A	0.127	A	0.129	A	0.129	A	0.128
5	Airway Boulevard	Isabel Avenue	A	0.124	A	0.123	A	0.123	A	0.123	A	0.122
6	Isabel Avenue	Livermore Avenue	A	0.128	A	0.128	A	0.128	A	0.128	A	0.128
7	Livermore Avenue	Springtown Boulevard/ First Street	A	0.119	A	0.118	A	0.120	A	0.119	A	0.119
8	Springtown Boulevard/ First Street	Vasco Road	A	0.109	A	0.108	A	0.110	A	0.109	A	0.109
9	Vasco Road	Greenville Road	A	0.167	A	0.165	A	0.166	A	0.167	A	0.167
10	Greenville Road	Carroll Road/ Flynn Road	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Notes: N/A = not applicable; LOS = level of service; V/C = volume-to-capacity ratio.  
 Source: Cambridge Systematics, 2017.

**Conventional BART Project and Build Alternatives.** For the Proposed Project and Build Alternatives, all HOV/express lane freeway segments would operate at acceptable levels during both peak periods in 2040. Therefore, the Proposed Project and Build Alternatives would have no impacts related to HOV/express lane freeway segments in 2040, and no mitigation measures are required. **(NI)**

**Mitigation Measures.** As described above, the Proposed Project and Alternatives would not result in significant impacts related to HOV/express lane freeway segments in 2040, and no mitigation measures are required.

**Local Roadway Intersections**

**Impact TRAN-7: Intersections operating at an unacceptable LOS, under 2025 Project Conditions.**

**(No Project Alternative: NI; Conventional BART Project: SU; DMU Alternative: SU; Express Bus/BRT Alternative: LSM; Enhanced Bus Alternative: NI)**

Table 3.B-48 below presents the results of the intersection LOS analysis for 2025, for the Proposed Project and Build Alternatives and Figures 3.B-10 through 3.B-17 present the intersection LOS results under 2025 conditions.

**TABLE 3.B-48 INTERSECTION DELAY AND LEVEL OF SERVICE, 2025 PROJECT CONDITIONS**

#	Intersection	Time	No Project Alternative		Conventional BART Project		DMU Alternative (with EMU Option)		Express Bus/BRT Alternative		Enhanced Bus Alternative	
			Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
1	Dougherty Road & Amador Valley Road <sup>a</sup>	AM	30.4	C	33.7	C	38.6	D	30.2	C	30.2	C
		PM	35.0	D	38.4	D	43.9	D	35.3	D	35.0	C
2	Hopyard Road/Dougherty Road & Dublin Boulevard <sup>a</sup>	AM	43.5	D	46.4	D	50.4	D	43.7	D	47.4	D
		PM	106.9	F	109.8	F	111.2	F	98.6	F	106.7	F
3	Dougherty Road/Hopyard Road & I-580 WB Ramps <sup>a</sup>	AM	11.0	B	10.5	B	10.9	B	10.9	B	10.9	B
		PM	17.4	B	14.2	B	18.6	B	22.2	C	17.7	B
4	Hopyard Road/Dougherty Road & I-580 EB Ramps	AM	37.8	D	38.7	D	40.8	D	37.9	D	37.6	D
		PM	33.5	C	32.2	C	34.4	C	26.8	C	34.0	C
5	Hopyard Road & Owens Road	AM	33.0	C	34.5	C	33.8	C	33.0	C	33.1	C
		PM	108.7	F	115.1	F	115.2	F	107.6	F	109.1	F

TABLE 3.B-48 INTERSECTION DELAY AND LEVEL OF SERVICE, 2025 PROJECT CONDITIONS

#	Intersection	Time	DMU									
			No Project Alternative		Conventional BART Project		Alternative (with EMU Option)		Express Bus/BRT Alternative		Enhanced Bus Alternative	
			Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
6	Hopyard Road & Stoneridge Drive	AM	30.1	C	28.9	C	30.4	C	30.3	C	30.3	C
		PM	37.0	D	39.1	D	38.4	D	37.1	D	37.1	D
7	Hopyard Road & Las Positas Boulevard	AM	24.1	C	24.0	C	24.0	C	24.0	C	24.1	C
		PM	27.2	C	27.3	C	27.3	C	27.2	C	27.8	C
8	Willow Road & Owens Road	AM	11.7	B	21.8	C	11.3	B	11.7	B	11.7	B
		PM	22.7	C	20.0	C	16.5	B	13.1	B	22.7	C
9	Hacienda Drive & Dublin Boulevard <sup>a</sup>	AM	24.0	C	24.0	C	24.0	C	24.0	C	23.9	C
		PM	29.1	C	28.9	C	29.0	C	29.1	C	29.1	C
10	Hacienda Drive & Martinelli Boulevard/Hacienda Crossings <sup>a</sup>	AM	19.2	B	19.2	B	19.2	B	19.2	B	19.2	B
		PM	25.5	C	23.6	C	24.3	C	34.8	C	24.7	C
11	Hacienda Drive & I-580 WB Ramps <sup>a</sup>	AM	7.4	A	7.2	A	7.4	A	7.3	A	7.4	A
		PM	8.5	A	7.3	A	7.3	A	10.4	B	8.1	A
12	Hacienda Drive & I-580 EB Ramps	AM	17.4	B	21.1	C	17.4	B	21.1	C	18.9	B
		PM	20.3	C	20.3	C	20.5	C	32.9	C	20.3	C
13	Hacienda Drive & Owens Road	AM	27.5	C	26.5	C	27.3	B	24.7	C	28.0	B
		PM	32.5	C	31.1	C	31.8	C	30.5	C	33.5	C
14	Tassajara Road & Dublin Boulevard <sup>a</sup>	AM	43.0	D	41.1	D	41.3	D	41.6	D	42.1	D
		PM	42.0	D	41.6	D	41.7	D	41.9	D	42.3	D
15	Tassajara Road & I-580 WB Ramps <sup>a</sup>	AM	8.8	A	9.5	A	8.7	A	8.8	A	8.8	A
		PM	9.5	A	9.4	A	9.5	A	9.5	A	9.5	A
16	Santa Rita Road & I-580 EB Ramps/Pimlico Drive	AM	17.8	B	18.3	B	17.8	B	17.9	B	17.8	B
		PM	30.6	C	26.4	C	30.6	C	32.8	C	30.5	C
17	Santa Rita Road & Valley Avenue	AM	21.7	C	21.9	C	21.9	C	21.7	C	21.8	C
		PM	45.8	D	46.9	D	48.6	D	46.6	D	45.5	D
18	Bernal Avenue/Valley Avenue & Stanley Boulevard	AM	37.4	D	40.5	D	37.5	D	37.4	D	37.4	D
		PM	32.8	C	32.7	C	32.8	C	32.7	C	32.8	C
19	Fallon Road & Dublin Boulevard <sup>a</sup>	AM	48.2	D	43.6	D	41.2	D	45.2	D	47.1	D
		PM	21.4	C	20.4	C	20.8	C	25.8	C	21.2	C



**TABLE 3.B-48 INTERSECTION DELAY AND LEVEL OF SERVICE, 2025 PROJECT CONDITIONS**

#	Intersection	Time	DMU									
			No Project Alternative		Conventional BART Project		Alternative (with EMU Option)		Express Bus/BRT Alternative		Enhanced Bus Alternative	
			Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
20	El Charro Road/Fallon Road & I-580 WB Ramps <sup>a</sup>	AM	8.0	A	8.6	A	8.1	A	8.0	A	8.0	A
		PM	9.4	A	9.3	A	9.5	A	9.2	A	9.4	A
21	El Charro Road & I-580 EB Ramps	AM	8.2	A	8.3	A	8.6	A	8.2	A	8.3	A
		PM	8.2	A	8.2	A	8.2	A	8.1	A	8.2	A
22	El Charro Road & Stoneridge Drive/Jack London Boulevard	AM	26.8	C	16.5	B	16.5	B	26.8	C	26.7	C
		PM	18.3	B	18.1	B	18.1	B	16.6	B	18.3	B
23	Stanley Boulevard & El Charro Road	AM	N/A <sup>2</sup>	N/A <sup>2</sup>	N/A <sup>2</sup>	N/A <sup>2</sup>	N/A <sup>2</sup>	N/A <sub>2</sub>	N/A <sup>2</sup>	N/A <sub>2</sub>	N/A <sup>2</sup>	N/A <sub>2</sub>
		PM	N/A <sup>2</sup>	N/A <sup>2</sup>	N/A <sup>2</sup>	N/A <sup>2</sup>	N/A <sup>2</sup>	N/A <sub>2</sub>	N/A <sup>2</sup>	N/A <sub>2</sub>	N/A <sup>2</sup>	N/A <sub>2</sub>
24	Airway Boulevard/Drive way & North Canyons Parkway	AM	78.7	E	38.3	D	63.2	E	74.0	E	75.5	E
		PM	13.6	B	11.9	B	12.6	B	13.1	B	13.8	B
25	Airway Boulevard & I-580 WB Ramps	AM	20.8	C	13.7	B	25.5	C	20.4	C	17.7	B
		PM	5.4	A	5.0	A	4.9	A	4.2	A	5.0	A
26	Airway Boulevard & I-580 EB Ramps/Kitty Hawk Road	AM	28.6	C	38.3	D	25.5	C	31.1	C	31.0	C
		PM	27.9	C	25.6	C	25.8	C	23.0	C	24.4	C
27	Collier Canyon Road & North Canyons Parkway/Portola Avenue	AM	22.9	C	25.4	C	22.5	C	23.4	C	25.4	C
		PM	25.6	C	24.6	C	24.7	C	23.1	C	25.7	C
28	Isabel Avenue/Campus Hill Drive & Portola Avenue	AM	27.9	C	27.6	C	27.8	C	28.1	C	28.0	C
		PM	25.0	C	23.9	C	24.1	C	24.7	C	25.1	C
29	Isabel Avenue & I-580 WB Ramps	AM	10.8	B	17.9	B	17.2	B	11.3	B	11.3	B
		PM	9.9	A	9.9	A	9.9	A	13.0	B	9.9	A
30	Isabel Avenue & I-580 EB Ramps	AM	6.6	A	8.0	A	7.3	A	5.9	A	5.9	A
		PM	6.6	A	8.1	A	6.5	A	5.1	A	6.7	A

TABLE 3.B-48 INTERSECTION DELAY AND LEVEL OF SERVICE, 2025 PROJECT CONDITIONS

#	Intersection	Time	DMU									
			No Project Alternative		Conventional BART Project		Alternative (with EMU Option)		Express Bus/BRT Alternative		Enhanced Bus Alternative	
			Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
31	Isabel Avenue & Airway Boulevard	AM	26.7	C	32.9	C	30.5	C	27.2	C	27.4	C
		PM	31.7	C	72.8	E	70.9	E	30.6	C	30.2	C
32	Isabel Avenue & Jack London Boulevard	AM	37.1	D	36.6	D	34.0	C	34.0	C	34.1	C
		PM	43.1	D	45.8	D	47.0	D	43.4	D	45.8	D
33	Isabel Avenue Connector & Stanley Boulevard	AM	15.7	B	16.3	B	15.7	B	15.8	B	16.0	B
		PM	15.8	B	15.2	B	15.2	B	15.2	B	15.2	B
34	Murrieta Boulevard/Drive way & Portola Avenue	AM	14.1	B	16.8	B	16.1	B	14.1	B	14.1	B
		PM	20.2	C	29.0	C	30.1	C	19.5	B	20.3	C
35	Murrieta Boulevard & Jack London Boulevard	AM	17.9	B	17.9	B	17.9	B	17.8	B	17.8	B
		PM	20.5	C	27.4	C	26.4	C	19.5	B	20.5	C
36	Murrieta Boulevard & Stanley Boulevard	AM	40.3	D	37.7	D	37.3	D	38.0	D	38.4	D
		PM	29.3	C	29.2	C	29.2	C	29.1	C	29.3	C
37	Livermore Avenue & I-580 WB Ramps	AM	21.4	C	23.6	C	21.5	C	21.4	C	21.4	C
		PM	39.3	D	13.7	B	26.3	C	11.4	B	12.3	B
38	Livermore Avenue & I-580 EB Ramps	AM	17.5	B	18.8	B	21.1	C	17.5	B	17.5	B
		PM	108.2	F	112.8	F	101.4	F	110.0	F	107.9	F
39	Livermore Avenue & Portola Avenue	AM	39.3	D	43.4	D	41.1	D	39.4	D	39.3	D
		PM	37.3	D	54.1	D	43.3	D	35.6	D	36.8	D
40	First Street/ Springtown Boulevard & I-580 WB Ramps	AM	16.3	B	9.2	A	11.6	B	16.3	B	16.3	B
		PM	7.5	A	7.5	A	7.4	A	5.2	A	10.6	B
41	First Street & I-580 EB Ramps	AM	9.8	A	16.6	B	10.4	B	9.8	A	9.8	A
		PM	30.4	C	31.7	C	32.8	C	33.8	C	34.0	C
42	First Street & Mines Road	AM	24.2	C	24.5	C	24.4	C	24.6	C	24.2	C
		PM	48.6	D	56.4	E	54.8	D	45.3	D	52.0	D
43	Vasco Road / I-580 WB Ramps	AM	1.0	A	1.0	A	1.0	A	1.0	A	1.0	A
		PM	1.1	A	1.1	A	1.1	A	1.1	A	1.1	A

TABLE 3.B-48 INTERSECTION DELAY AND LEVEL OF SERVICE, 2025 PROJECT CONDITIONS

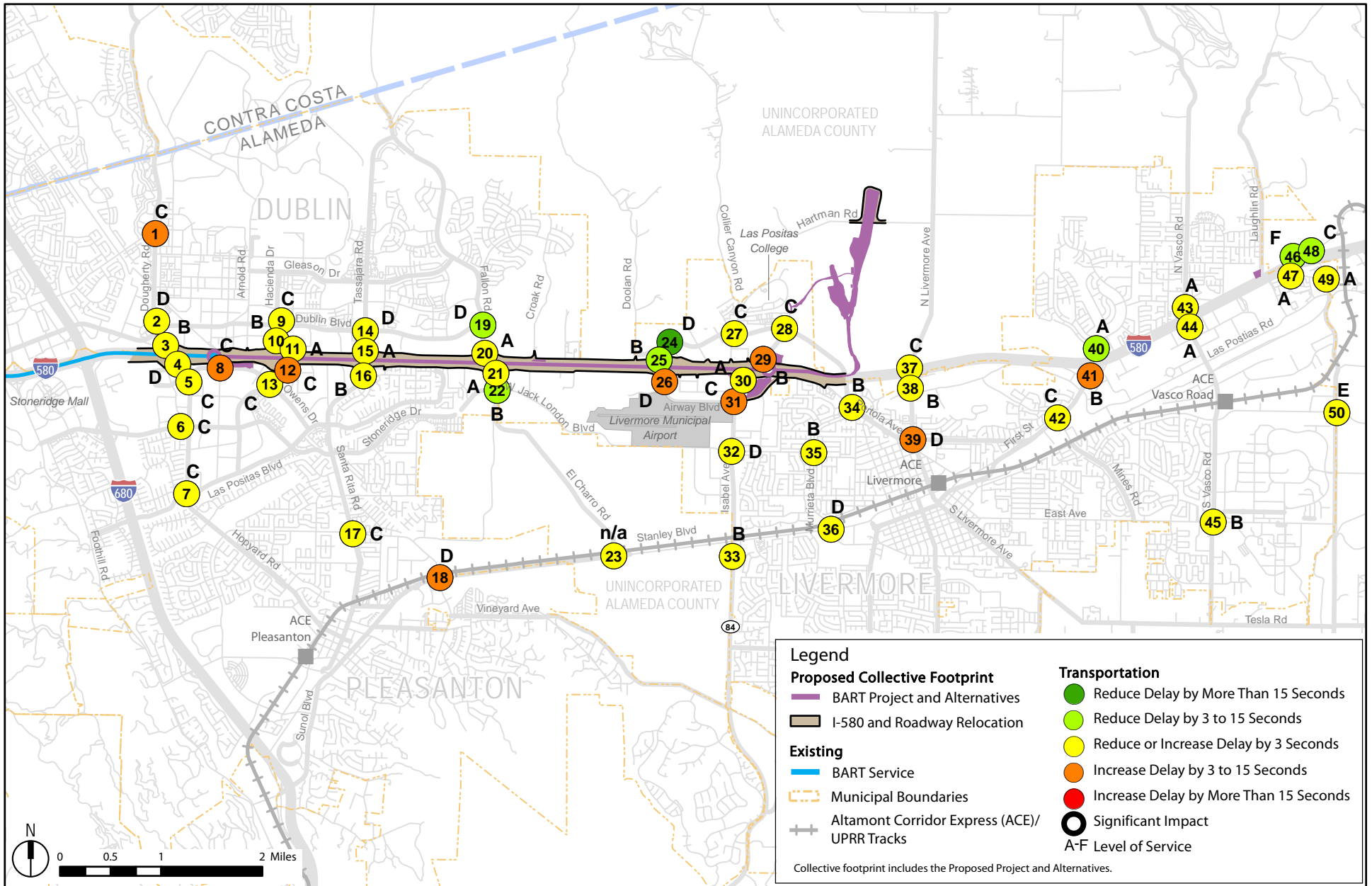
#	Intersection	Time	DMU									
			No Project Alternative		Conventional BART Project		Alternative (with EMU Option)		Express Bus/BRT Alternative		Enhanced Bus Alternative	
			Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
44	Vasco Road / I-580 EB Ramps	AM	0.3	A	0.3	A	0.3	A	0.3	A	0.3	A
		PM	0.7	A	0.7	A	0.7	A	0.7	A	0.7	A
45	Vasco Road & East Avenue	AM	18.8	B	17.6	B	19.0	B	18.9	B	18.8	B
		PM	42.2	D	42.5	D	39.8	D	44.5	D	41.6	D
46	Altamont Pass Road & I-580 WB Ramps	AM	123.8	F	118.3	F	102.2	F	110.2	F	112.3	F
		PM	7.0	A	6.8	A	6.8	A	6.3	A	6.4	A
47	Southfront Road & I-580 EB Ramps	AM	10.0	A	9.8	A	9.9	A	10.0	A	10.0	A
		PM	13.8	B	13.8	B	13.7	B	14.3	B	14.6	B
48	Greenville Road /Altamont Pass Road	AM	35.1	D	32.1	C	37.1	D	32.6	C	32.3	C
		PM	79.8	E	<b>81.0</b>	<b>F</b>	<b>81.0</b>	<b>F</b>	<b>80.2</b>	<b>F</b>	79.6	E
49	Greenville Road & Southfront Road	AM	8.9	A	9.9	A	8.9	A	8.9	A	8.9	A
		PM	14.2	B	15.8	B	15.2	B	14.7	B	14.2	B
50	Greenville Road / Patterson Pass Road	AM	61.7	E	63.6	E	55.2	E	58.7	E	58.6	E
		PM	132.2	F	136.6	F	129.1	F	127.4	F	137.1	F

Notes: EB = eastbound; WB = westbound; LOS = level of service.

**Bold**/gray shading indicates intersections having a significant impact; *italic*/gray shading indicates policy-exempt intersections having a less-than-significant impact.

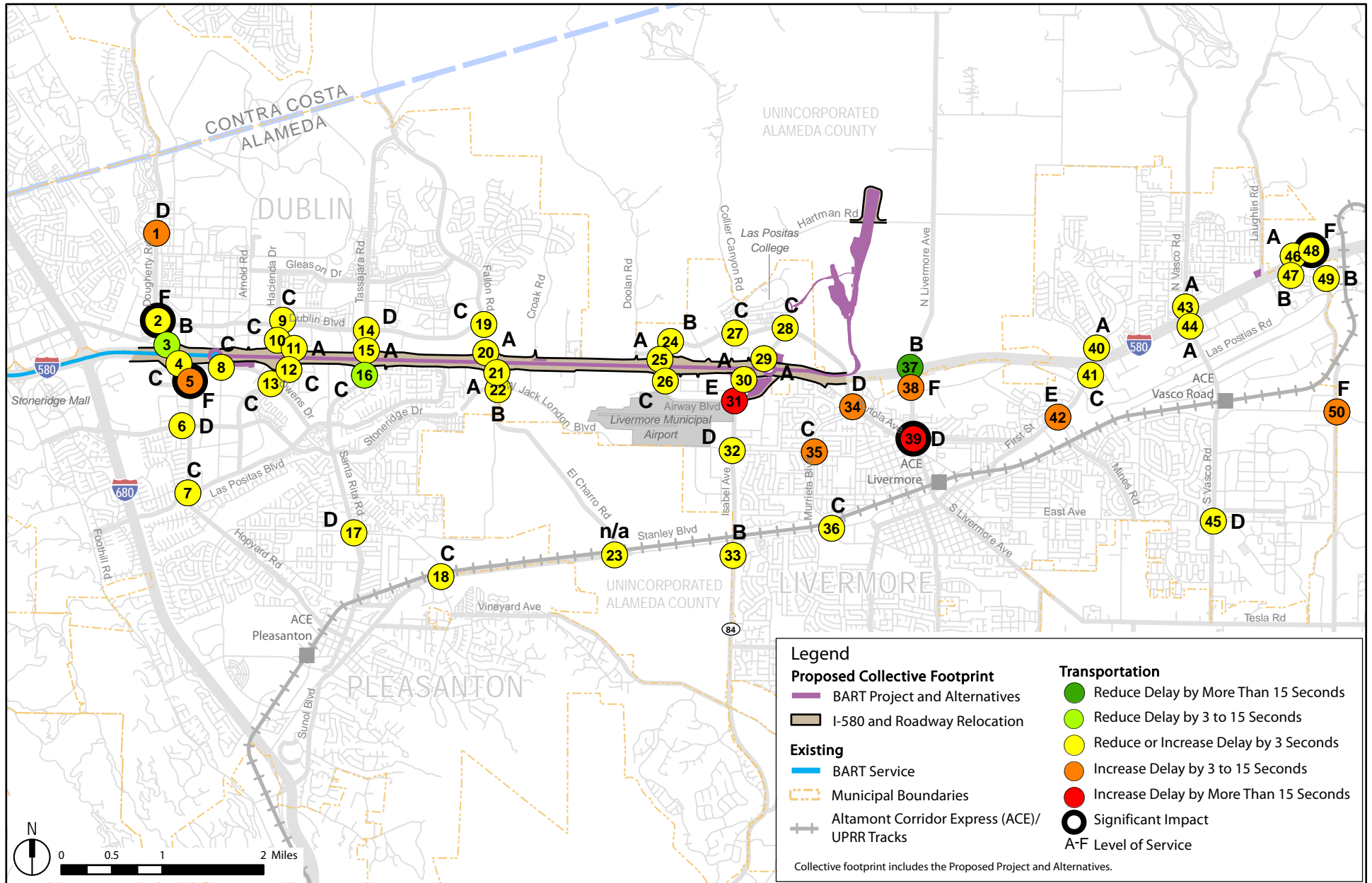
<sup>a</sup>The significant impact criteria of the Cities of Dublin and Pleasanton use added vehicle trips as a metric rather than increased delay.

Source: Cambridge Systematics, 2017.



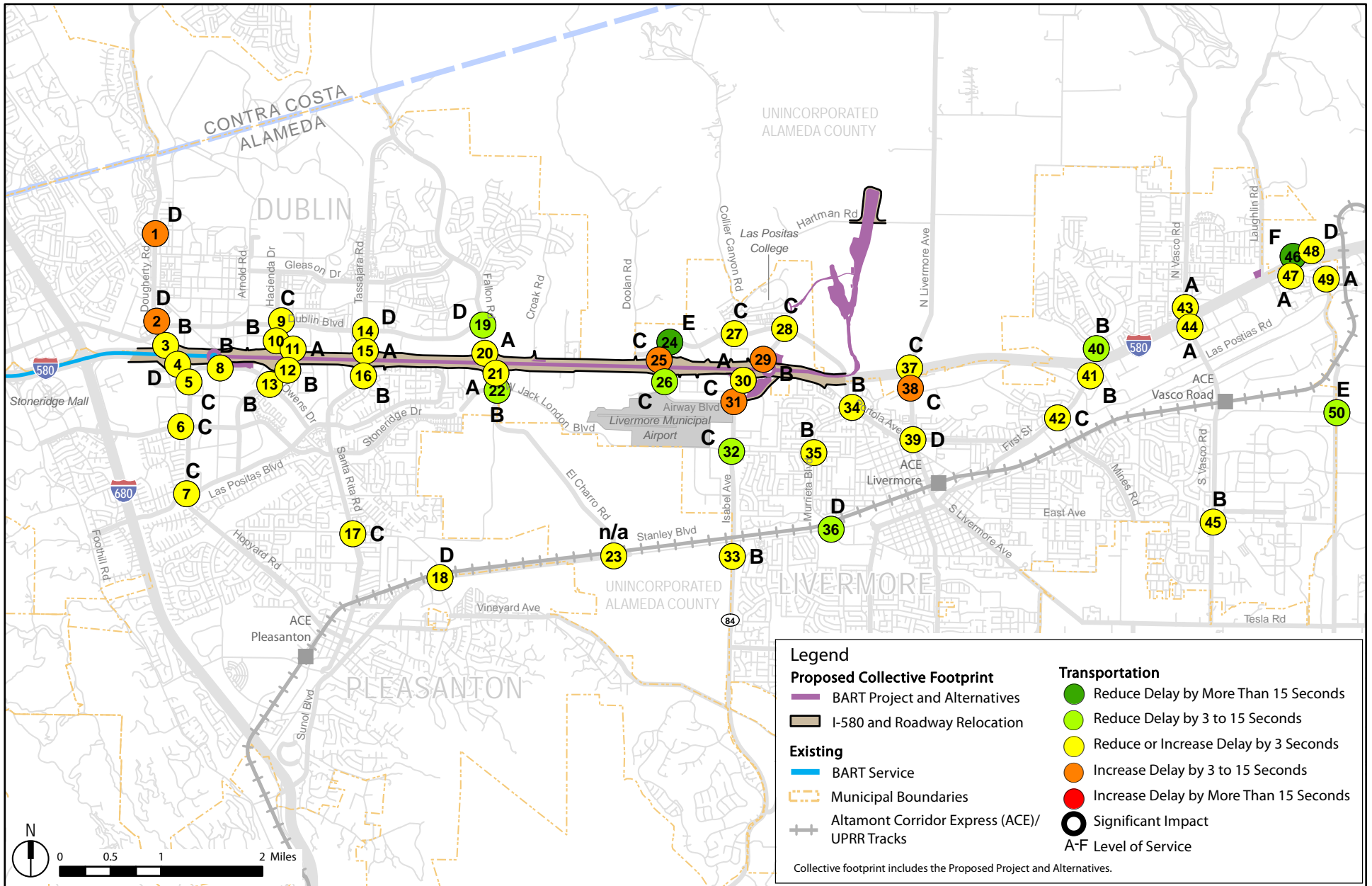
Source: Arup, 2017.

Figure 3.B-10  
 Transportation  
 Intersection LOS and Change in AM Delay  
 2025 Conventional BART Project



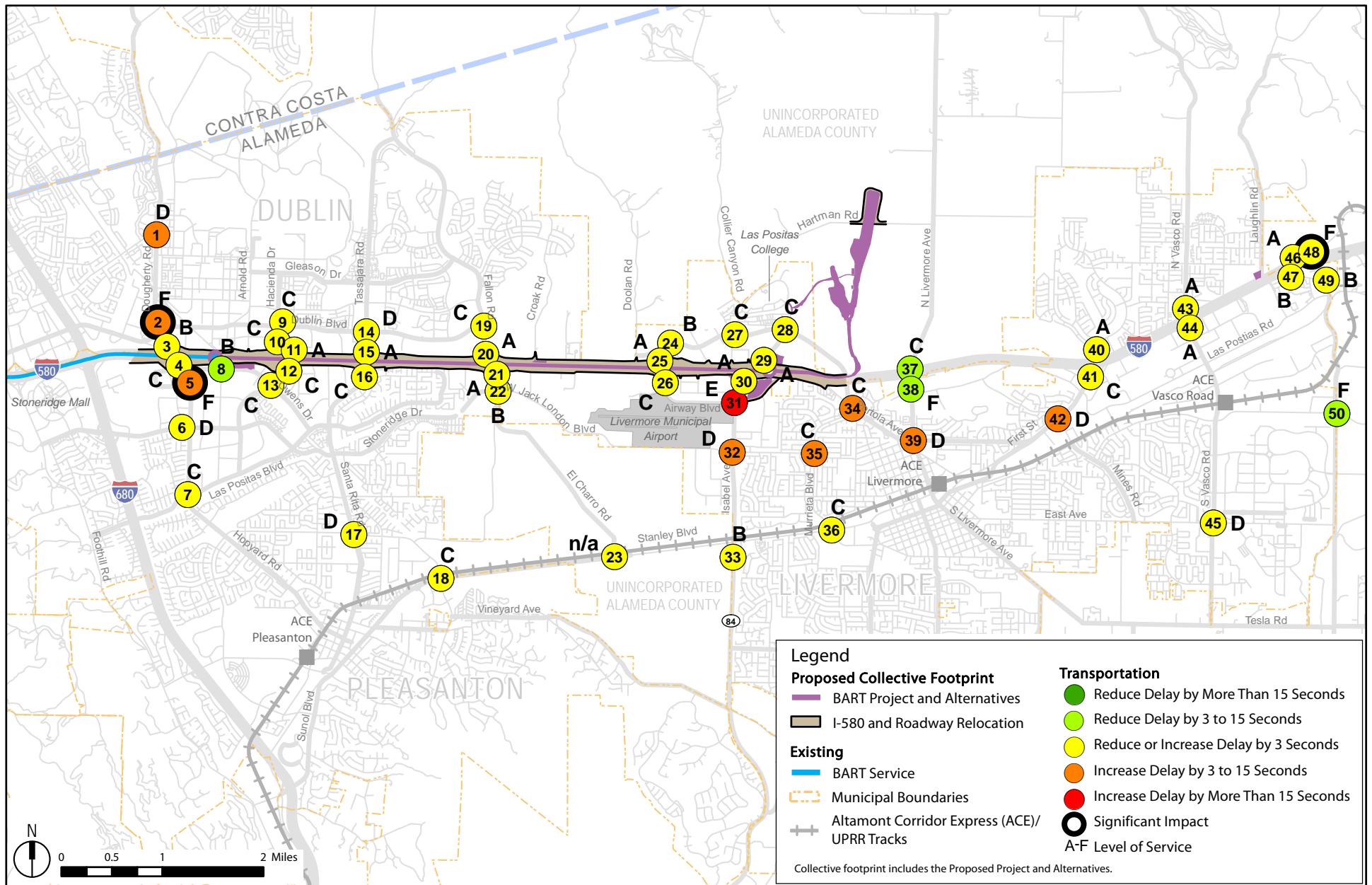
Source: Arup, 2017.

Figure 3.B-11  
 Transportation  
 Intersection LOS and Change in PM Delay  
 2025 Conventional BART Project



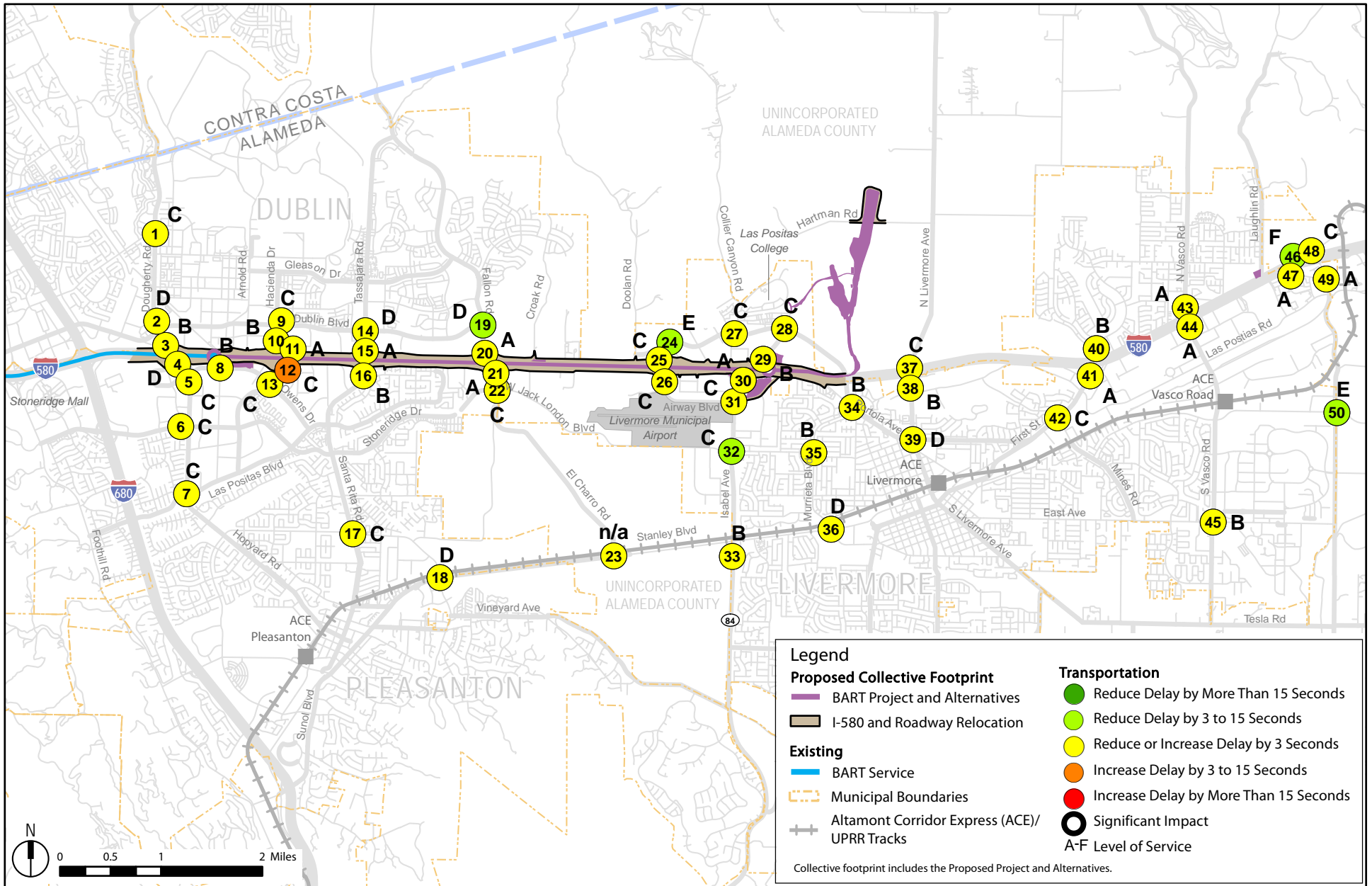
Source: Arup, 2017.

Figure 3.B-12  
 Transportation  
 Intersection LOS and Change in AM Delay  
 2025 DMU Alternative



Source: Arup, 2017.

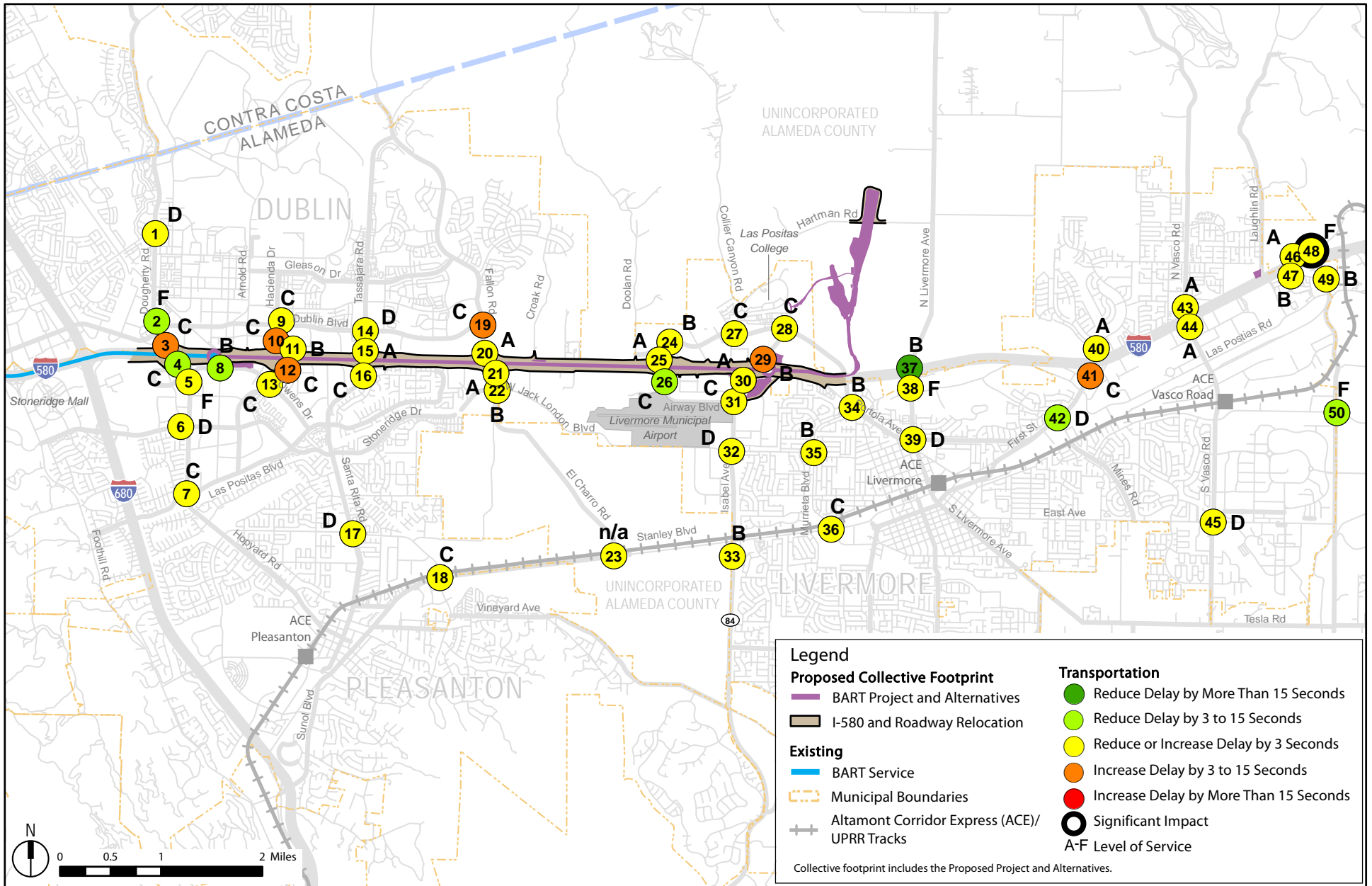
Figure 3.B-13  
 Transportation  
 Intersection LOS and Change in PM Delay  
 2025 DMU Alternative



Source: Arup, 2017.

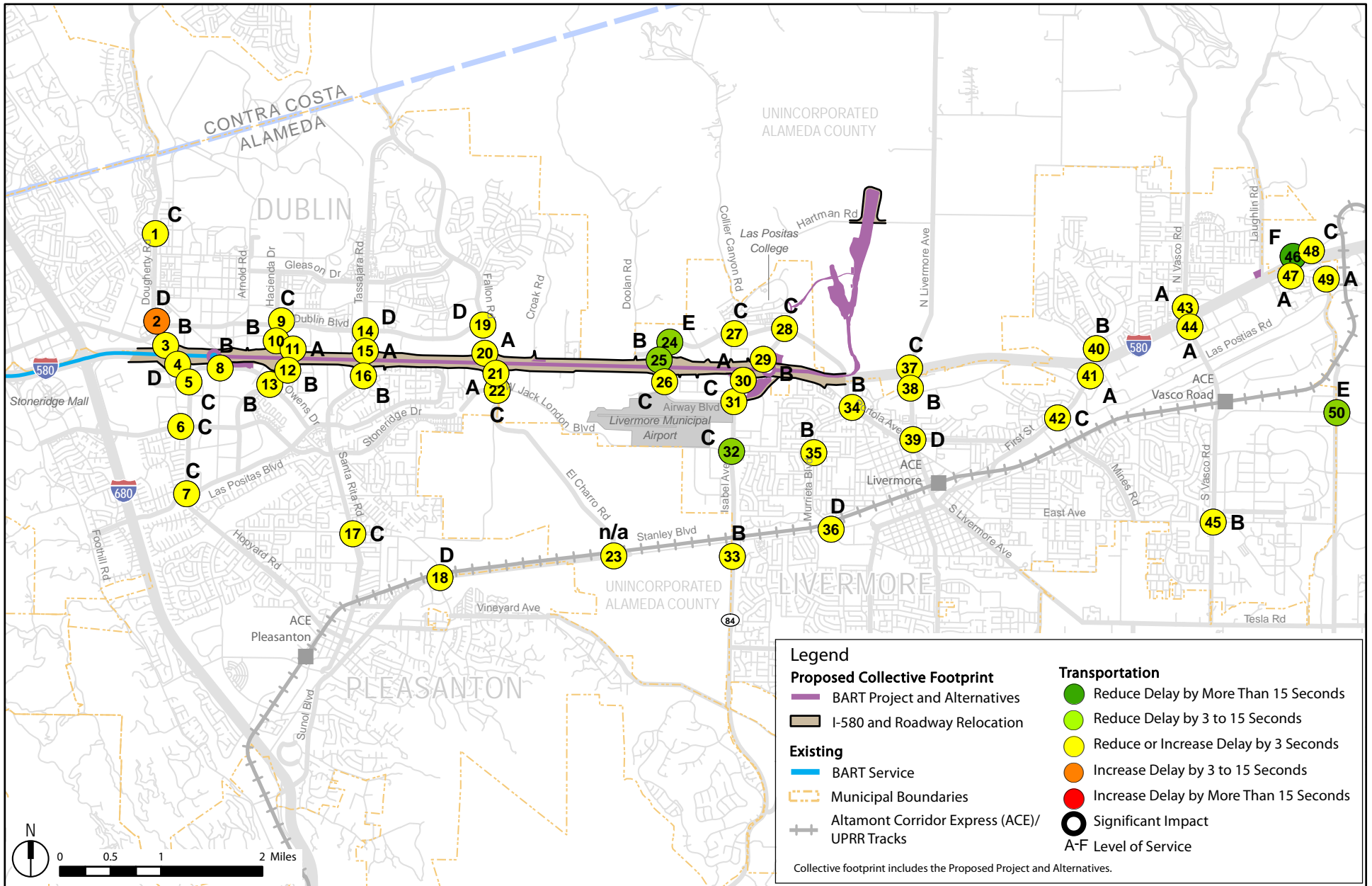
Figure 3.B-14  
 Transportation  
 Intersection LOS and Change in AM Delay  
 2025 Express Bus/BRT Alternative





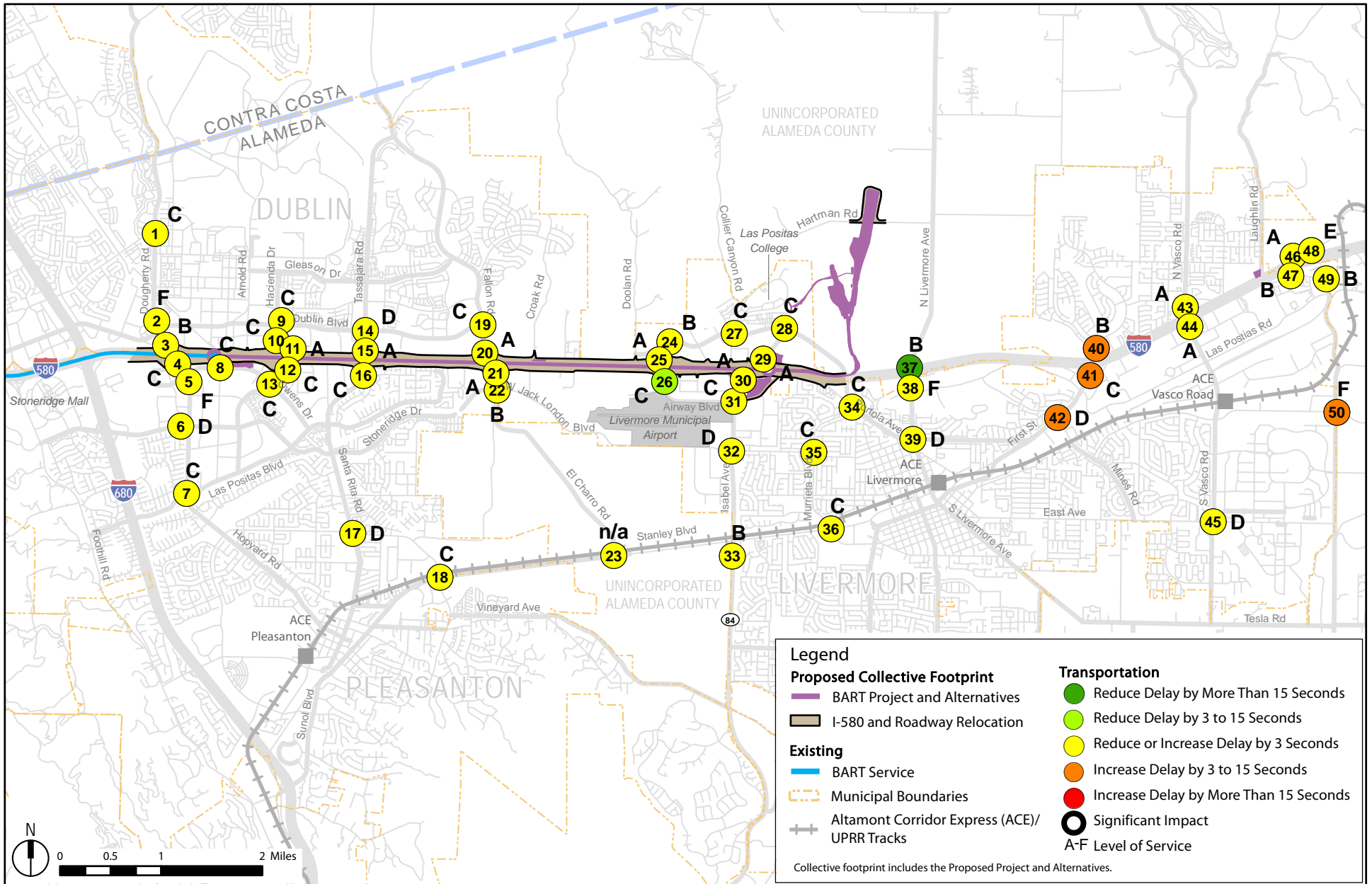
Source: Arup, 2017.

Figure 3.B-15  
 Transportation  
 Intersection LOS and Change in PM Delay  
 2025 Express Bus/BRT Alternative



Source: Arup, 2017.

Figure 3.B-16  
 Transportation  
 Intersection LOS and Change in AM Delay  
 2025 Enhanced Bus Alternative



Source: Arup, 2017.

Figure 3.B-17  
 Transportation  
 Intersection LOS and Change in PM Delay  
 2025 Enhanced Bus Alternative

**No Project Alternative.** The 2025 No Project Alternative is the same as baseline conditions (i.e., 2025 No Project Conditions). Therefore, the 2025 No Project Alternative would have no impacts related to intersections operating at unacceptable levels. **(NI)**

**Conventional BART Project.** Under the Proposed Project in 2025, six intersections would exceed the standard for significant impacts. However, two of these intersections are exempt by policy from applicable LOS standards; therefore, impacts at these intersections would be considered less than significant. One of the four remaining intersections that experience impacts above the significant impact threshold may also be exempt, but is treated here as non-exempt until exemption is confirmed by the relevant jurisdiction.

The policy-exempt intersections are as follows:

- **Isabel Avenue & Airway Boulevard (Intersection #31) PM.** Under 2025 Project Conditions, this intersection would operate at an LOS E with a delay of 72.8 seconds in the PM peak period. However, this intersection is designated as exempt from the City of Livermore's LOS standard because this intersection is near a freeway interchange.
- **First Street & Mines Road (Intersection #42) PM.** Under 2025 Project Conditions, this intersection would operate at an LOS E with a delay of 56.4 seconds in the PM peak period. However, this intersection is exempt from the City of Livermore's LOS standard because of environmental constraints, ROW constraints or cut-through traffic volumes or other City of Livermore policies that prevent the implementation of improvements that would achieve the City's LOS standards.

Significant impacts would occur at four intersections, as follows:

- **Hopyard Road/Dougherty Road & Dublin Boulevard (Intersection #2) PM.** Under 2025 Project Conditions, this intersection would operate at an LOS F with a delay of 109.8 seconds in the PM peak period. This intersection also has 68 additional trips Project Conditions compared to No Project Conditions in the PM peak period, which is greater than the City of Dublin's threshold of 50 additional trips.
- **Hopyard Road & Owens Road (Intersection #5) PM.** Under 2025 Project Conditions, this intersection would operate at an LOS F with a delay of 115.1 seconds in the PM peak period. This intersection also has 31 additional trips Project Conditions compared to No Project Conditions in the PM peak period, which is greater than the City of Pleasanton's threshold of 10 additional trips. This intersection is designated a Gateway Intersection and may be exempt from the City of Pleasanton's LOS standard if vehicular capacity improvements would be contrary to other City of Pleasanton goals. If its exempt status is confirmed after consultation with the City of Pleasanton, there would be no impact and no mitigation would be required.
- **Livermore Avenue & Portola Avenue (Intersection #39) PM.** Under 2025 Project Conditions, this intersection would operate at an LOS D with a delay of 54.1 seconds

in the PM peak period, which is greater than 45 seconds, the significance threshold identified for this intersection.

- **Greenville Road & Altamont Pass Road (Intersection #48) PM.** Under 2025 Project Conditions, this intersection would operate at an LOS F with a delay of 81.0 seconds in the PM peak period, which is greater than 45 seconds, the significance threshold identified for this intersection.

Significant impacts at Intersection #2 and Intersection #48 would be reduced to less than significant with implementation of **Mitigation Measure TRAN-7a**, which requires improvements for turning and through lanes. Significant impacts at Intersection #5 and #39 would also be reduced with implementation **Mitigation Measure TRAN-7a**, which would include creating a full eight-phase signal operation at Intersection #5 and the addition of a second northbound left-turn lane at Intersection #39. However, these mitigations would not reduce the respective impacts at Intersection #5 and Intersection #39 to less than significant, and further improvements at these intersections would be infeasible due to physical constraints. Impacts at Intersection #5 and Intersection #39 would be significant and unavoidable. (SU)

**DMU Alternative.** Under the DMU Alternative in 2025, five intersections would exceed the standard for significant impacts. Two of these intersections are exempt by policy from applicable LOS standards, and are therefore considered to experience less-than-significant impacts. One of the three remaining intersections that experience impacts above the significant impact threshold may also be exempt, but is treated here as non-exempt until exemption is confirmed by the relevant jurisdiction.

The policy-exempt intersections are as follows:

- **Isabel Avenue & Airway Boulevard (Intersection #31) PM.** Under 2025 Project Conditions, this intersection would operate at an LOS E with a delay of 70.9 seconds in the PM peak period. However, this intersection is designated as exempt from the City of Livermore's LOS standard because this intersection is near a freeway interchange.
- **First Street & Mines Road (Intersection #42) PM.** Under 2025 Project Conditions, this intersection would operate at an LOS E with a delay of 54.8 seconds in the PM peak period. However, this intersection is exempt from the City of Livermore's LOS standard because of environmental constraints, ROW constraints or cut-through traffic volumes or other City of Livermore policies that prevent the implementation of improvements that would achieve the City's LOS standards.

Significant impacts would occur at three intersections, as follows:

- **Hopyard Road/Dougherty Road & Dublin Boulevard (Intersection #2) AM/PM.** Under 2040 Project Conditions, this intersection would operate at an LOS F with a delay of 106.7 seconds in the AM peak and an LOS F with a delay of 164.8 seconds in

the PM peak period. This intersection also has 189 additional trips under the DMU Alternative compared to No Project Conditions in the PM peak period, which is greater than the City of Dublin's threshold of 50 additional trips.

- **Hopyard Road & Owens Road (Intersection #5) PM.** Under 2025 Project Conditions, this intersection would operate at an LOS F with a delay of 115.2 seconds in the PM peak period. This intersection also has 43 additional trips under Project Conditions compared to No Project Conditions in the PM peak period, which is greater than the City of Pleasanton's threshold of 10 additional trips. This intersection is designated a Gateway Intersection and may be exempt from the City of Pleasanton's LOS standard if vehicular capacity improvements would be contrary to other City of Pleasanton goals. If its exempt status is confirmed after consultation with the City of Pleasanton, there would be no impact and no mitigation would be required.
- **Greenville Road & Altamont Pass Road (Intersection #48) PM.** Under 2025 Project Conditions, this intersection would operate at an LOS F with a delay of 81.0 seconds in the PM peak period, which is greater than 45 seconds, the significance threshold identified for this intersection.

Significant impacts at Intersection #2 and Intersection #48 would be reduced to less than significant with implementation of **Mitigation Measure TRAN-7b**, which requires improvements for turning and through lanes. Significant impacts at Intersection #5 would also be reduced with implementation **Mitigation Measure TRAN-7b**, which would include creating a full eight-phase signal operation at Intersection #5. However, this mitigation would not reduce the impact at Intersection #5 to less than significant, and further improvements at this intersection would be infeasible due to physical constraints. Impacts at Intersection #5 would be significant and unavoidable. **(SU)**

**Express Bus/BRT Alternative.** Under the Express Bus/BRT Alternative in 2025, one intersection would operate at unacceptable levels worse than under No Project Conditions. The following intersection would experience a significant impact:

- **Greenville Road & Altamont Pass Road (Intersection #48) PM.** Under the Express Bus/BRT Alternative 2025, this intersection would operate at an LOS F with a delay of 80.2 seconds in the PM peak period, which is greater than 45 seconds, the significance threshold identified for this intersection.

Significant impacts at Intersection# 48 would be reduced to less than significant with implementation of **Mitigation Measure TRAN-7c**, which requires improvements for turning and through lanes. **(LSM)**

**Enhanced Bus Alternative.** Under the Enhanced Bus Alternative in 2025, no operations would degrade below the threshold of significance. Therefore, the Enhanced Bus

Alternative would have no impacts related to intersections in 2025, and no mitigation measures are required. **(NI)**

**Mitigation Measures.** As described above, the Proposed Project, DMU Alternative, and Express Bus/BRT Alternative would have potentially significant impacts to intersections in 2025. For the Proposed Project, potential impacts would be reduced with implementation of **Mitigation Measure TRAN-7a**, which would require improvements at affected intersections. However, improvements at Intersection #5 and Intersection #39 would not be sufficient to reduce impacts to a less-than-significant level, and further intersection improvements would not be feasible. Therefore, the Proposed Project would result in a significant and unavoidable impact.

For the DMU Alternative, potential impacts would be reduced with implementation of **Mitigation Measure TRAN-7b**, which would require improvements at affected intersections. However, improvements at Intersection #5 would not be sufficient to reduce impacts to a less-than-significant level, and further intersection improvements would not be feasible. Therefore, the DMU Alternative would result in a significant and unavoidable impact.

For the Express Bus/BRT Alternative, potential impacts would be reduced to a less-than-significant level with implementation of **Mitigation Measure TRAN-7c**, which requires improvements for turning and through lanes.

As described above, the Enhanced Bus Alternative would not result in significant impacts, and no mitigation measures are required for this alternative.

**Mitigation Measure TRAN-7a: Improvements for Intersections #2, #5, #39, and #48 under 2025 Project Conditions (Conventional BART Project).**

BART shall coordinate with local jurisdictions to implement and contribute its fair share toward funding the following improvements at the following intersections:

- Dougherty Road & Dublin Boulevard (Intersection #2) – Add a third southbound left-turn lane and a second westbound right-turn lane.
- Hopyard Road & Owens Road (Intersection #5) – Create a full eight-phase signal operation. Alternatively, if this intersection is confirmed to be exempt from the City of Pleasanton’s LOS standard following consultation with the City of Pleasanton, no mitigation is required.
- Livermore Avenue & Portola Avenue (Intersection #39) – Add a second northbound left-turn lane.
- Greenville Road & WB I-580 Ramps (Intersection #48) – Add a second eastbound through lane.

**Mitigation Measure TRAN-7b: Improvements for Intersections #2, #5, and #48 under 2025 Project Conditions (DMU Alternative/EMU Option).**

BART shall coordinate with local jurisdictions to implement and contribute its fair share toward funding the following improvements at the following intersections:

- Dougherty Road & Dublin Boulevard (Intersection #2) – Add a third southbound left-turn lane and a second westbound right-turn lane.
- Hopyard Road & Owens Road (Intersection #5) – Create a full eight-phase signal operation. Alternatively, if this intersection is confirmed to be exempt from the City of Pleasanton’s LOS standard following consultation with the City, no mitigation is required.
- Greenville Road & WB I-580 Ramps (Intersection #48) – Add a second eastbound through lane.

**Mitigation Measure TRAN-7c: Improvements for Intersection #48 under 2025 Project Conditions (Express Bus/BRT Alternative).**

BART shall coordinate with local jurisdictions to implement and contribute its fair share toward funding the following improvements at the following intersection:

- Greenville Road & WB I-580 Ramps (Intersection #48) – Add a second eastbound through lane.

***Impact TRAN-8: Intersections operating at an unacceptable LOS, under 2040 Project Conditions.***

***(No Project Alternative: NI; Conventional BART Project: SU; DMU Alternative: SU; Express Bus/BRT Alternative: SU; Enhanced Bus Alternative: NI)***

Table 3.B-49 below presents the results of the intersection LOS analysis for 2040, for the Proposed Project and Build Alternatives.



TABLE 3.B-49 INTERSECTION DELAY AND LEVEL OF SERVICE, 2040 PROJECT CONDITIONS

#	Intersection	Time	DMU									
			No Project Alternative		Conventional BART Project		Alternative (with EMU Option)		Express Bus/BRT Alternative		Enhanced Bus Alternative	
			Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
1	Dougherty Road & Amador Valley Road <sup>a</sup>	AM	98.1	F	150.1	F	134.0	F	101.2	F	103.5	F
		PM	32.6	C	37.7	D	38.9	D	33.3	C	32.9	C
2	Hopyard Road/Dougherty Road & Dublin Boulevard <sup>a</sup>	AM	101.6	F	106.4	F	106.7	F	99.3	F	100.1	F
		PM	147.9	F	173.8	F	164.8	F	150.2	F	147.4	F
3	Dougherty Road/Hopyard Road & I-580 WB Ramps <sup>a</sup>	AM	18.1	B	18.6	B	18.2	B	18.3	B	18.1	B
		PM	19.1	B	18.0	B	18.9	B	20.4	C	20.5	C
4	Hopyard Road/Dougherty Road & I-580 EB Ramps	AM	42.5	D	54.8	D	47.9	D	47.8	D	42.8	D
		PM	46.3	D	45.4	D	43.1	D	43.2	D	42.6	D
5	Hopyard Road & Owens Road	AM	32.1	C	35.1	D	33.3	C	31.7	C	31.9	C
		PM	100.7	F	107.6	F	98.7	F	101.6	F	101.3	F
6	Hopyard Road & Stoneridge Drive	AM	32.4	C	36.1	D	34.4	C	34.2	C	33.5	C
		PM	39.3	D	40.8	D	40.1	D	39.4	D	38.7	D
7	Hopyard Road & Las Positas Boulevard	AM	25.9	C	24.8	C	26.0	C	25.6	C	25.0	C
		PM	32.4	C	33.1	C	32.5	C	32.6	C	32.3	C
8	Willow Road & Owens Road	AM	12.4	B	11.6	B	11.7	B	12.5	B	12.5	B
		PM	22.4	C	21.0	C	21.8	C	23.4	C	22.5	C
9	Hacienda Drive & Dublin Boulevard <sup>a</sup>	AM	37.4	D	38.6	D	37.8	D	37.3	D	37.6	D
		PM	31.7	C	30.9	C	30.9	C	31.2	C	31.9	C
10	Hacienda Drive & Martinelli Boulevard/Hacienda Crossings <sup>a</sup>	AM	20.2	C	19.5	B	19.7	B	20.2	C	19.9	B
		PM	28.8	C	26.9	C	27.7	C	28.7	C	28.7	C
11	Hacienda Drive & I-580 WB Ramps <sup>a</sup>	AM	7.7	A	7.5	A	7.5	A	7.9	A	7.6	A
		PM	8.9	A	8.7	A	7.5	A	8.9	A	8.8	A
12	Hacienda Drive & I-580 EB Ramps	AM	18.9	B	18.8	B	18.6	B	19.3	B	19.0	B
		PM	20.7	C	21.9	C	20.6	C	20.7	C	20.8	C
13	Hacienda Drive & Owens Road	AM	23.4	C	23.5	C	23.3	C	23.3	C	23.4	C
		PM	30.5	C	32.2	C	29.8	C	30.4	C	30.5	C
14	Tassajara Road & Dublin Boulevard <sup>a</sup>	AM	50.5	D	40.7	D	47.2	D	50.2	D	50.4	D
		PM	46.2	D	38.5	D	40.4	D	45.7	D	46.2	D
15	Tassajara Road & I-580 WB Ramps <sup>a</sup>	AM	11.5	B	11.6	B	11.4	B	11.5	B	11.5	B
		PM	11.8	B	11.4	B	11.7	B	11.7	B	11.7	B

**TABLE 3.B-49 INTERSECTION DELAY AND LEVEL OF SERVICE, 2040 PROJECT CONDITIONS**

#	Intersection	Time	DMU									
			No Project Alternative		Conventional BART Project		Alternative (with EMU Option)		Express Bus/BRT Alternative		Enhanced Bus Alternative	
			Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
16	Santa Rita Road & I-580 EB Ramps/Pimlico Drive	AM	19.5	B	19.4	B	19.3	B	19.3	B	19.4	B
		PM	32.8	C	34.2	C	32.6	C	32.7	C	32.7	C
17	Santa Rita Road & Valley Avenue	AM	24.0	C	27.2	C	24.1	C	24.0	C	26.2	C
		PM	77.5	E	76.2	E	77.0	E	77.1	E	78.3	E
18	Bernal Avenue/Valley Avenue & Stanley Boulevard	AM	38.5	D	38.5	D	38.4	D	38.3	D	38.5	D
		PM	32.6	C	32.8	C	32.6	C	32.6	C	32.6	C
19	Fallon Road & Dublin Boulevard <sup>a</sup>	AM	35.1	D	28.1	C	42.4	D	34.6	C	35.1	D
		PM	30.1	C	28.2	C	28.0	C	23.5	C	23.6	C
20	El Charro Road/Fallon Road & I-580 WB Ramps <sup>a</sup>	AM	10.8	B	11.3	B	11.0	B	11.0	B	8.4	A
		PM	9.5	A	9.7	A	9.7	A	11.2	B	11.1	B
21	El Charro Road & I-580 EB Ramps	AM	11.3	B	11.3	B	11.2	B	11.2	B	11.1	B
		PM	12.0	B	12.8	B	12.1	B	11.6	B	12.3	B
22	El Charro Road & Stoneridge Drive/Jack London Boulevard	AM	26.5	C	22.6	C	26.1	C	24.1	C	24.1	C
		PM	28.6	C	30.1	C	29.9	C	27.1	C	28.0	C
23	Stanley Boulevard & El Charro Road	AM	38.9	D	35.8	D	34.9	C	38.3	D	39.2	D
		PM	31.6	C	22.3	C	23.1	C	30.3	C	29.0	C
24	Airway Boulevard/Driveway & North Canyons Parkway	AM	98.8	F	53.9	D	74.6	E	93.2	F	97.7	F
		PM	35.7	D	24.1	C	24.5	C	34.7	C	36.5	D
25	Airway Boulevard & I-580 WB Ramps	AM	16.4	B	13.2	B	22.1	C	13.7	B	13.8	B
		PM	5.5	A	6.9	A	6.5	A	5.5	A	5.5	A
26	Airway Boulevard & I-580 EB Ramps/Kitty Hawk Road	AM	30.8	C	21.6	C	27.8	C	22.4	C	22.4	C
		PM	39.4	D	26.5	C	28.5	C	38.3	D	38.5	D
27	Collier Canyon Road & North Canyons Parkway/Portola Avenue	AM	24.0	C	23.0	C	22.8	C	23.3	C	23.9	C
		PM	22.3	C	20.6	C	21.0	C	22.4	C	22.6	C
28	Isabel Avenue/Campus Hill Drive & Portola Avenue	AM	27.7	C	27.1	C	27.0	C	27.5	C	27.5	C
		PM	27.5	C	30.2	C	25.9	C	27.3	C	28.0	C

TABLE 3.B-49 INTERSECTION DELAY AND LEVEL OF SERVICE, 2040 PROJECT CONDITIONS

#	Intersection	Time	DMU									
			No Project Alternative		Conventional BART Project		Alternative (with EMU Option)		Express Bus/BRT Alternative		Enhanced Bus Alternative	
			Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
29	Isabel Avenue & I-580 WB Ramps	AM	11.5	B	15.0	B	12.4	B	13.0	B	12.8	B
		PM	14.4	B	14.0	B	14.1	B	13.7	B	13.4	B
30	Isabel Avenue & I-580 EB Ramps	AM	6.1	A	6.0	A	5.1	A	6.6	A	7.0	A
		PM	6.4	A	12.0	B	6.5	A	5.7	A	6.0	A
31	Isabel Avenue & Airway Boulevard	AM	34.3	C	58.5	E	45.2	D	34.2	C	34.1	C
		PM	36.4	D	98.1	F	64.7	E	38.7	D	39.2	D
32	Isabel Avenue & Jack London Boulevard	AM	50.6	D	46.2	D	49.1	D	50.9	D	50.7	D
		PM	79.8	E	65.7	E	75.4	E	80.6	F	48.6	D
33	Isabel Avenue Connector & Stanley Boulevard	AM	40.5	D	34.0	C	30.1	C	39.2	D	39.2	D
		PM	73.8	E	64.6	E	67.7	E	73.8	E	71.1	E
34	Murrieta Boulevard/Driveway & Portola Avenue	AM	14.5	B	16.0	B	15.9	B	14.6	B	14.6	B
		PM	33.7	C	29.0	C	32.3	C	40.3	D	33.4	C
35	Murrieta Boulevard & Jack London Boulevard	AM	25.0	C	30.6	C	31.7	C	24.6	C	24.5	C
		PM	100.7	F	110.9	F	99.2	F	63.5	E	72.4	E
36	Murrieta Boulevard & Stanley Boulevard	AM	98.3	F	100.6	F	96.8	F	97.0	F	99.0	F
		PM	45.8	D	55.3	E	54.0	D	47.1	D	48.6	D
37	Livermore Avenue & I-580 WB Ramps	AM	23.5	C	22.9	C	34.9	C	23.9	C	22.5	C
		PM	27.8	C	27.3	C	29.5	C	26.1	C	26.1	C
38	Livermore Avenue & I-580 EB Ramps	AM	17.5	B	15.8	B	18.1	B	18.0	B	15.0	B
		PM	74.3	E	69.1	E	70.0	E	78.1	E	74.6	E
39	Livermore Avenue & Portola Avenue	AM	43.8	D	43.5	D	43.4	D	41.3	D	40.9	D
		PM	52.6	D	58.7	E	53.3	D	53.6	D	50.1	D
40	First Street/Springtown Boulevard & I-580 WB Ramps	AM	16.3	B	8.0	A	16.5	B	10.3	B	10.3	B
		PM	14.1	B	16.1	B	16.1	B	13.0	B	12.9	B
41	First Street & I-580 EB Ramps	AM	14.5	B	11.2	B	14.2	B	11.8	B	12.0	B
		PM	47.1	D	46.0	D	45.8	D	46.5	D	47.0	D
42	First Street & Mines Road	AM	26.2	C	26.3	C	26.0	C	26.3	C	25.8	C
		PM	52.1	D	71.1	E	62.8	E	50.8	D	48.6	D
43	Vasco Road / I-580 WB Ramps	AM	0.7	A	0.6	A	0.7	A	0.7	A	0.7	A
		PM	1.7	A	1.8	A	1.6	A	1.5	A	1.6	A
44	Vasco Road / I-580 EB Ramps	AM	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		PM	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

TABLE 3.B-49 INTERSECTION DELAY AND LEVEL OF SERVICE, 2040 PROJECT CONDITIONS

#	Intersection	Time	DMU									
			No Project Alternative		Conventional BART Project		Alternative (with EMU Option)		Express Bus/BRT Alternative		Enhanced Bus Alternative	
			Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
45	Vasco Road & East Avenue	AM	20.9	C	24.0	C	21.2	C	21.2	C	24.2	C
		PM	87.4	F	<b>92.5</b>	<b>F</b>	86.1	F	85.7	F	84.9	F
46	Greenville Road & I-580 WB Ramps	AM	8.8	A	7.6	A	8.7	A	7.6	A	7.4	A
		PM	5.3	A	5.6	A	5.5	A	5.4	A	5.4	A
47	Greenville Road & I-580 EB Ramps	AM	4.2	A	4.5	A	4.2	A	4.5	A	4.6	A
		PM	9.2	A	10.0	B	9.9	A	9.5	A	9.4	A
48	Greenville Road /Altamont Pass Road	AM	7.1	A	8.3	A	7.6	A	7.1	A	7.1	A
		PM	96.1	F	<b>120.0</b>	<b>F</b>	<b>112.1</b>	<b>F</b>	97.2	F	94.2	F
49	Greenville Road & Southfront Road	AM	14.3	B	8.7	A	14.1	B	8.8	A	8.8	A
		PM	13.9	B	14.0	B	13.9	B	14.5	B	16.9	B
50	Greenville Road / Patterson Pass Road	AM	40.6	D	42.0	D	42.8	D	39.8	D	39.4	D
		PM	156.3	F	<b>186.7</b>	<b>F</b>	156.6	F	159.7	F	157.4	F

Notes: EB = eastbound; WB = westbound; LOS = level of service.

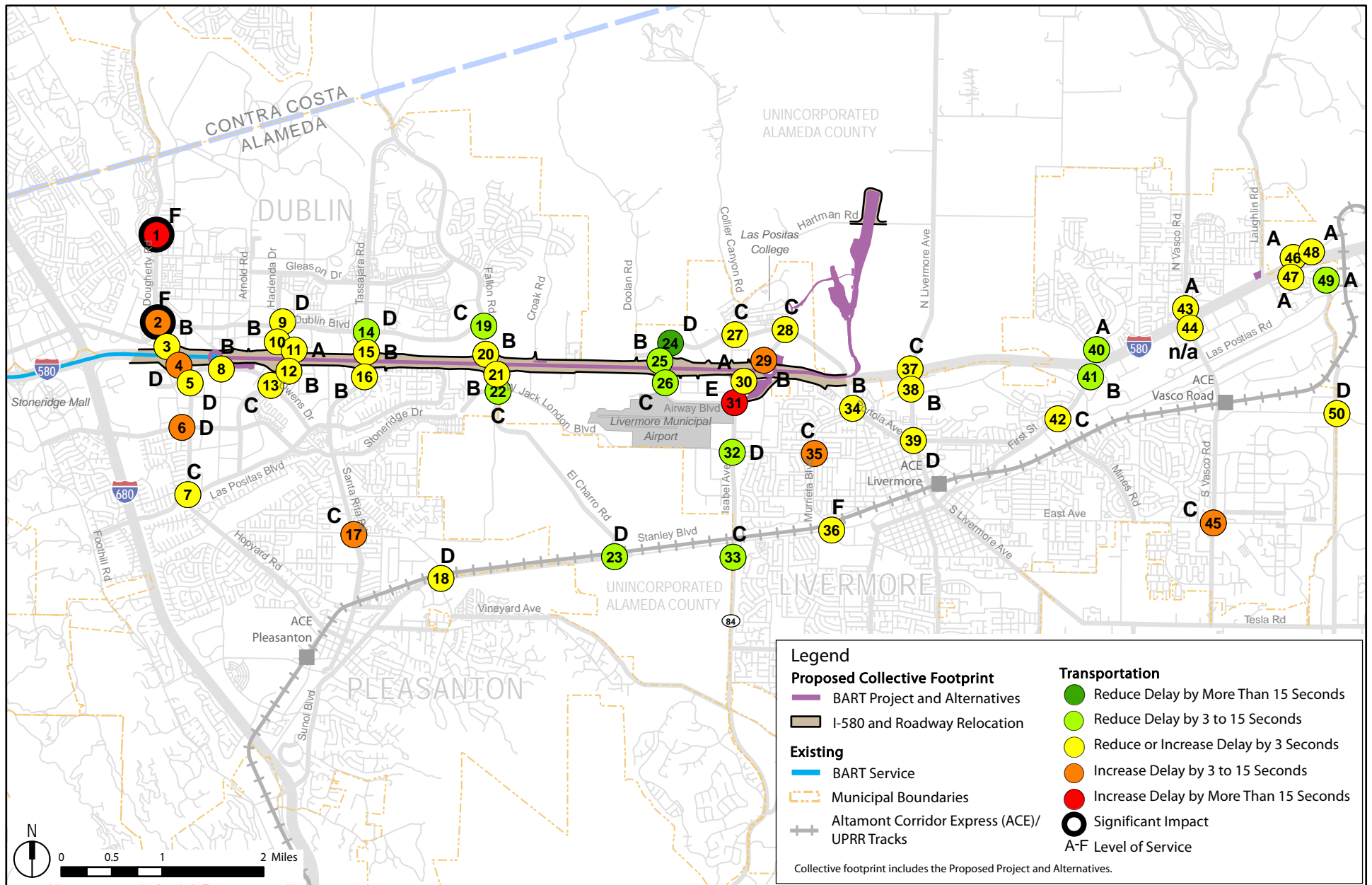
**Bold/gray shading** indicates intersections having a significant impact; *italic/gray shading* indicates policy-exempt intersections having a less-than-significant impact.

<sup>a</sup>The significant impact criteria of the Cities of Dublin and Pleasanton use added vehicle trips as a metric rather than increased delay.

Source: Cambridge Systematics, 2017.

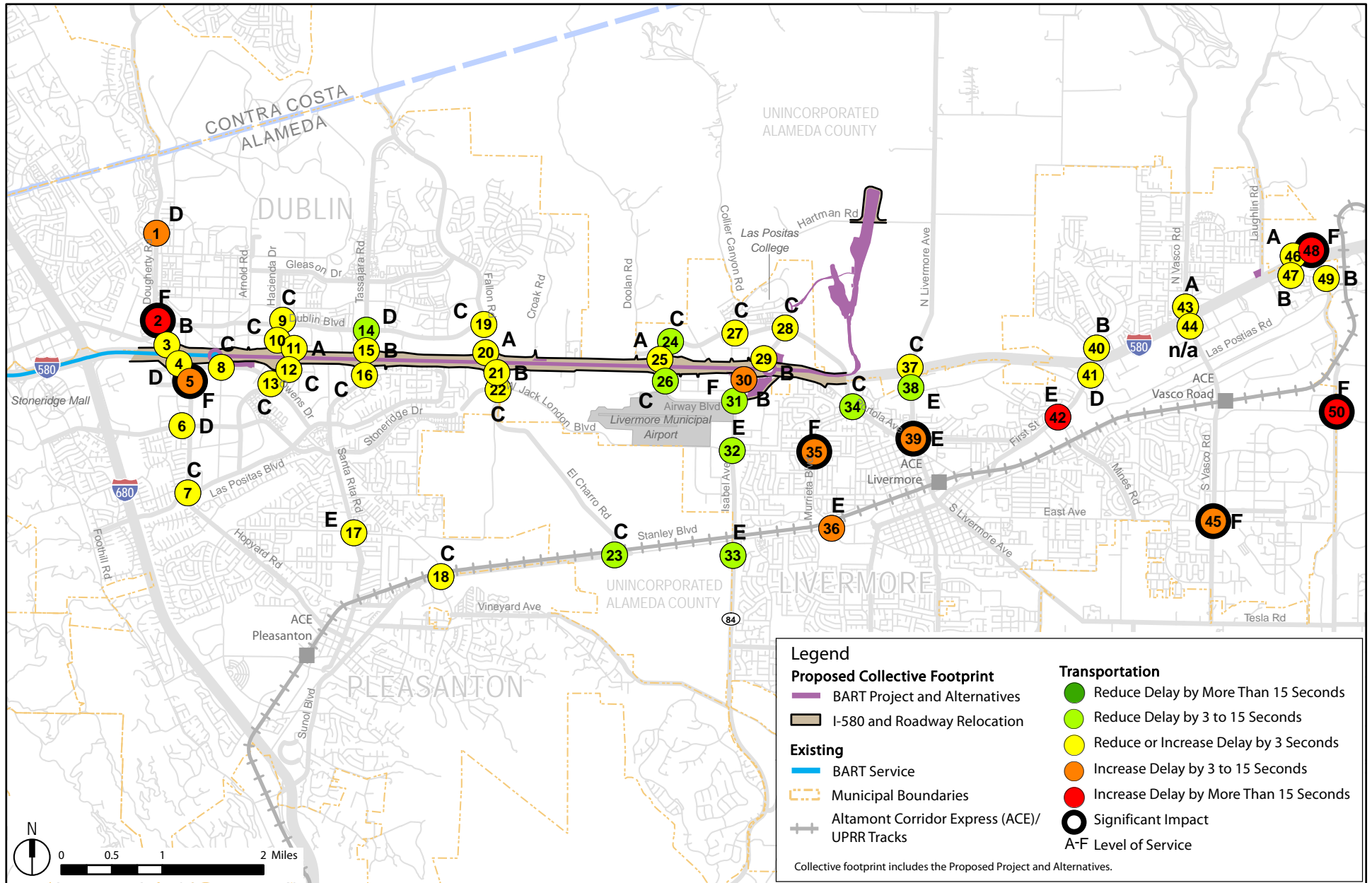
Figures 3.B-18 through 3.B-25 present the results of the intersection LOS analysis for 2040.

**No Project Alternative.** Under the No Project Alternative, the BART to Livermore Extension Project would not be implemented and there would be no physical changes in the environment associated with the Proposed Project or any of the Build Alternatives. However, planned and programmed transportation improvements for segments of I-580, local roadways and intersections, and core transit service improvements for BART, ACE, and LAVTA would be constructed. In addition, population and employment increases throughout Alameda County would result in continued land use development, including both residential and commercial. These improvements and development projects could result in potential impacts to intersections. However, the effects of the other projects associated with the No Project Alternative scenario have been or will be addressed in environmental documents prepared for those projects before they are implemented, and



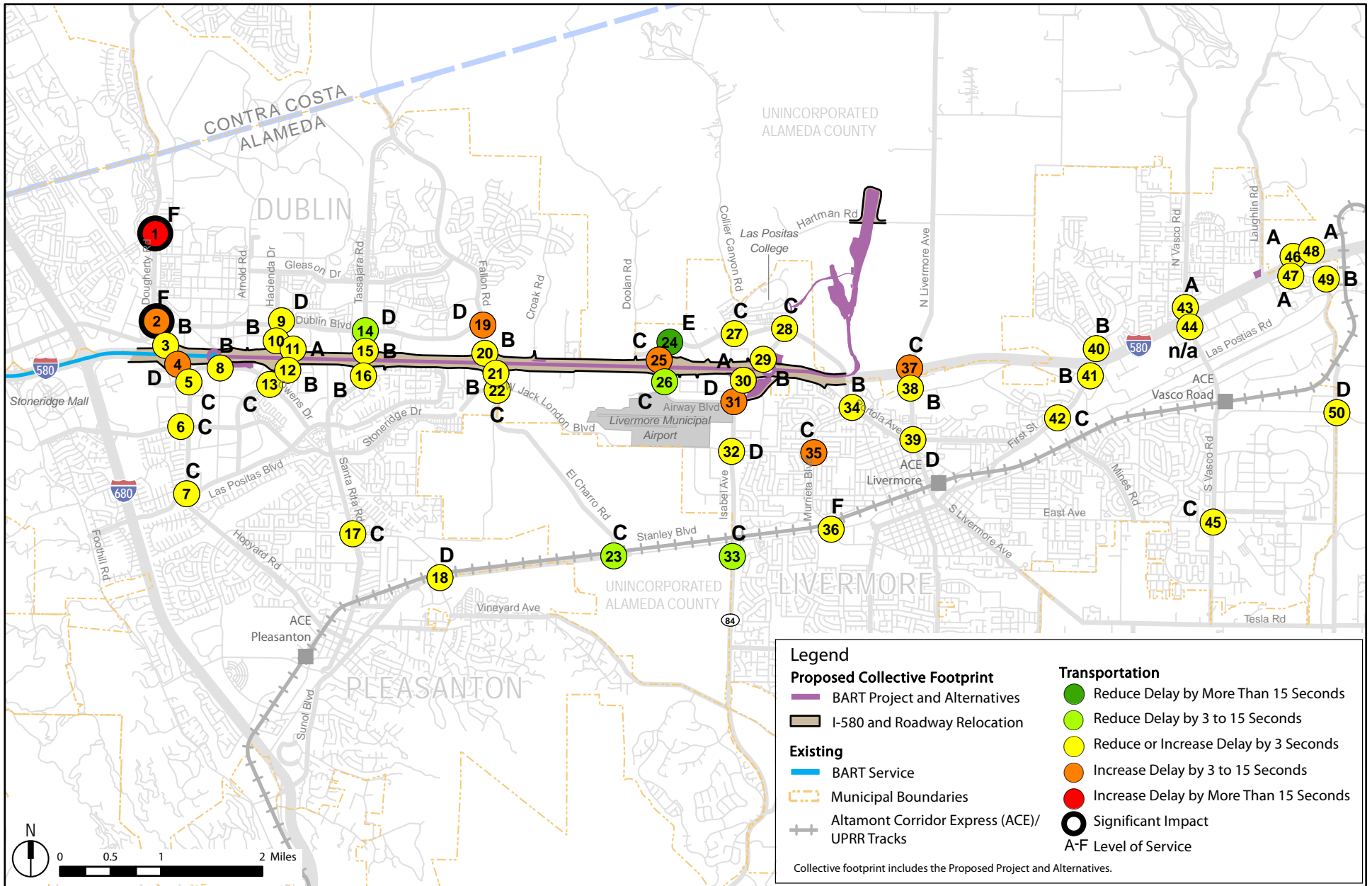
Source: Arup, 2017.

Figure 3.B- 18  
 Transportation  
 Intersection LOS and Change in AM Delay  
 2040 Conventional BART Project



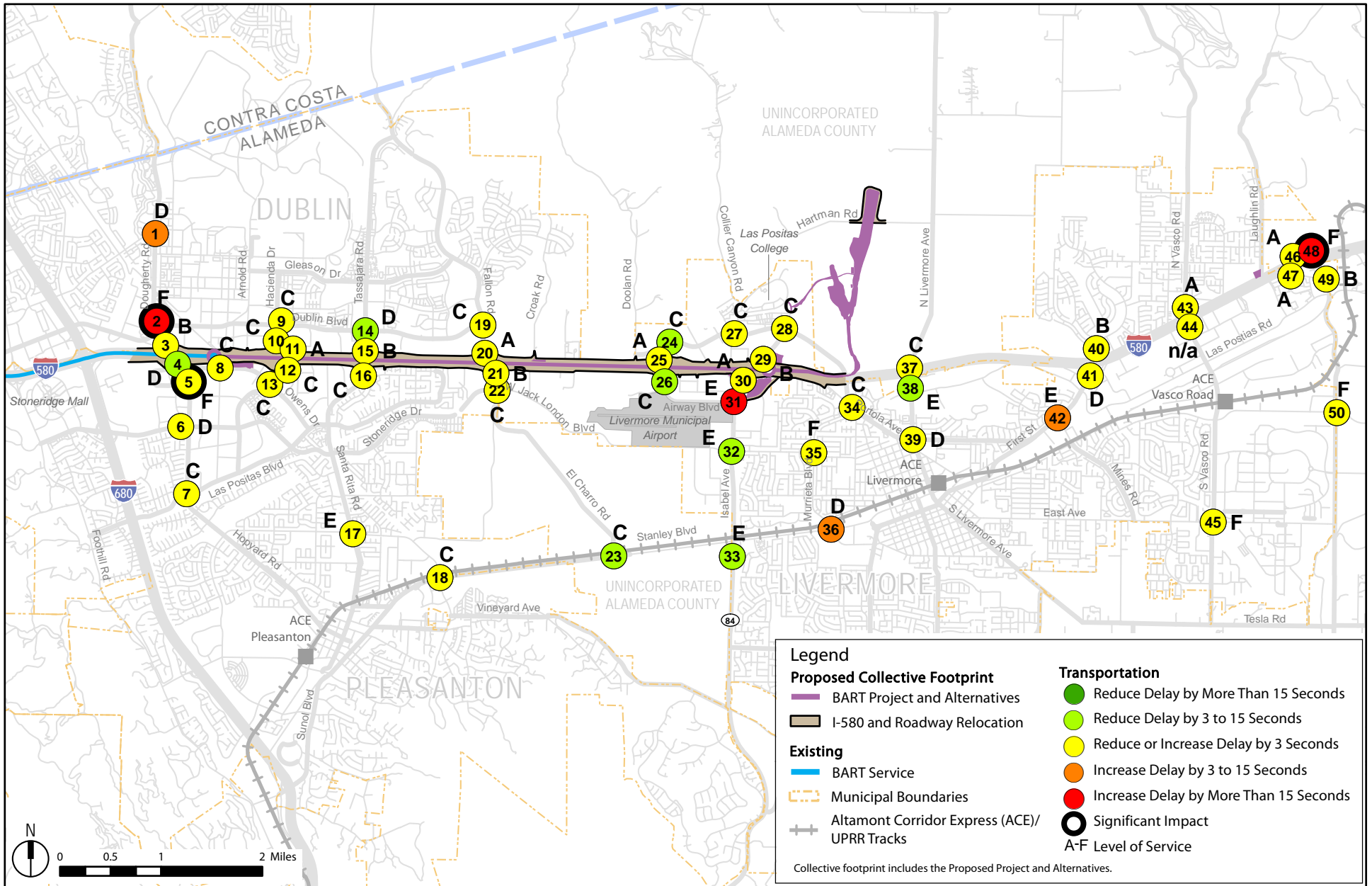
Source: Arup, 2017.

Figure 3.B- 19  
 Transportation  
 Intersection LOS and Change in PM Delay  
 2040 Conventional BART Project



Source: Arup, 2017.

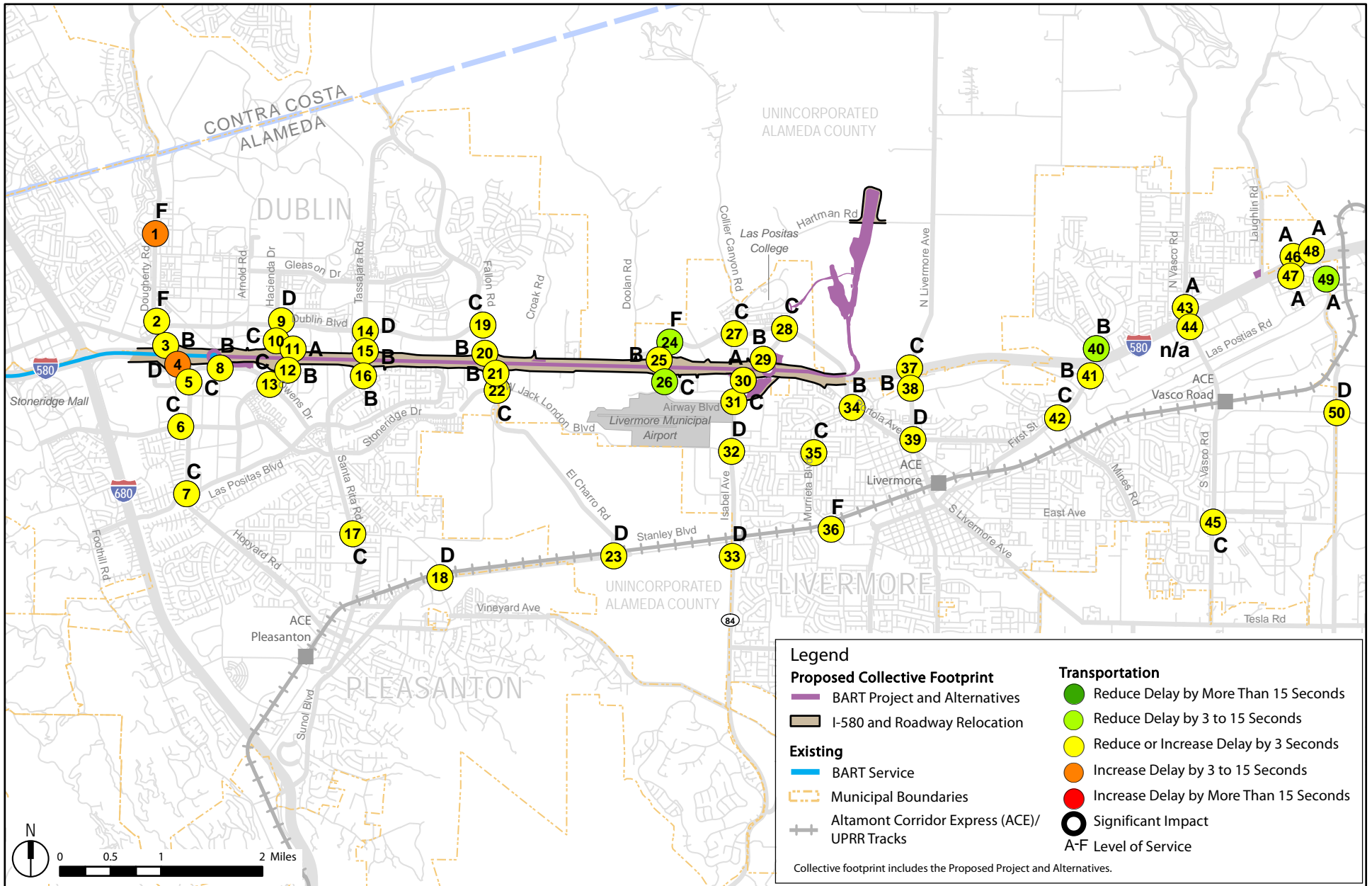
Figure 3.B-20  
 Transportation  
 Intersection LOS and Change in AM Delay  
 2040 DMU Alternative



Source: Arup, 2017.

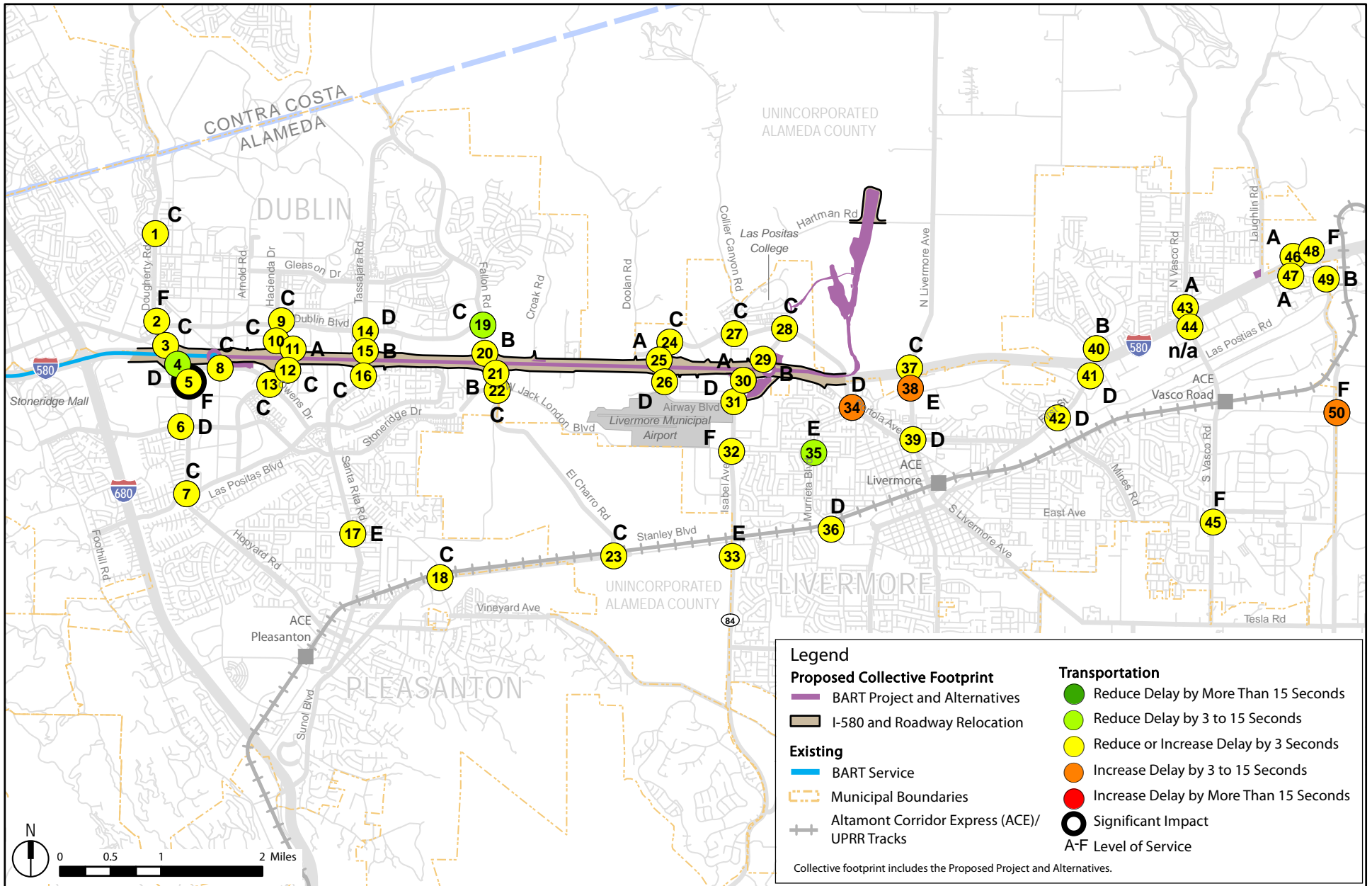
Figure 3.B-21  
 Transportation  
 Intersection LOS and Change in PM Delay  
 2040 DMU Alternative





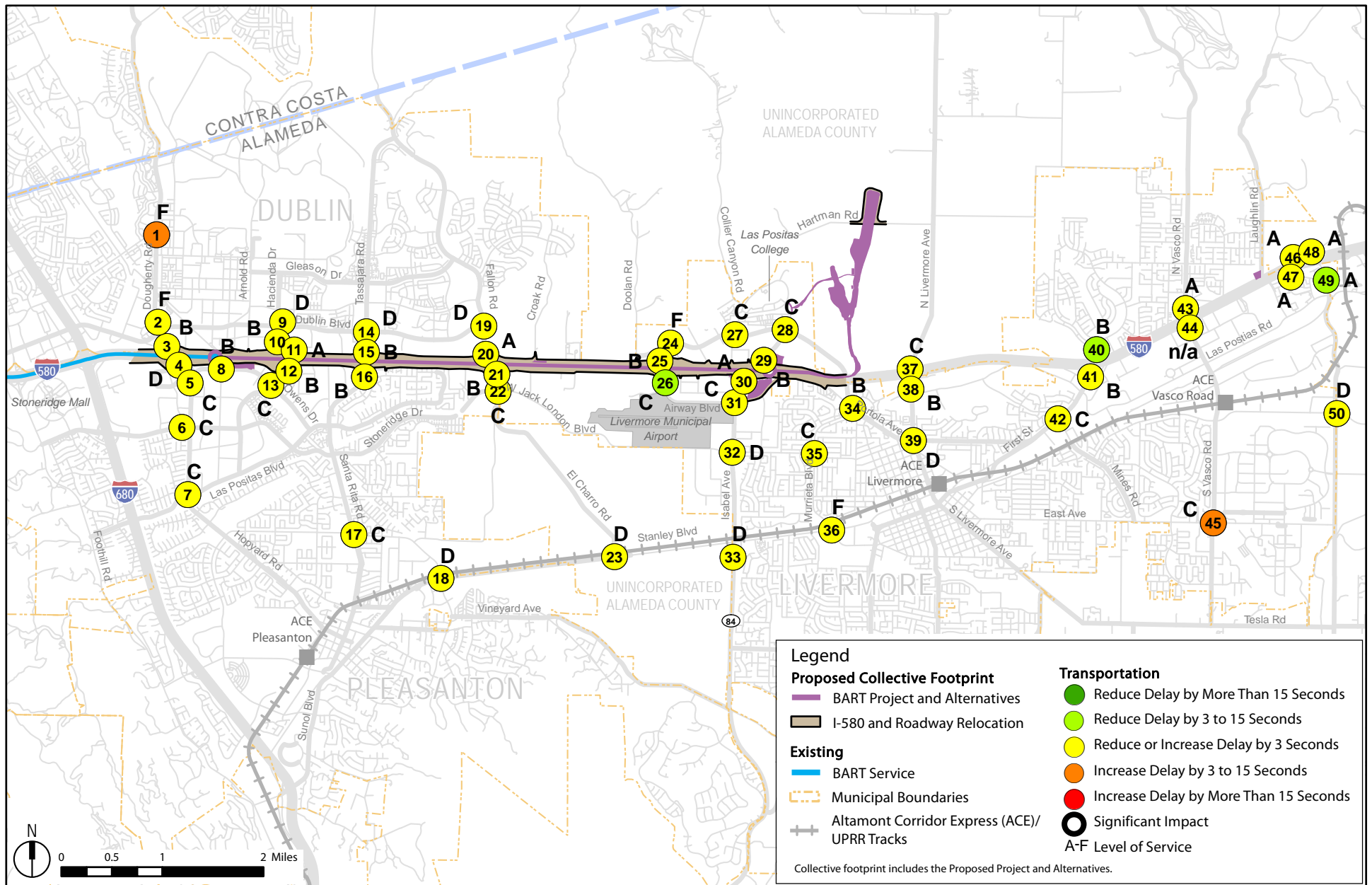
Source: Arup, 2017.

Figure 3.B-22  
 Transportation  
 Intersection LOS and Change in AM Delay  
 2040 Express Bus/BRT Alternative



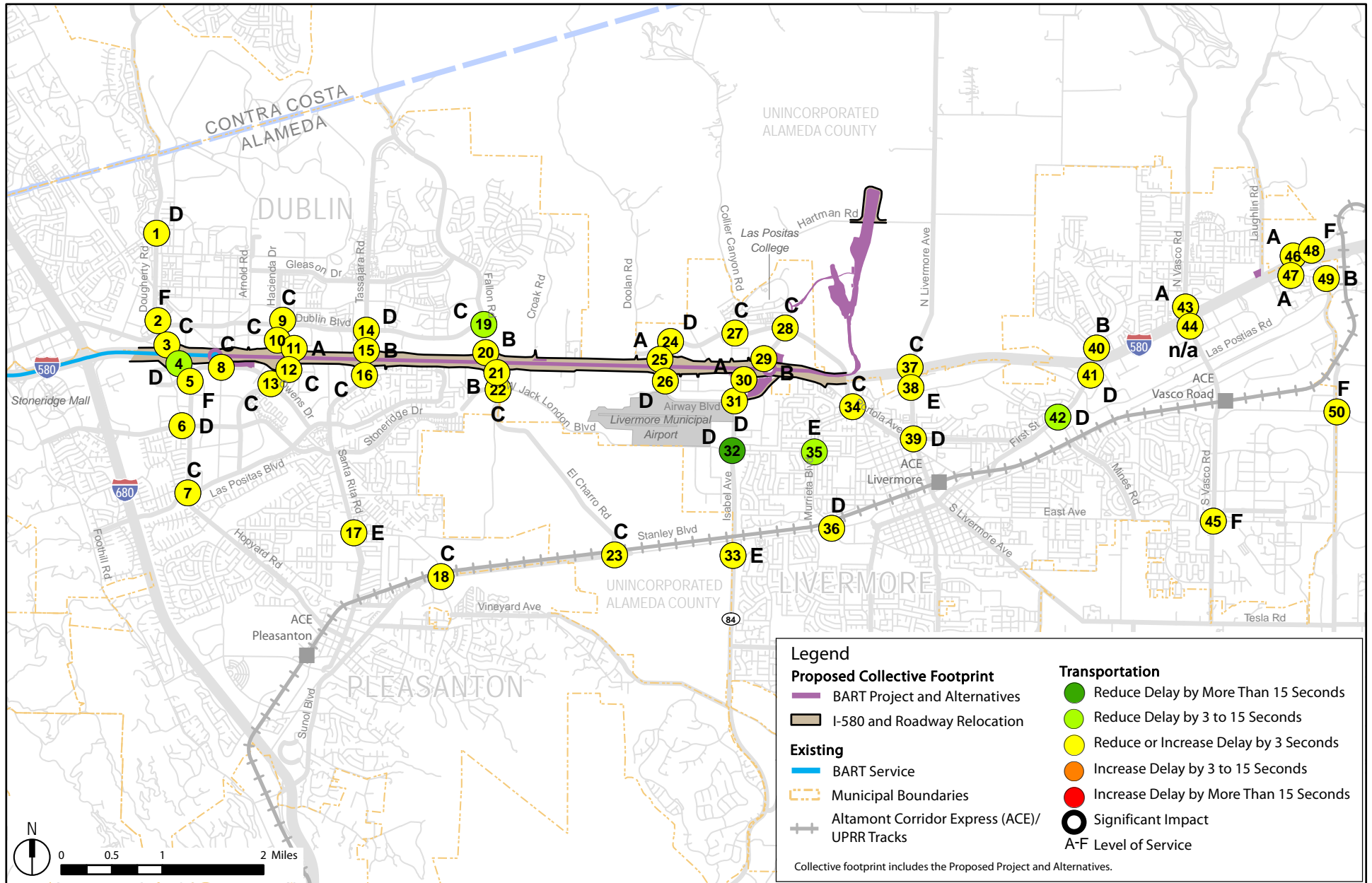
Source: Arup, 2017.

Figure 3.B-23  
 Transportation  
 Intersection LOS and Change in PM Delay  
 2040 Express Bus/BRT Alternative



Source: Arup, 2017.

Figure 3.B-24  
 Transportation  
 Intersection LOS and Change in AM Delay  
 2040 Enhanced Bus Alternative



Source: Arup, 2017.

Figure 3.B-25  
 Transportation  
 Intersection LOS and Change in PM Delay  
 2040 Enhanced Bus Alternative

the No Project Alternative would not result in new impacts as a consequence of the BART Board of Directors' decision not to adopt a project. Therefore, the No Project Alternative is considered to have no impact to intersections. **(NI)**

**Conventional BART Project.** Under the Proposed Project in 2040, 11 intersections would experience significant or less-than-significant impacts. Three of these intersections are exempt by policy from applicable LOS standards, and are therefore considered to experience less-than-significant impacts. One of the eight remaining other intersections that experience impacts above the significance threshold may also be exempt, but is treated here as non-exempt until the exemption is confirmed by the relevant jurisdiction.

The policy-exempt intersections are as follows:

- **Isabel Avenue & Airway Boulevard (Intersection #31).** Under 2040 Project Conditions, this intersection would operate at an LOS F with a delay of 58.5 seconds in the AM peak period and an LOS F with a delay of 98.1 seconds in the PM peak period. However, this intersection is designated as exempt from the City of Livermore's LOS standard because this intersection is near a freeway interchange.
- **Murrieta Boulevard & Stanley Boulevard (Intersection #36).** Under 2040 Project Conditions, this intersection would operate at an LOS F with a delay of 55.3 seconds in the PM peak period. However, this intersection is designated as exempt from the City of Livermore's LOS standard because of environmental constraints, ROW constraints or cut-through traffic volumes or other City of Livermore policies that prevent the implementation of improvements that would achieve the City's LOS standards.
- **First Street & Mines Road (Intersection #42).** Under 2040 Project Conditions, this intersection would operate at an LOS E with a delay of 71.1 seconds in the PM peak period. However, this intersection is designated as exempt from the City of Livermore's LOS standard because of environmental constraints, ROW constraints or cut-through traffic volumes or other City of Livermore policies that prevent the implementation of improvements that would achieve the City's LOS standards.

Significant impacts would occur at the following eight intersections:

- **Dougherty Road & Amador Valley Road (Intersection #1).** Under 2040 Project Conditions, this intersection would operate at an LOS F with a delay of 150.1 seconds in the AM peak period. This intersection also has 391 additional trips under the Project Conditions compared to No Project Conditions in the PM peak period, which is greater than the City of Dublin's threshold of 50 additional trips.
- **Hopyard Road/Dougherty Road & Dublin Boulevard (Intersection #2).** Under 2040 Project Conditions, this intersection would operate at an LOS F with a delay of 106.4 seconds in the AM peak and an LOS F with a delay of 173.8 seconds in the PM peak period. This intersection also has 187 additional trips in the AM peak period and 296

additional trips in the PM peak period under Project Conditions compared to No Project Conditions, which is greater than the City of Dublin's threshold of 50 additional trips.

- **Hopyard Road & Owens Road (Intersection #5).** Under 2040 Project Conditions, this intersection would operate at an LOS F with a delay of 107.6 seconds in the PM peak. This intersection has 253 additional trips in the AM peak period and 220 additional trips in the PM peak period under Project Conditions compared to No Project Conditions, which is greater than the City of Pleasanton's threshold of 10 additional trips. However, this intersection is designated a Gateway Intersection and may be exempt from the City of Pleasanton's LOS standard if vehicular capacity improvements would be contrary to other City goals.
- **Murrieta Boulevard & Jack London Boulevard (Intersection #35).** Under 2040 Project Conditions, this intersection would operate at an LOS F with a delay of 110.9 seconds in the PM peak period, which is greater than 45 seconds, the significance threshold identified for this intersection.
- **Livermore Avenue & Portola Avenue (Intersection #39).** Under 2040 Project Conditions, this intersection would operate at an LOS E with a delay of 58.7 seconds in the PM peak period, which is greater than 45 seconds, the significance threshold identified for this intersection.
- **Vasco Road & East Avenue (Intersection #45).** Under 2040 Project Conditions, this intersection would operate at an LOS F with a delay of 92.5 seconds in the PM peak period, which is greater than 45 seconds, the significance threshold identified for this intersection.
- **Greenville Road & Altamont Pass Road (Intersection #48).** Under 2040 Project Conditions, this intersection would operate at an LOS F with a delay of 120.0 seconds in the PM peak period, which is greater than 45 seconds, the significance threshold identified for this intersection.
- **Greenville Road/Patterson Pass Road (Intersection #50).** Under 2040 Project Conditions, this intersection would operate at an LOS F with a delay of 186.7 seconds in the PM peak period, which is greater than 45 seconds, the significance threshold identified for this intersection.

With the exception of Intersection #5 and Intersection #39, significant impacts would be reduced to less than significant with implementation of **Mitigation Measure TRAN-8a**, which requires intersection improvements such as additional turning and through lanes. **Mitigation Measure TRAN-8a** would include the addition of a full eight-phase signal operation at Intersection #5 and second northbound left-turn lane at Intersection #39. However, these mitigations would not reduce the significant impacts at Intersection #5 and Intersection #39 to less than significant, and further improvements at these

intersections would be infeasible due to physical constraints. Impacts at Intersection #5 and Intersection #39 would be significant and unavoidable. (SU)

**DMU Alternative.** Under the DMU Alternative in 2040, three intersections are exempt by policy from applicable LOS standards, and are therefore considered to experience less-than-significant impacts, while four intersections would experience significant impacts. One of the four intersections listed to experience significant impacts may be exempt by policy from applicable LOS standards, but is treated here as non-exempt until the exemption is confirmed by the relevant jurisdiction.

The policy-exempt intersections are as follows:

- **Isabel Avenue & Airway Boulevard (Intersection #31).** Under 2040 Project Conditions, this intersection would operate at an LOS E with a delay of 64.7 seconds in the PM peak period. However, this intersection is designated as exempt from the City of Livermore's LOS standard because this intersection is near a freeway interchange.
- **Murrieta Boulevard & Stanley Boulevard (Intersection #36).** Under 2040 Project Conditions, this intersection would operate at an LOS D with a delay of 54.0 seconds in the PM peak period. However, this intersection is designated as exempt from the City of Livermore's LOS standard because of environmental constraints, ROW constraints or cut-through traffic volumes or other City of Livermore policies that prevent the implementation of improvements that would achieve the City's LOS standards.
- **First Street & Mines Road (Intersection #42).** Under 2040 Project Conditions, this intersection would operate at an LOS E with a delay of 62.8 seconds in the PM peak period. However, this intersection is designated as exempt from the City of Livermore's LOS standard because of environmental constraints, ROW constraints or cut-through traffic volumes or other City of Livermore policies that prevent the implementation of improvements that would achieve the City's LOS standards.

Significant impacts would occur at the following four intersections:

- **Dougherty Road & Amador Valley Road (Intersection #1).** Under 2040 Project Conditions, this intersection would operate at an LOS F with a delay of 134.0 seconds in the AM peak period. This intersection also has 279 additional trips under the DMU Alternative compared to No Project Conditions in the PM peak period, which is greater than the City of Dublin's threshold of 50 additional trips.
- **Hopyard Road/Dougherty Road & Dublin Boulevard (Intersection #2).** Under 2040 Project Conditions, this intersection would operate at an LOS F with a delay of 106.7 seconds in the AM peak and an LOS F with a delay of 164.8 seconds in the PM peak period. This intersection also has 189 additional trips under the DMU Alternative

compared to in the PM peak period, which is greater than the City of Dublin's threshold of 50 additional trips.

- **Hopyard Road & Owens Road (Intersection #5).** Under 2040 Project Conditions, this intersection would operate at an LOS F with a delay of 98.7 seconds in the PM peak. This intersection also has 133 additional trips in the PM peak period under Project Conditions compared to No Project Conditions, which is greater than the City of Pleasanton's threshold of 10 additional trips. However, this intersection is designated a Gateway Intersection and may be exempt from the City of Pleasanton's LOS standard if vehicular capacity improvements would be contrary to other City of Pleasanton goals. If its exempt status is confirmed after consultation with the City, there would be no impact and no mitigation would be required.
- **Greenville Road & Altamont Pass Road (Intersection #48).** Under 2040 Project Conditions, this intersection would operate at an LOS E with a delay of 112.1 seconds in the PM peak period, which is greater than 45 seconds, the significance threshold identified for this intersection.

With the exception of Intersection #5, significant impacts would be reduced to less than significant with implementation of **Mitigation Measure TRAN-8b**, which requires intersection improvements such as additional turning and through lanes. **Mitigation Measure TRAN-8b** would include the addition of a full eight-phase signal operation at Intersection #5. However, this mitigation would not reduce the significant impacts at Intersection #5 to less than significant, and further improvements at this intersection would be infeasible due to physical constraints. Impacts at Intersection #5 would be significant and unavoidable. (SU)

**Express Bus/BRT Alternative.** Under the Express Bus/BRT Alternative in 2040, one intersection would experience significant or less-than-significant impacts. This intersection may be exempt, but is treated here as non-exempt until the exemption is confirmed by the relevant jurisdiction.

Significant impacts would occur at the following intersection:

- **Hopyard Road & Owens Road (Intersection #5).** Under 2040 Project Conditions, this intersection would operate at an LOS F with a delay of 101.6 seconds in the PM peak. This intersection also has 10 additional trips under the Express Bus Alternative compared to No Project Conditions in the PM peak period, which is equal to the City of Pleasanton's threshold of 10 additional trips. However, this intersection is designated a Gateway Intersection and may be exempt from the City of Pleasanton's LOS standard if vehicular capacity improvements would be contrary to other City goals.

**Mitigation Measure TRAN-8c** would include the addition of a full eight-phase signal operation at Intersection #5. However, this mitigation would not reduce the significant



impacts at Intersection #5 to less than significant, and further improvements at this intersection would be infeasible due to physical constraints. Impacts at Intersection #5 would be significant and unavoidable. **(SU)**

**Enhanced Bus Alternative.** Under the Enhanced Bus Alternative in 2040, no operations would degrade below the threshold of significance. Therefore, the Enhanced Bus Alternative would have no impacts related to intersections in 2040, and no mitigation measures are required. **(NI)**.

**Mitigation Measures.** As described above, the Proposed Project, DMU Alternative, and the Express Bus/BRT Alternative would have potentially significant impacts to intersections in 2040. Impacts associated with the Proposed Project at most intersections would be reduced to less than significant with implementation of **Mitigation Measure TRAN-8a**. However, impacts at Intersection #5 and Intersection #39 would be significant and unavoidable. Additional mitigation at this intersection is infeasible due to physical constraints that prevent the addition of new turning lanes or through lanes.

With implementation of **Mitigation Measure TRAN-8b**, impacts associated with the DMU Alternative at most intersections would be reduced to less than significant. However, impacts at Intersection #5 would be significant and unavoidable. Additional mitigation at this intersection is infeasible due to physical constraints that prevent the addition of new turning lanes or through lanes.

Under the Express Bus/BRT Alternative the implementation of **Mitigation Measure TRAN-8c** would not lower impacts at Intersection #5 to less than significant and impacts at this intersection would be significant and unavoidable. Additional mitigation at this intersection is infeasible due to physical constraints that prevent the addition of new turning lanes or through lanes.

As described above, the Enhanced Bus Alternative would not result in significant impacts and no mitigation measures are required for this alternative.

**Mitigation Measure TRAN-8a: Improvements for Intersections #1, #2, #5, #35, #39, #45, #48, and #50 under 2040 Project Conditions (Conventional BART Project).**

BART shall coordinate with local jurisdictions to implement and contribute its fair share toward funding the following improvements at the following intersections:

- Dougherty Road & Amador Valley Road (Intersection #1) – Add an eastbound right-turn overlap phase.
- Dougherty Road & Dublin Boulevard (Intersection #2) – Add a third southbound left-turn lane and a second westbound right-turn lane.

- Hopyard Road & Owens Road (Intersection #5) – Create a full eight-phase signal operation. Alternatively, if this intersection is confirmed to be exempt from the City of Pleasanton’s LOS standard following consultation with the City, no mitigation is required.
- Murrieta Boulevard & Jack London Boulevard (Intersection #35) – Add an eastbound right-turn overlap phase.
- Livermore Avenue & Portola Avenue (Intersection #39) – Add a second northbound left-turn lane.
- Vasco Road & East Avenue (Intersection #45) – Operate eastbound and westbound phases as split phases. Reconfigure eastbound lanes to include one left-turn lane, one shared left-turn/through lane, and one shared through/right-turn lane.
- Greenville Road & WB I-580 Ramps (Intersection #48) – Add a second eastbound through lane.
- Greenville Road & Patterson Pass Road (Intersection #50) – Add a second eastbound through lane and a dedicated eastbound right-turn lane.

**Mitigation Measure TRAN-8b: Improvements for Intersections #1, #2, #5, and #48 under 2040 Project Conditions (DMU Alternative/EMU Option)**

BART shall coordinate with local jurisdictions to implement and contribute its fair share toward funding the following improvements at the following intersections:

- Dougherty Road & Amador Valley Road (Intersection #1) – Add an eastbound right-turn overlap phase.
- Dougherty Road & Dublin Boulevard (Intersection #2) – Add a third southbound left-turn lane and a second westbound right-turn lane.
- Hopyard Road & Owens Road (Intersection #5) – Create a full eight-phase signal operation. Alternatively, if this intersection is confirmed to be exempt from the City of Pleasanton’s LOS standard following consultation with the City, no mitigation is required.
- Greenville Road & WB I-580 Ramps (Intersection #48) – Add a second eastbound through lane.

**Mitigation Measure TRAN-8c: Improvements for Intersection #5 under 2040 Project Conditions (Express Bus/BRT Alternative)**

BART shall coordinate with local jurisdictions to implement and contribute its fair share toward funding the following improvements at the following intersection:

- Hopyard Road & Owens Road (Intersection #5) – Create a full eight-phase signal operation. Alternatively, if this intersection is confirmed to be exempt from the

City of Pleasanton's LOS standard following consultation with the City, no mitigation is required.

## Transit

***Impact TRAN-9: Impede the ability to improve transit access to BART, improve surrounding transit system inefficiencies, or improve ridership on surrounding transit services, under 2025 or 2040 Project Conditions.***

***(No Project Alternative: NI; Conventional BART Project: LS; DMU Alternative: LS; Express Bus/BRT Alternative: LS; Enhanced Bus Alternative: NI)***

The Proposed Project and Build Alternatives specifically aim to improve accessibility to the BART system by extending the rail service farther east and/or improving feeder bus service to and from BART. The Proposed Project and all Alternatives would provide similar or better access to BART than No Project Conditions. For the Proposed Project and the DMU Alternative, the proposed Isabel Station would feature a loop road adjacent to the station on the north side that would facilitate bus access. Connecting feeder bus service would be shifted to the Isabel Station from the Dublin/Pleasanton Station, and bus frequencies would match proposed rail frequencies. The Express Bus/BRT Alternative would provide exclusive bus lanes to the existing Dublin/Pleasanton Station, thereby enhancing bus access to BART. The Enhanced Bus Alternative would feature more bus service to the Dublin/Pleasanton Station than under No Project Conditions, as well as new bus infrastructure improvements on the key routes serving the station.

The Proposed Project and Build Alternatives specifically aim to improve surrounding transit service to the BART system by increasing the availability of frequent transit through the BART rail extension farther east and/or improving feeder bus service to and from BART. The Proposed Project and Build Alternatives would encourage higher-quality surrounding transit service and the reduction of system inefficiencies.

Bus operations plans under the Proposed Project and the DMU Alternative (with EMU Option) are identical and assume the elimination of redundant service and implementation of new bus routes and higher bus frequencies to connect key destinations in the project area to the new Isabel Station.

The Express Bus/BRT Alternative also proposes new bus routes to connect key destinations within the project area to the existing Dublin/Pleasanton Station, as well as higher bus service frequencies along these new and existing routes. In addition, the Express Bus/BRT Alternative would feature a direct bus to BART transfer at the Dublin/Pleasanton Station in the I-580 median for buses traveling on I-580. The bus operations plan under the Enhanced Bus Alternative is similar to the Express Bus/BRT Alternative, except that it does not feature a direct bus-to-rail freeway transfer station,

and it modifies bus service to the Lawrence Livermore National Laboratory employment area.

Table 3.B-50 below presents the daily ridership projections under 2025 Project Conditions for surrounding transit services; ACE ridership is expected to drop under the Proposed Project and DMU Alternative. Once BART is extended to Santa Clara County, some ACE riders traveling to southern Alameda County and Santa Clara County may prefer to ride BART but may be unable to find parking at the Dublin/Pleasanton Station. However, under the Proposed Project and DMU Alternative, these riders would switch from ACE to BART due to the available parking spaces at Isabel Station.

The ridership projections do not include a BART-ACE rail connection. ACE ridership could increase if any of the BART-ACE rail connection alternatives considered in the ACEforward Draft EIR analysis are implemented.

**TABLE 3.B-50 SURROUNDING TRANSIT SERVICES RIDERSHIP (WEEKDAY BOARDINGS), 2025 PROJECT CONDITIONS**

Systemwide Boardings (Change from No Project)					
	No Project	Conventional BART Project	DMU Alternative	Express Bus/BRT Alternative	Enhanced Bus Alternative
ACE	5,600	4,800 (-800)	4,900 (-700)	5,500 (-100)	5,600 (0)
LAVTA	10,400	10,700 (+300)	11,000 (+600)	11,700 (+1,300)	10,700 (+300)
RTD	360	20 (-340)	30 (-330)	60 (-300)	360 (0)

Notes: ACE = Altamont Corridor Express; LAVTA = Livermore-Amador Valley Transit Authority; RTD = San Joaquin Regional Transit District.  
 ACE ridership numbers only include boardings in San Joaquin County and the Bay Area. These numbers do not reflect boarding along potential future ACE extensions into Stanislaus and Merced Counties.  
 Source: Cambridge Systematics, 2017.

For a similar reason, RTD ridership would also drop under multiple BART Livermore Extension Build Alternatives. LAVTA ridership is expected to increase under the rail alternatives, as extended BART service increases the draw of connecting bus service. LAVTA ridership is expected to increase the most under the Express Bus/BRT Alternative, as the assumed LAVTA bus routes using the median bus/HOT lanes would attract some of the riders that would have taken the extended rail service.

Table 3.B-51 below presents the daily ridership projections under 2040 Project Conditions for surrounding transit services. Similar to 2025 Project Conditions, ACE and RTD ridership would decrease, a result of BART extended service competing with those

services, and LAVTA ridership would be expected to increase under the rail alternatives, as the extended service increases the appeal of connecting bus service.

**TABLE 3.B-51 SURROUNDING TRANSIT SERVICES RIDERSHIP (WEEKDAY BOARDINGS), 2040 PROJECT CONDITIONS**

Systemwide Boardings					
	No Project Conditions	Conventional BART Project	DMU Alternative	Express Bus/BRT Alternative	Enhanced Bus Alternative
ACE	6,900	5,500 (-1,400)	6,000 (-900)	6,500 (-400)	6,800 (-100)
LAVTA	14,700	14,300 (-400)	14,900 (+200)	16,900 (+2,200)	15,200 (+500)
RTD	340	50 (-290)	50 (-290)	80 (-260)	340 (0)

Notes: ACE = Altamont Corridor Express; LAVTA = Livermore-Amador Valley Transit Authority; RTD = San Joaquin Regional Transit District.  
 Change from No Project Conditions shown in parentheses. ACE ridership numbers only include boardings in San Joaquin County and the Bay Area. These numbers do not reflect boarding along potential future ACE extensions into Stanislaus and Merced Counties.  
 Source: Cambridge Systematics, 2017.

**No Project Alternative.** Under the No Project Alternative, the BART to Livermore Extension Project would not be implemented and there would be no physical changes in the environment associated with the Proposed Project or any of the Build Alternatives. However, planned and programmed transportation improvements for segments of I-580, local roadways and intersections, and core transit service improvements for BART, ACE, and LAVTA would be constructed. In addition, population and employment increases throughout Alameda County would result in continued land use development, including both residential and commercial. These improvements and development projects could result in potential impacts on transit access to BART, surrounding transit system inefficiencies, or ridership on surrounding transit services. However, the effects of the other projects associated with the No Project Alternative scenario have been or will be addressed in environmental documents prepared for those projects before they are implemented, and the No Project Alternative would not result in new impacts as a consequence of the BART Board of Directors’ decision not to adopt a project. Therefore, the No Project Alternative is considered to have no impact to transit access to BART, surrounding transit system inefficiencies, or ridership on surrounding transit services. **(NI)**

**Conventional BART Project.** The modified routes operated by LAVTA would experience higher productivity as a result of the improved transit service coverage under the Proposed Project in 2025 and 2040. The RTD bus route to the Dublin/Pleasanton Station currently serves a limited number of riders and would experience reductions under the

Proposed Project. ACE currently serves a higher number of riders and would also see a decrease. ACE ridership could increase if any of the BART-ACE rail connection alternatives considered in the ACEforward Draft EIR analysis are implemented. Because the changes in ridership are small compared to overall ridership for these transit services, the impacts to these transit services is not expected to be significant. Overall, impacts under the Proposed Project related to surrounding transit service ridership in 2025 and 2040 would be less than significant, and no mitigation measures are required. **(LS)**

**DMU Alternative.** The DMU Alternative's impact in 2025 and 2040 on other area transit routes is similar to that of the Proposed Project. Therefore, the DMU Alternative's impact to surrounding transit service ridership in 2025 and 2040 would be less than significant, similar to the Proposed Project, and no mitigation measures are required. **(LS)**

**Express Bus/BRT Alternative.** Under the Express Bus/BRT Alternative in 2025 and 2040, LAVTA routes would experience increased ridership, with the assumed R-B and X-B routes seeing higher ridership as the substitute for extended rail service. The RTD bus route to the Dublin/Pleasanton Station currently serves a limited number of riders and would experience reductions under the Express Bus/BRT Alternative. ACE currently serves a higher number of riders and would also see a decrease. ACE ridership could increase if any of the BART-ACE rail connection alternatives considered in the ACEforward Draft EIR analysis are implemented. Because the changes in ridership are small compared to overall ridership for these transit services, the impacts to these transit services is not expected to be significant. Overall, impacts under the Express Bus/BRT Alternative related to surrounding transit service ridership in 2025 and 2040 would be less than significant, and no mitigation measures are required. **(LS)**

**Enhanced Bus Alternative.** Other area transit services would experience the same or higher ridership as a result of the improved transit service coverage under the Enhanced Bus Alternative in 2025 and 2040. Therefore, the Enhanced Bus Alternative would have no impacts related to surrounding transit service ridership in 2025 and 2040, and no mitigation measures are required. **(NI)**

**Mitigation Measures.** As described above, the Proposed Project and Alternatives would not result in significant impacts related to surrounding transit service ridership in 2025 and 2040, and no mitigation measures are required.

## **Bicycle**

***Impact TRAN-10: Worsen bicycle level of traffic stress, bicycle circulation and access, or bicycle safety hazards compared, under 2025 or 2040 Project Conditions.***

***(No Project Alternative: NI; Conventional BART Project: B; DMU Alternative: B; Express Bus/BRT Alternative: NI; Enhanced Bus Alternative: NI)***

**No Project Alternative.** Under the No Project Alternative, the BART to Livermore Extension Project would not be implemented and there would be no physical changes in the environment associated with the Proposed Project or any of the Build Alternatives. However, planned and programmed transportation improvements for segments of I-580, local roadways and intersections, and core transit service improvements for BART, ACE, and LAVTA would be constructed. In addition, population and employment increases throughout Alameda County would result in continued land use development, including both residential and commercial. These improvements and development projects could result in potential impacts to bicycle LTS, bicycle circulation and access, or bicycle safety hazards. However, the effects of the other projects associated with the No Project Alternative scenario have been or will be addressed in environmental documents prepared for those projects before they are implemented, and the No Project Alternative would not result in new impacts as a consequence of the BART Board of Directors' decision not to adopt a project. Therefore, the No Project Alternative is considered to have no impact to bicycle LTS, bicycle circulation and access, or bicycle safety hazards. **(NI)**

**Conventional BART Project.** To connect pedestrians and cyclists to the proposed Isabel Station east of Isabel Avenue in I-580 median, the Proposed Project includes bicycle/pedestrian overcrossings both to the north and south of the freeway. One side of the overcrossing would head south over the Arroyo Las Positas and touch down in a newly expanded parking facility north of Airway Boulevard, connecting to the new extension of the Airway Boulevard bike lane previously mentioned. The other side would head north to touch down north of the westbound I-580 off-ramp and east of Isabel Avenue.

In addition, the Proposed Project would utilize the BART Station Access Guidelines (as described in Regulatory Framework) in its design of relevant station components.<sup>30</sup> BART would work with local jurisdictions to implement the bicycle access guidelines in the plans for the stations and station areas, including the City of Livermore for the proposed Isabel Station. The Proposed Project specifically aims to increase bicycle access to the new station, and in addition to the bicycle/pedestrian overcrossing of I-580, would provide new service road and bike/pedestrian way along the creek that borders the southern parking area of the new station.

With the construction of the new BART station east of Isabel Avenue in the I-580 median, new bicycle access would be possible with the construction of the pedestrian-bicycle overcrossing of I-580 that would connect the north and south sides of the freeway and the station in between. This connection would provide a route with a lower LTS than the current routes. These connections would also increase bicycle access to the new station.

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<sup>30</sup> Ibid.

The new Isabel Station would attract additional bicyclists from the surrounding neighborhoods, as shown in Figure 3.B-26. At the I-580 ramps to and from Isabel Avenue, vehicles on Isabel heading to and from I-580 necessitate bicycle merging and weaving, which bicyclists may perceive as safety hazards. To address bicycle safety and provide bicycle station access, the Proposed Project would construct a pedestrian-bicycle overcrossing of I-580 that would connect to the Isabel Station from both the north and south sides of I-580, providing an alternative crossing of I-580. Therefore, the Proposed Project would add improvements to bicycle LTS, circulation and access, and safety in 2025 and 2040 and have a beneficial impact. **(B)**

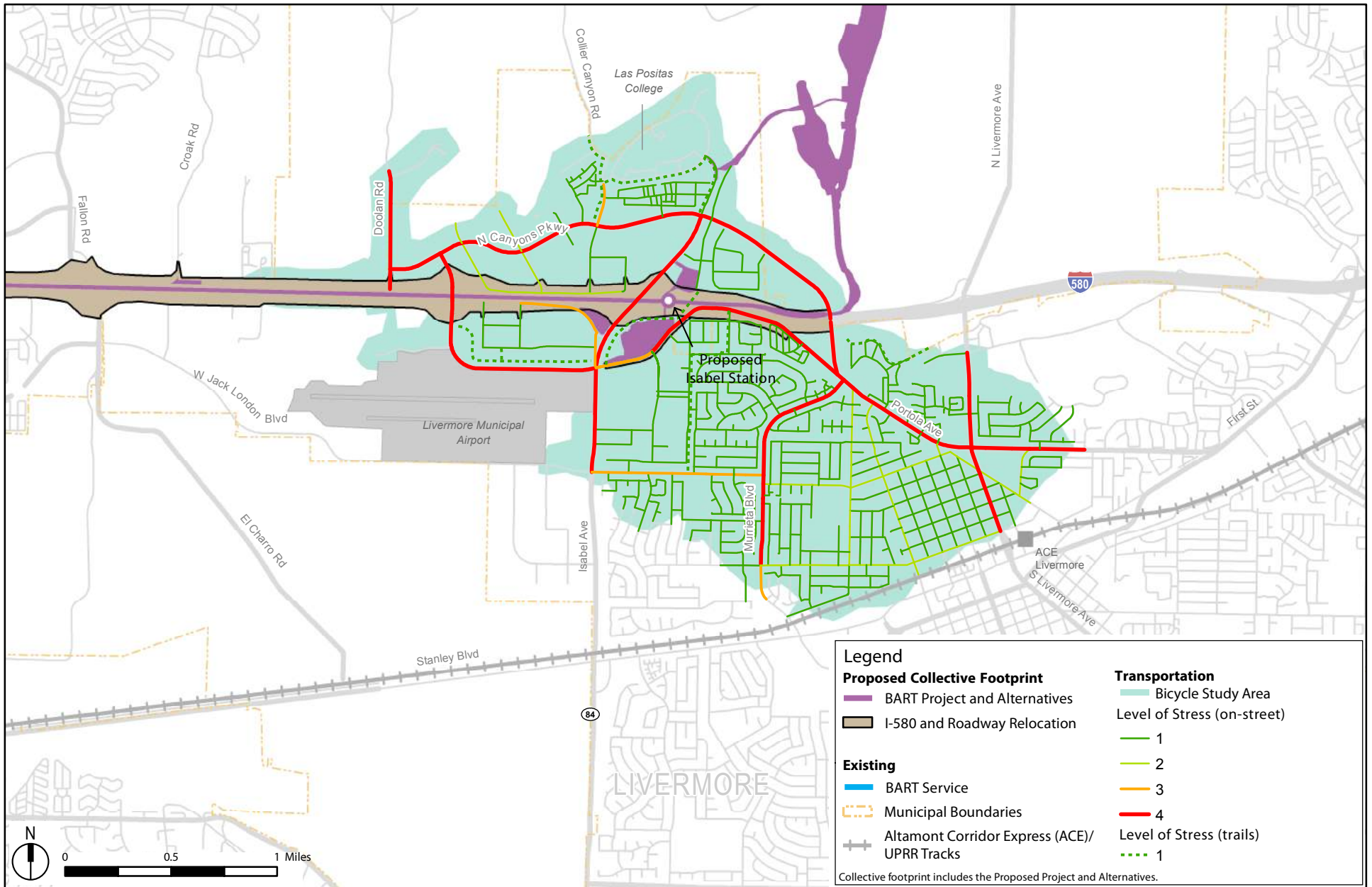
**DMU Alternative.** The DMU Alternative would have similar LTS impacts as the Proposed Project, and the new bicycle connection would provide a station access route with a lower LTS than the current routes. The DMU Alternative would have similar bicycle circulation and access impacts to the Proposed Project, as the new I-580 overcrossing would increase bicycle access to the new station. Similar to the Proposed Project, the DMU Alternative would follow the BART Station Access Guidelines to ensure that bicycle access is prioritized in the DMU Alternative design. Finally, the DMU Alternative would have similar impacts to bicycle safety as the Proposed Project. Therefore, the DMU Alternative's impact to bicycle LTS, circulation and access, and safety in 2025 and 2040 would be beneficial, similar to the Proposed Project, and no mitigation measures are required. **(B)**

**Express Bus/BRT Alternative.** The Express Bus/BRT Alternative would not make any changes to the bicycle study area. Therefore, the Express Bus/BRT Alternative would have no impacts related to bicycle LTS, circulation and access, and safety in 2025 and 2040, and no mitigation measures are required. **(NI)**

**Enhanced Bus Alternative.** The Enhanced Bus Alternative would not make any changes to the bicycle study area. Therefore, the Enhanced Bus Alternative would have no impacts related to bicycle LTS, circulation and access, and safety in 2025 and 2040, and no mitigation measures are required. **(NI)**

**Mitigation Measures.** As described above, the Proposed Project and Alternatives would not result in significant impacts related to bicycle LTS, circulation and access, or safety in 2025 and 2040, and no mitigation measures are required.





Source: Arup, 2017.

Figure 3.B-26  
 Transportation  
 Bicycle Level of Stress  
 2025 and 2040 Conventional BART Project

## Pedestrians

***Impact TRAN-11: Worsen pedestrian crossing distance or delay, circulation and access or safety hazards, under 2025 or 2040 Project Conditions.***

***(No Project Alternative: NI; Conventional BART Project: B; DMU Alternative: B; Express Bus/BRT Alternative: LS; Enhanced Bus Alternative: NI)***

The Proposed Project and Build Alternatives include numerous pedestrian improvements, including improvements to pedestrian accessibility to the Dublin/Pleasanton and Isabel Stations.

**No Project Alternative.** Under the No Project Alternative, the BART to Livermore Extension Project would not be implemented and there would be no physical changes in the environment associated with the Proposed Project or any of the Build Alternatives. However, planned and programmed transportation improvements for segments of I-580, local roadways and intersections, and core transit service improvements for BART, ACE, and LAVTA would be constructed. In addition, population and employment increases throughout Alameda County would result in continued land use development, including both residential and commercial. These improvements and development projects could result in potential impacts to pedestrian crossing distance or delay, circulation and access or safety hazards. However, the effects of the other projects associated with the No Project Alternative scenario have been or will be addressed in environmental documents prepared for those projects before they are implemented, and the No Project Alternative would not result in new impacts as a consequence of the BART Board of Directors' decision not to adopt a project. Therefore, the No Project Alternative is considered to have no impact to pedestrian crossing distance or delay, circulation and access or safety hazards. **(NI)**

**Conventional BART Project.** The Proposed Project would utilize the BART Station Access Guidelines in its design of the relevant station components. These guidelines (see Regulatory Framework section) describe design elements and principles that support pedestrian access to the new station. BART would work with local jurisdictions to implement these pedestrian access guidelines in the plans for stations and station areas, including the City of Livermore for facilities near the proposed Isabel Station. The Proposed Project at the new Isabel Station would include pedestrian access improvements, including a new sidewalk along the north side of East Airway Boulevard, and a new I-580 pedestrian overcrossing that would improve pedestrian circulation in the area. However, the Proposed Project would involve construction of a set of connecting tracks from the I-580 median to the proposed storage area north of I-580, requiring the demolition of a bridge west of Portola Avenue and replacement of the bridge east of Portola Avenue.

The key pedestrian locations in the study area are the area immediately surrounding the existing Dublin/Pleasanton and the proposed Isabel Stations, as well as the two study intersections of Isabel Avenue and Airway Boulevard and Isabel Avenue and Portola Avenue. The curb-to-curb widths for these two intersections would not change substantially from No Project Conditions under the Proposed Project.

Pedestrian crossing distances and delays in the study area for pedestrians would not change compared with No Project Conditions, as the cross-sections of the relevant roadways having pedestrian crosswalks are unaffected by the project.

Regarding pedestrian safety hazards, construction of the Proposed Project may attract additional pedestrians from the surrounding neighborhoods. Some of these pedestrians may access the station using Isabel Avenue and by crossing the I-580 ramps to and from Isabel Avenue, which may be perceived as safety hazards. There is one signalized crossing of the eastbound off-ramp, at Isabel Avenue. The other two striped crossings on the west side of Isabel Avenue—of the eastbound on-ramp from southbound Isabel Avenue and of the westbound on-ramp from southbound Isabel Avenue—are uncontrolled, with no signalization. The crossings on the east side of Isabel, including crossings of the westbound on-ramp from northbound Isabel, the eastbound on-ramp from northbound Isabel, and the westbound off-ramp, currently feature no pedestrian crossing facilities. To address pedestrian safety and provide for pedestrian station access, the Proposed Project would involve construction of a pedestrian-bicycle overcrossing of I-580 that would connect to the Isabel Station from both the north and south sides of I-580, eliminating the need for pedestrians to cross the I-580 ramps. At the Dublin/Pleasanton Station, this alternative would not make changes affecting pedestrian travel. Therefore, the impact of the Proposed Project on pedestrian crossings, circulation, and access in 2025 and 2040, would be beneficial. **(B)**

**DMU Alternative.** The DMU Alternative would feature similar pedestrian facilities in the vicinity of the proposed Isabel Station as the Proposed Project, and therefore would have similar impacts on pedestrian crossings, circulation, and access. Like the Proposed Project, the DMU Alternative would also use the BART Station Access Guidelines in its design to ensure high-quality pedestrian access.

Pedestrian safety impacts under the DMU Alternative are similar to those for the Proposed Project, except at the Dublin/Pleasanton Station where the project would involve construction of a new passenger loading platform to serve both DMU trains and BART trains, north of the northern BART tracks. Passengers transferring from BART to DMU would arrive on the existing BART platform, using vertical circulation to cross underneath the tracks and up onto the new DMU platform. Passengers transferring from DMU to BART would arrive on the new DMU platform, where they would board a BART train on the other side of the new platform. Therefore, the DMU Alternative's impact to pedestrian crossings,

circulation, and access in 2025 and 2040 would be beneficial, similar to the Proposed Project, and no mitigation measures are required. **(B)**

**Express Bus/BRT Alternative.** The Express Bus/BRT Alternative would not make any changes to the pedestrian study area, and therefore would have no impact on pedestrian access in the area.

In the area surrounding the Dublin/Pleasanton Station, the Express Bus/BRT Alternative would not make any changes to pedestrian facilities, and therefore would have no impact on pedestrian safety hazards.

This alternative also features new bus islands for passengers boarding and exiting express buses at the Dublin/Pleasanton Station, with vertical circulation allowing passengers to cross under the existing BART tracks to get to and from the existing BART platform. One bus platform would be adjacent to the I-580 westbound travel lanes and another adjacent to the I-580 eastbound lanes, which could present a pedestrian hazard. To address pedestrian safety, the Express Bus/BRT alternative would feature a physical barrier to protect and buffer passengers from high-speed motor vehicle traffic along both bus platforms. Therefore, impacts under the Express Bus/BRT Alternative related to pedestrian crossings, circulation, and access in 2025 and 2040 would be less than significant, and no mitigation measures are required. **(LS)**

**Enhanced Bus Alternative.** The Enhanced Bus Alternative would not make any changes to the pedestrian study area. Therefore, the Enhanced Bus Alternative would have no impacts related to pedestrian crossings, circulation, and access in 2025 and 2040, and no mitigation measures are required. **(NI)**

**Mitigation Measures.** As described above, the Proposed Project and Alternatives would not result in significant impacts related to pedestrian crossing distance, circulation and access, or safety in 2025 and 2040, and no mitigation measures are required.

***Impact TRAN-12: 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, under 2025 or 2040 Project Conditions.***

***(No Project Alternative: NI; Conventional BART Project: NI; DMU Alternative: NI; Express Bus/BRT Alternative: NI; Enhanced Bus Alternative: NI)***

**No Project Alternative.** Under the No Project Alternative, the BART to Livermore Extension Project would not be implemented and there would be no physical changes in the environment associated with the Proposed Project or any of the Build Alternatives. However, planned and programmed transportation improvements for segments of I-580, local roadways and intersections, and core transit service improvements for BART, ACE,

and LAVTA would be constructed. In addition, population and employment increases throughout Alameda County would result in continued land use development, including both residential and commercial. These improvements and development projects could result in potential impacts to air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks. However, the effects of the other projects associated with the No Project Alternative scenario have been or will be addressed in environmental documents prepared for those projects before they are implemented, and the No Project Alternative would not result in new impacts as a consequence of the BART Board of Directors' decision not to adopt a project. Therefore, the No Project Alternative is considered to have no impact to air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks. **(NI)**

**Conventional BART Project and Alternatives.** The Proposed Project and Build Alternatives involve changes to surface transportation only. The Livermore Municipal Airport is located within approximately 0.35 mile south of I-580 and of the project site. The slight decrease in distance between the BART system and the Livermore Municipal Airport due to the presence of the Isabel Station would not have any substantial impact on the demand for flights into and out of the airport. The Proposed Project and Build Alternatives would not encroach upon that airport's property or require relocation of any airport facilities. Therefore, the Proposed Project and Alternatives would have no impact on air traffic patterns. Impacts related to airport safety are addressed in Section 3.N, Public Health and Safety. **(NI)**

**Mitigation Measures.** As described above, the Proposed Project and Alternatives would not result in significant impacts related to air traffic patterns in 2025 and 2040, and no mitigation measures are required.

***Impact TRAN-13: Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment), under 2025 or 2040 Project Conditions.***

***(No Project Alternative: NI; Conventional BART Project: NI; DMU Alternative: NI; Express Bus/BRT Alternative: NI; Enhanced Bus Alternative: NI)***

**No Project Alternative.** Under the No Project Alternative, the BART to Livermore Extension Project would not be implemented and there would be no physical changes in the environment associated with the Proposed Project or any of the Build Alternatives. However, planned and programmed transportation improvements for segments of I-580, local roadways and intersections, and core transit service improvements for BART, ACE, and LAVTA would be constructed. In addition, population and employment increases throughout Alameda County would result in continued land use development, including

both residential and commercial. These improvements and development projects could result in potential impacts to hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment). However, the effects of the other projects associated with the No Project Alternative scenario have been or will be addressed in environmental documents prepared for those projects before they are implemented, and the No Project Alternative would not result in new impacts as a consequence of the BART Board of Directors' decision not to adopt a project. Therefore, the No Project Alternative is considered to have no impact to hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment). **(NI)**

**Conventional BART Project and Alternatives.** The Proposed Project and Alternatives would include shifts in the I-580 freeway, as well as changes to the local roadway network. These changes would be designed to be consistent with applicable State and local roadway design standards, guidelines, and policies, which State and local jurisdictions have developed in consideration of design for traffic safety. The types of expected roadway users under the Proposed Project and Build Alternatives in the vicinity of the Project would be similar to those under existing conditions, including traffic associated with commuting as well as that associated with travelers accessing local residential and commercial land uses, with low-speed traffic using local roadways and high-speed traffic using I-580. No increases in incompatible roadway uses would result from the Proposed Project or Alternatives. **(NI)**

**Mitigation Measures.** As described above, the Proposed Project and Build Alternatives would not result in significant impacts related to hazards due to a design feature in 2025 and 2040, and no mitigation measures are required.

***Impact TRAN-14: Result in inadequate emergency access under 2025 or 2040 Project Conditions.***

***(No Project Alternative: NI; Conventional BART Project: NI; DMU Alternative: NI; Express Bus/BRT Alternative: NI; Enhanced Bus Alternative: NI)***

**No Project Alternative.** Under the No Project Alternative, the BART to Livermore Extension Project would not be implemented and there would be no physical changes in the environment associated with the Proposed Project or any of the Build Alternatives. However, planned and programmed transportation improvements for segments of I-580, local roadways and intersections, and core transit service improvements for BART, ACE, and LAVTA would be constructed. In addition, population and employment increases throughout Alameda County would result in continued land use development, including both residential and commercial. These improvements and development projects could result in potential impacts to emergency access. However, the effects of the other projects

associated with the No Project Alternative scenario have been or will be addressed in environmental documents prepared for those projects before they are implemented, and the No Project Alternative would not result in new impacts as a consequence of the BART Board of Directors' decision not to adopt a project. Therefore, the No Project Alternative is considered to have no impact to emergency access. **(NI)**

**Conventional BART Project and Alternatives.** Impacts to emergency access would occur if any permanent modifications to the roadway network included blockages of roadway segments. Neither the Proposed Project, nor any of the Alternatives, would make permanent modifications that would block any of the existing roadway segments. **(NI)**

**Mitigation Measures.** As described above, the Proposed Project and Alternatives would not result in significant impacts related to emergency access in 2025 and 2040, and no mitigation measures are required.

#### **(b) Operations – Cumulative Analysis**

The Cumulative Analysis includes the impacts of the cumulative traffic generated by the Proposed Project and Build Alternatives as well as the traffic that would be generated by anticipated future projects. As described in Section 3.A, Introduction to Environmental Analysis, cumulative projects that could cause impacts combined with those caused by the Proposed Project or Build Alternatives include the added vehicle trips associated with (1) the INP combined with the Dublin/Pleasanton Station Garage Expansion for the Proposed Project and the DMU Alternative; and (2) the Dublin/Pleasanton Station Garage Expansion for the Express Bus/BRT Alternative and Enhanced Bus Alternative.

The geographic study area for cumulative impacts is the same as the project impacts study area described in the Introduction subsection above.

As described in **Impacts TRAN-12, TRAN-13, and TRAN-14** above, the Proposed Project and Build Alternatives would have no impacts related to air traffic patterns, hazards due to design features, or emergency access. Therefore, the Proposed Project and Build Alternatives would not contribute to cumulative impacts related to these issues during operations.

#### **Freeway Segments**

***Impact TRAN-15(CU): General-purpose lane freeway segments operating at unacceptable LOS, under 2025 Cumulative Conditions.***

***(No Project Alternative: NI; Conventional BART Project: LS; DMU Alternative: LS; Express Bus/BRT Alternative: LS; Enhanced Bus Alternative: LS)***

Tables 3.B-52, 3.B-53, 3.B-54, and 3.B-55 below presents the results of the general-purpose lane freeway segment LOS analysis for 2025, for the Proposed Project and Alternatives.

**No Project Alternative.** As described in **Impact TRAN-3** above, the No Project Alternative would have no impacts associated with freeway segments operating at unacceptable LOS. Therefore, the No Project Alternative would not contribute to cumulative impacts. **(NI)**

**Conventional BART Project.** For the Proposed Project under 2025 Cumulative Conditions, three general-purpose freeway segments would operate at unacceptable levels during one of the peak periods. However, these segments would operate no worse than under No Project Conditions, and the Proposed Project would not increase the V/C ratio of those segments by more than 2 percent.

The Proposed Project performs differently under 2025 Cumulative Conditions compared to 2025 Project Conditions because of the expanded garage at the Dublin/Pleasanton Station, which attracts more travelers using routes other than I-580, such as those coming from Danville using Dougherty Road.

Therefore, the Proposed Project would have a less-than-significant impact related to general-purpose lane freeway segments under 2025 Cumulative Conditions, and no mitigation measures are required. **(LS)**

**DMU Alternative.** For the DMU Alternative under 2025 Cumulative Conditions, four general-purpose freeway segments would operate at unacceptable levels during one of the peak periods. However, these segments would operate no worse than under No Project Conditions, and the alternative would not increase the V/C ratio of those segments by more than 2 percent. Therefore, the DMU Alternative would have a less-than-significant impact related to general-purpose lane freeway segments under 2025 Cumulative Conditions, and no mitigation measures are required. **(LS)**

**Express Bus/BRT Alternative.** For the Express Bus/BRT Alternative under 2025 Cumulative Conditions, five general-purpose freeway segments would operate at unacceptable levels during one of the peak periods. The Express Bus/BRT Alternative would increase the V/C ratio of one general-purpose freeway segment already operating at unacceptable LOS. However, compared with No Project Conditions, the Express Bus/BRT Alternative would not increase the V/C ratio of that segment by more than 2 percent. Therefore, impacts under the Express Bus/BRT Alternative related to general-purpose lane freeway segments under 2025 Cumulative Conditions would be less than significant, and no mitigation measures are required. **(LS)**



**TABLE 3.B-52 AM WESTBOUND I-580 GENERAL-PURPOSE FREEWAY LEVEL OF SERVICE, 2025 CUMULATIVE CONDITIONS**

#	To	From	DMU									
			No Project Alternative		Conventional BART Project		Alternative (with EMU Option)		Express Bus/BRT Alternative		Enhanced Bus Alternative	
			LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C
1	Dougherty Road/Hopyard Road	Hacienda Drive	E	0.971	E	0.982	E	0.980	E	0.973	E	0.974
2	Hacienda Drive	Tassajara Road/Santa Rita Road	E	0.995	E	0.997	E	0.999	<i>F</i>	<i>1.001</i>	<i>F</i>	<i>1.002</i>
3	Tassajara Road/Santa Rita Road	Fallon Road/ El Charro Road	F	1.004	F	1.006	F	1.007	F	1.007	F	1.008
4	Fallon Road/ El Charro Road	Airway Boulevard	E	0.975	E	0.969	E	0.974	E	0.978	E	0.976
5	Airway Boulevard	Isabel Avenue	F	1.037	E	0.997	F	1.025	F	1.044	F	1.041
6	Isabel Avenue	Livermore Avenue	F	1.051	F	1.035	F	1.043	F	1.055	F	1.055
7	Livermore Avenue	Springtown Boulevard/ First Street	E	0.984	E	0.975	E	0.976	E	0.987	E	0.988
8	Springtown Boulevard/ First Street	Vasco Road	E	0.978	E	0.980	E	0.972	E	0.979	E	0.981
9	Vasco Road	Greenville Road	E	0.977	E	0.973	E	0.974	E	0.979	E	0.977
10	Greenville Road	Carroll Road/ Flynn Road	F	1.038	F	1.038	F	1.031	F	1.039	F	1.041

Notes: LOS = level of service; V/C = volume-to-capacity ratio.  
*Italic/gray shading indicates policy-exempt intersections having a less-than-significant impact.*  
 Source: Cambridge Systematics, 2017.

**TABLE 3.B-53 PM WESTBOUND I-580 GENERAL-PURPOSE FREEWAY LEVEL OF SERVICE, 2025 CUMULATIVE CONDITIONS**

#	To	From	DMU									
			No Project Alternative		Conventional BART Project		Alternative (with EMU Option)		Express Bus/BRT Alternative		Enhanced Bus Alternative	
			LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C
1	Dougherty Road/Hopyard Road	Hacienda Drive	C	0.634	C	0.639	C	0.641	C	0.635	C	0.642
2	Hacienda Drive	Tassajara Road/Santa Rita Road	C	0.630	C	0.614	C	0.628	C	0.632	C	0.638
3	Tassajara Road/Santa Rita Road	Fallon Road/ El Charro Road	C	0.659	C	0.645	C	0.659	C	0.661	C	0.666
4	Fallon Road/ El Charro Road	Airway Boulevard	C	0.623	C	0.609	C	0.622	C	0.625	C	0.631
5	Airway Boulevard	Isabel Avenue	B	0.545	B	0.525	B	0.541	B	0.551	B	0.552
6	Isabel Avenue	Livermore Avenue	C	0.636	C	0.622	C	0.626	C	0.639	C	0.629
7	Livermore Avenue	Springtown Boulevard/ First Street	B	0.513	B	0.525	B	0.525	B	0.513	B	0.519
8	Springtown Boulevard/ First Street	Vasco Road	C	0.586	C	0.603	C	0.605	C	0.589	C	0.602
9	Vasco Road	Greenville Road	B	0.578	B	0.578	B	0.579	B	0.577	C	0.584
10	Greenville Road	Carroll Road/ Flynn Road	C	0.603	C	0.623	C	0.625	C	0.607	C	0.614

Notes: LOS = level of service; V/C = volume-to-capacity ratio.  
 Source: Cambridge Systematics, 2017.

**TABLE 3.B-54 AM EASTBOUND I-580 GENERAL-PURPOSE FREEWAY LEVEL OF SERVICE, 2025 CUMULATIVE CONDITIONS**

#	To	From	No Project Alternative		Conventional BART Project		DMU Alternative (with EMU Option)		Express Bus/BRT Alternative		Enhanced Bus Alternative	
			LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C
1	Dougherty Road/Hopyard Road	Hacienda Drive	B	0.471	B	0.466	B	0.466	B	0.470	B	0.472
2	Hacienda Drive	Tassajara Road/Santa Rita Road	B	0.532	B	0.522	B	0.528	B	0.530	B	0.535
3	Tassajara Road/Santa Rita Road	Fallon Road/ El Charro Road	B	0.567	B	0.557	B	0.563	B	0.564	B	0.570
4	Fallon Road/ El Charro Road	Airway Boulevard	B	0.547	B	0.537	B	0.543	B	0.544	B	0.549
5	Airway Boulevard	Isabel Avenue	B	0.488	B	0.459	B	0.482	B	0.486	B	0.490
6	Isabel Avenue	Livermore Avenue	B	0.537	B	0.545	B	0.543	B	0.536	B	0.537
7	Livermore Avenue	Springtown Boulevard/ First Street	B	0.519	B	0.544	B	0.535	B	0.519	B	0.518
8	Springtown Boulevard/ First Street	Vasco Road	B	0.567	C	0.602	C	0.583	B	0.566	B	0.568
9	Vasco Road	Greenville Road	B	0.571	C	0.584	B	0.574	B	0.573	B	0.573
10	Greenville Road	Carroll Road/ Flynn Road	B	0.444	B	0.455	B	0.446	B	0.447	B	0.446

Notes: LOS = level of service; V/C = volume-to-capacity ratio.  
 Source: Cambridge Systematics, 2017.

**TABLE 3.B-55 PM EASTBOUND I-580 GENERAL-PURPOSE FREEWAY LEVEL OF SERVICE, 2025 CUMULATIVE CONDITIONS**

#	To	From	No Project Alternative		Conventional BART Project		DMU Alternative (with EMU Option)		Express Bus/BRT Alternative		Enhanced Bus Alternative	
			LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C
1	Dougherty Road/Hopyard Road	Hacienda Drive	C	0.714	C	0.709	C	0.707	C	0.713	C	0.719
2	Hacienda Drive	Tassajara Road/Santa Rita Road	D	0.899	D	0.895	D	0.894	D	0.892	E	0.901
3	Tassajara Road/Santa Rita Road	Fallon Road/ El Charro Road	E	0.954	E	0.939	E	0.951	E	0.946	E	0.953
4	Fallon Road/ El Charro Road	Airway Boulevard	E	0.970	E	0.946	E	0.964	E	0.961	E	0.974
5	Airway Boulevard	Isabel Avenue	E	0.953	E	0.933	E	0.953	E	0.949	E	0.958
6	Isabel Avenue	Livermore Avenue	F	1.037	F	1.042	F	1.050	F	1.037	F	1.042
7	Livermore Avenue	Springtown Boulevard/ First Street	E	0.922	E	0.941	E	0.944	E	0.920	E	0.931
8	Springtown Boulevard/ First Street	Vasco Road	E	0.903	E	0.922	E	0.920	E	0.902	E	0.910
9	Vasco Road	Greenville Road	D	0.892	E	0.918	E	0.916	D	0.890	E	0.904
10	Greenville Road	Carroll Road/ Flynn Road	D	0.817	D	0.835	D	0.832	D	0.817	D	0.823

Notes: LOS = level of service; V/C = volume-to-capacity ratio.  
 Source: Cambridge Systematics, 2017.

**Enhanced Bus Alternative.** For the Enhanced Bus Alternative under 2025 Cumulative Conditions, five general-purpose freeway segments would operate at unacceptable levels during one of the peak periods. The Enhanced Bus Alternative would increase the V/C ratio of one general-purpose freeway segment already operating at unacceptable LOS. However, compared with No Project Conditions, the Enhanced Bus Alternative would not increase the V/C ratio of that segment by more than 2 percent. Therefore, impacts under the Enhanced Bus Alternative related to general-purpose lane freeway segments under 2025 Cumulative Conditions would be less than significant, and no mitigation measures are required. **(LS)**

**Mitigation Measures.** As described above, the Proposed Project and Alternatives, in combination with past, present, or probable future projects, would not result in significant cumulative impacts related to general-purpose lane freeway segments under 2025 Cumulative Conditions, and no mitigation measures are required.

***Impact TRAN-16(CU): General-Purpose freeway segments operating at unacceptable LOS, under 2040 Cumulative Conditions.***

***(No Project Alternative: NI; Conventional BART Project: SU; DMU Alternative: SU; Express Bus/BRT Alternative: NI; Enhanced Bus Alternative: NI)***

Tables 3.B-56, 3.B-57, 3.B-58, and 3.B-59 below present the results of the General-purpose freeway segment LOS analysis for 2040, for the Proposed Project and Build Alternatives.

**No Project Alternative.** As described in **Impact TRAN-4** above, the No Project Alternative would have no impacts related to general purpose lane freeway segments during operation. Therefore, the No Project Alternative would not contribute to cumulative impacts. **(NI)**

**Conventional BART Project.** As described in **Impact TRAN-4**, the Proposed Project 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 rather than ACE, and thus would require the use of I-580 to reach the Isabel Station. Under Cumulative Conditions, the expanded parking at the Dublin/Pleasanton Station would attract a small number of additional vehicles back onto I-580 between the Dublin/Pleasanton Station and the Isabel Station. Additionally, the INP land use growth would result in additional vehicles on I-580 both east and west of Isabel Avenue.

**TABLE 3.B-56 AM WESTBOUND I-580 GENERAL-PURPOSE FREEWAY LEVEL OF SERVICE, 2040 CUMULATIVE CONDITIONS**

#	To	From	DMU									
			No Project Alternative		Conventional BART Project		Alternative (with EMU Option)		Express Bus/BRT Alternative		Enhanced Bus Alternative	
			LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C
1	Dougherty Road/Hopyard Road	Hacienda Drive	E	0.981	E	0.978	E	0.980	E	0.983	E	0.983
2	Hacienda Drive	Tassajara Road/Santa Rita Road	F	1.004	E	0.994	E	0.996	F	1.006	F	1.007
3	Tassajara Road/Santa Rita Road	Fallon Road/ El Charro Road	F	1.020	F	1.011	F	1.013	F	1.023	F	1.022
4	Fallon Road/ El Charro Road	Airway Boulevard	E	0.995	E	0.967	E	0.979	E	0.997	E	0.997
5	Airway Boulevard	Isabel Avenue	F	1.064	F	1.027	F	1.050	F	1.067	F	1.068
6	Isabel Avenue	Livermore Avenue	F	1.103	<b>F</b>	<b>1.166</b>	<b>F</b>	<b>1.157</b>	F	1.105	F	1.104
7	Livermore Avenue	Springtown Boulevard/ First Street	F	1.026	<b>F</b>	<b>1.086</b>	<b>F</b>	<b>1.065</b>	F	1.026	F	1.024
8	Springtown Boulevard/ First Street	Vasco Road	F	1.037	<b>F</b>	<b>1.092</b>	<b>F</b>	<b>1.072</b>	F	1.035	F	1.037
9	Vasco Road	Greenville Road	F	1.071	<b>F</b>	<b>1.130</b>	<b>F</b>	<b>1.099</b>	F	1.068	F	1.069
10	Greenville Road	Carroll Road/ Flynn Road	F	1.056	<b>F</b>	<b>1.120</b>	<b>F</b>	<b>1.084</b>	F	1.061	F	1.060

Notes: LOS = level of service; V/C = volume-to-capacity ratio.  
**Bold**/gray shading indicates segments that operate at unacceptable levels.  
 Source: Cambridge Systematics, 2017.

**TABLE 3.B-57 PM WESTBOUND I-580 GENERAL-PURPOSE FREEWAY LEVEL OF SERVICE, 2040 CUMULATIVE CONDITIONS**

#	To	From	No Project Alternative		Conventional BART Project		DMU Alternative (with EMU Option)		Express Bus/BRT Alternative		Enhanced Bus Alternative	
			LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C
1	Dougherty Road/ Hopyard Road	Hacienda Drive	C	0.748	D	0.765	D	0.769	C	0.746	C	0.749
2	Hacienda Drive	Tassajara Road/Santa Rita Road	D	0.758	D	0.764	D	0.768	D	0.757	D	0.757
3	Tassajara Road/Santa Rita Road	Fallon Road/ El Charro Road	D	0.780	D	0.796	D	0.800	D	0.779	D	0.780
4	Fallon Road/ El Charro Road	Airway Boulevard	D	0.754	D	0.777	D	0.788	D	0.750	D	0.756
5	Airway Boulevard	Isabel Avenue	C	0.664	C	0.683	C	0.687	C	0.665	C	0.667
6	Isabel Avenue	Livermore Avenue	D	0.771	D	0.763	D	0.768	D	0.768	D	0.772
7	Livermore Avenue	Springtown Boulevard/ First Street	C	0.738	C	0.719	C	0.732	C	0.738	C	0.737
8	Springtown Boulevard/ First Street	Vasco Road	D	0.826	D	0.837	D	0.836	D	0.828	D	0.827
9	Vasco Road	Greenville Road	D	0.776	D	0.791	D	0.790	D	0.778	D	0.776
10	Greenville Road	Carroll Road/ Flynn Road	D	0.750	D	0.764	D	0.761	D	0.752	D	0.750

Notes: LOS = level of service; V/C = volume-to-capacity ratio.  
 Source: Cambridge Systematics, 2017.

**TABLE 3.B-58 AM EASTBOUND I-580 GENERAL-PURPOSE FREEWAY LEVEL OF SERVICE, 2040 CUMULATIVE CONDITIONS**

#	To	From	DMU									
			No Project Alternative		Conventional BART Project		Alternative (with EMU Option)		Express Bus/BRT Alternative		Enhanced Bus Alternative	
			LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C
1	Dougherty Road/Hopyard Road	Hacienda Drive	B	0.548	B	0.567	B	0.571	B	0.545	B	0.548
2	Hacienda Drive	Tassajara Road/Santa Rita Road	C	0.651	C	0.662	C	0.666	C	0.650	C	0.652
3	Tassajara Road/Santa Rita Road	Fallon Road/ El Charro Road	C	0.668	C	0.684	C	0.689	C	0.666	C	0.669
4	Fallon Road/ El Charro Road	Airway Boulevard	C	0.653	C	0.680	C	0.687	C	0.652	C	0.655
5	Airway Boulevard	Isabel Avenue	C	0.588	B	0.565	C	0.578	C	0.588	C	0.591
6	Isabel Avenue	Livermore Avenue	C	0.633	C	0.617	C	0.623	C	0.636	C	0.637
7	Livermore Avenue	Springtown Boulevard/ First Street	C	0.628	C	0.644	C	0.640	C	0.631	C	0.631
8	Springtown Boulevard/ First Street	Vasco Road	D	0.766	D	0.779	D	0.776	D	0.766	D	0.765
9	Vasco Road	Greenville Road	C	0.674	C	0.690	C	0.685	C	0.600	C	0.674
10	Greenville Road	Carroll Road/ Flynn Road	B	0.567	C	0.579	C	0.576	B	0.568	B	0.567

Notes: LOS = level of service; V/C = volume-to-capacity ratio.  
 Source: Cambridge Systematics, 2017.



**TABLE 3.B-59 PM EASTBOUND I-580 GENERAL-PURPOSE FREEWAY LEVEL OF SERVICE, 2040 CUMULATIVE CONDITIONS**

#	To	From	No Project Alternative		Conventional BART Project		DMU Alternative (with EMU Option)		Express Bus/BRT Alternative		Enhanced Bus Alternative	
			LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C
1	Dougherty Road/Hopyard Road	Hacienda Drive	C	0.684	C	0.684	C	0.681	C	0.684	C	0.686
2	Hacienda Drive	Tassajara Road/Santa Rita Road	E	0.940	E	0.937	E	0.936	E	0.940	E	0.941
3	Tassajara Road/Santa Rita Road	Fallon Road/ El Charro Road	E	0.976	E	0.976	E	0.976	E	0.978	E	0.979
4	Fallon Road/ El Charro Road	Airway Boulevard	E	0.970	E	0.974	E	0.974	E	0.967	E	0.970
5	Airway Boulevard	Isabel Avenue	E	0.992	E	0.995	<b>F</b>	<b>1.008</b>	E	0.992	E	0.995
6	Isabel Avenue	Livermore Avenue	F	1.083	<b>F</b>	<b>1.145</b>	<b>F</b>	<b>1.150</b>	F	1.086	F	1.085
7	Livermore Avenue	Springtown Boulevard/ First Street	F	1.013	<b>F</b>	<b>1.057</b>	<b>F</b>	<b>1.075</b>	F	1.011	F	1.011
8	Springtown Boulevard/ First Street	Vasco Road	F	1.016	<b>F</b>	<b>1.060</b>	<b>F</b>	<b>1.073</b>	F	1.017	F	1.020
9	Vasco Road	Greenville Road	E	0.957	E	0.993	<b>F</b>	<b>1.011</b>	E	0.950	E	0.958
10	Greenville Road	Carroll Road/ Flynn Road	D	0.816	D	0.845	D	0.858	D	0.817	D	0.817

Notes: LOS = level of service; V/C = volume-to-capacity ratio.  
**Bold**/gray shading indicates segments that operate at unacceptable levels.  
 Source: Cambridge Systematics, 2017.

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

- **Isabel Avenue to Livermore Avenue General-Purpose (Segment #6).** 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.
- **Livermore Avenue to Springtown Boulevard General-Purpose (Segment #7).** 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.
- **Springtown Boulevard to Vasco Road General-Purpose (Segment #8).** 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.
- **Vasco Road to Greenville Road General-Purpose (Segment #9).** This segment would operate at a V/C ratio of 1.130 and LOS F during the AM peak hour in the westbound direction.
- **Greenville Road to Carroll Road General-Purpose (Segment #10).** This segment would operate at a V/C ratio of 1.120 and LOS F during the AM peak hour in the westbound direction.

Typical mitigation measures that would address this type of significant impact 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. The transportation analysis already accounts for these types of planned and programmed operational improvements along the study area segments of I-580, as described in the No Project Conditions 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 Vasco Road 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, impacts for the Proposed Project related to general-purpose lane freeway segments under 2040 Cumulative Conditions would be significant and unavoidable, and no mitigation measures are feasible. (SU)

**DMU Alternative.** The DMU Alternative under 2040 Cumulative Conditions would result in similar traffic shifts as the Proposed Project, but with smaller magnitude.

Under the DMU Alternative in 2040, six general-purpose freeway segments would have a significant impact compared to No Project Conditions. Impacts would occur at the following segments:

- **Airway Boulevard to Isabel Avenue General-Purpose (Segment #5).** This segment would operate at a V/C ratio of 1.008 and LOS F during the PM peak hour in the eastbound direction.
- **Isabel Avenue to Livermore Avenue General-Purpose (Segment #6).** This segment would operate at a V/C ratio of 1.157 and LOS F during the AM peak hour in the westbound direction and a V/C ratio of 1.150 and LOS F during the PM peak hour in the eastbound direction.
- **Livermore Avenue to Springtown Boulevard General-Purpose (Segment #7).** This segment would operate at a V/C ratio of 1.065 and LOS F during the AM peak hour in the westbound direction and a V/C ratio of 1.075 and LOS F during the PM peak hour in the eastbound direction.
- **Springtown Boulevard to Vasco Road General-Purpose (Segment #8).** This segment would operate at a V/C ratio of 1.072 and LOS F during the AM peak hour in the westbound direction and a V/C ratio of 1.073 and LOS F during the PM peak hour in the eastbound direction.
- **Vasco Road to Greenville Road General-Purpose (Segment #9).** This segment would operate at a V/C ratio of 1.099 and LOS F during the AM peak hour in the westbound direction and a V/C ratio of 1.011 and LOS F during the PM peak hour in the eastbound direction.
- **Greenville Road to Carroll Road General-Purpose (Segment #10).** This freeway segment would operate at a V/C ratio of 1.084 and LOS F during the AM peak hour in the westbound direction.

Potential mitigation measures for this significant impact would include capacity enhancements and operational improvements. As described in the No Project Conditions subsection above, this analysis already accounts for planned and programmed operational improvements along the study area segments of I-580.

Additional improvements, such as capacity enhancement, are infeasible for the affected freeway segments. As described for the Proposed Project above, adding general-purpose

lanes to I-580 is infeasible due to physical constraints and would have adverse impacts to existing uses along the affected freeway segments. In addition, social and environmental impacts from induced travel demand, including degradation of air quality, increased noise, and reductions in transit use would result from adding capacity to I-580. Therefore, under 2040 Cumulative Conditions, the DMU Alternative would have a significant and unavoidable impact on general-purpose lane freeway segments, similar to the Proposed Project, and no mitigation measures are feasible. **(SU)**

**Express Bus/BRT Alternative.** For the Express Bus/BRT Alternative under 2040 Cumulative Conditions, eight express lane freeway segments would operate at unacceptable levels during one of the peak periods. However, these segments would operate no worse than under No Project Conditions. Therefore, the Express Bus/BRT Alternative would have no impacts related to general purpose lane freeway segments under 2040 Cumulative Conditions, and no mitigation measures are required. **(NI)**

**Enhanced Bus Alternative.** For the Enhanced Bus Alternative under 2040 Cumulative Conditions, eight express lane freeway segments would operate at unacceptable levels during one of the peak periods. However, these segments would operate no worse than under No Project Conditions. Therefore, the Enhanced Bus Alternative would have no impacts related to general purpose lane freeway segments under 2040 Cumulative Conditions, and no mitigation measures are required. **(NI)**

**Mitigation Measures.** As described above, the Proposed Project and DMU Alternative would have significant and unavoidable cumulative effects on general-purpose lane freeway segments as no mitigations are feasible. The Express Bus/BRT Alternative and Enhanced Bus Alternative would not contribute to cumulative impacts on general-purpose lane freeway segments and no mitigation measures are required.

***Impact TRAN-17(CU): HOV/express lane freeway segments operating at unacceptable LOS, under 2025 Cumulative Conditions.***

***(No Project Alternative: NI; Conventional BART Project: NI; DMU Alternative: NI; Express Bus/BRT Alternative: NI; Enhanced Bus Alternative: NI)***

Tables 3.B-60, 3.B-61, 3.B-62, and 3.B-63 below present the results of the HOV/express lane freeway segment LOS analysis for 2025, for the Proposed Project and Build Alternatives.

**No Project Alternative.** As described in **Impact TRAN-5** above, the No Project Alternative would have no impacts associated with a HOV/express lane freeway segments operating at unacceptable LOS. Therefore, the No Project Alternative would not contribute to cumulative impacts. **(NI)**

**TABLE 3.B-60 AM WESTBOUND I-580 HOV/EXPRESS LANE FREEWAY LEVEL OF SERVICE, 2025 CUMULATIVE CONDITIONS**

#	To	From	No Project Alternative		Conventional BART Project		DMU Alternative (with EMU Option)		Express Bus/BRT Alternative		Enhanced Bus Alternative	
			LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C
1	Dougherty Road/Hopyard Road	Hacienda Drive	E	0.978	E	0.968	E	0.974	E	0.965	E	0.976
2	Hacienda Drive	Tassajara Road/Santa Rita Road	F	1.014	F	1.004	F	1.013	F	1.001	F	1.015
3	Tassajara Road/Santa Rita Road	Fallon Road/El Charro Road	F	1.024	F	1.011	F	1.019	F	1.010	F	1.030
4	Fallon Road/El Charro Road	Airway Boulevard	E	0.990	E	0.974	E	0.988	E	0.982	E	0.993
5	Airway Boulevard	Isabel Avenue	F	1.044	E	0.994	F	1.032	F	1.030	F	1.045
6	Isabel Avenue	Livermore Avenue	F	1.055	F	1.045	F	1.055	F	1.047	F	1.062
7	Livermore Avenue	Springtown Boulevard/First Street	E	0.994	E	0.993	E	0.994	E	0.987	E	0.994
8	Springtown Boulevard/First Street	Vasco Road	E	0.981	E	0.991	E	0.985	E	0.975	E	0.990
9	Vasco Road	Greenville Road	D	0.866	D	0.869	D	0.869	D	0.854	D	0.860
10	Greenville Road	Carroll Road/Flynn Road	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Notes: N/A = not applicable; LOS = level of service; V/C = volume-to-capacity ratio.  
 Source: Cambridge Systematics, 2017.

**TABLE 3.B-61 PM WESTBOUND I-580 HOV/EXPRESS LANE FREEWAY LEVEL OF SERVICE, 2025 CUMULATIVE CONDITIONS**

#	To	From	DMU									
			No Project Alternative		Conventional BART Project		Alternative (with EMU Option)		Express Bus/BRT Alternative		Enhanced Bus Alternative	
			LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C
1	Dougherty Road/Hopyard Road	Hacienda Drive	B	0.449	B	0.431	B	0.431	B	0.451	B	0.421
2	Hacienda Drive	Tassajara Road/Santa Rita Road	B	0.448	B	0.429	B	0.429	B	0.450	B	0.419
3	Tassajara Road/Santa Rita Road	Fallon Road/ El Charro Road	B	0.474	B	0.450	B	0.455	B	0.476	B	0.450
4	Fallon Road/ El Charro Road	Airway Boulevard	B	0.473	B	0.449	B	0.453	B	0.475	B	0.447
5	Airway Boulevard	Isabel Avenue	B	0.426	B	0.414	B	0.410	B	0.430	B	0.406
6	Isabel Avenue	Livermore Avenue	B	0.421	B	0.411	B	0.404	B	0.425	B	0.400
7	Livermore Avenue	Springtown Boulevard/ First Street	B	0.366	B	0.362	B	0.356	B	0.368	A	0.346
8	Springtown Boulevard/ First Street	Vasco Road	B	0.356	B	0.353	A	0.346	B	0.359	A	0.336
9	Vasco Road	Greenville Road	A	0.180	A	0.240	A	0.244	A	0.199	A	0.207
10	Greenville Road	Carroll Road/ Flynn Road	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Notes: N/A = not applicable; LOS = level of service; V/C = volume-to-capacity ratio.  
 Source: Cambridge Systematics, 2017.

**TABLE 3.B-62 AM EASTBOUND I-580 HOV/EXPRESS LANE FREEWAY LEVEL OF SERVICE, 2025 CUMULATIVE CONDITIONS**

#	To	From	No Project Alternative		Conventional BART Project		DMU Alternative (with EMU Option)		Express Bus/BRT Alternative		Enhanced Bus Alternative	
			LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C
1	Dougherty Road/Hopyard Road	Hacienda Drive	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
2	Hacienda Drive	Tassajara Road/Santa Rita Road	A	0.291	A	0.203	A	0.247	A	0.299	A	0.293
3	Tassajara Road/Santa Rita Road	Fallon Road/ El Charro Road	A	0.293	A	0.204	A	0.249	A	0.301	A	0.295
4	Fallon Road/ El Charro Road	Airway Boulevard	A	0.147	A	0.102	A	0.125	A	0.151	A	0.148
5	Airway Boulevard	Isabel Avenue	A	0.147	A	0.102	A	0.125	A	0.151	A	0.148
6	Isabel Avenue	Livermore Avenue	A	0.147	A	0.103	A	0.125	A	0.151	A	0.148
7	Livermore Avenue	Springtown Boulevard/ First Street	A	0.147	A	0.103	A	0.125	A	0.151	A	0.148
8	Springtown Boulevard/ First Street	Vasco Road	A	0.146	A	0.102	A	0.124	A	0.150	A	0.146
9	Vasco Road	Greenville Road	A	0.000	A	0.000	A	0.000	A	0.000	A	0.000
10	Greenville Road	Carroll Road/ Flynn Road	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Notes: N/A = not applicable; LOS = level of service; V/C = volume-to-capacity ratio.  
 Source: Cambridge Systematics, 2017.

**TABLE 3.B-63 PM EASTBOUND I-580 HOV/EXPRESS LANE FREEWAY LEVEL OF SERVICE, 2025 CUMULATIVE CONDITIONS**

#	To	From	DMU									
			No Project Alternative		Conventional BART Project		Alternative (with EMU Option)		Express Bus/BRT Alternative		Enhanced Bus Alternative	
			LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C
1	Dougherty Road/Hopyard Road	Hacienda Drive	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
2	Hacienda Drive	Tassajara Road/Santa Rita Road	D	0.827	D	0.785	D	0.769	D	0.829	D	0.773
3	Tassajara Road/Santa Rita Road	Fallon Road/ El Charro Road	D	0.846	D	0.805	D	0.785	D	0.847	D	0.788
4	Fallon Road/ El Charro Road	Airway Boulevard	B	0.442	B	0.417	B	0.408	B	0.443	B	0.411
5	Airway Boulevard	Isabel Avenue	B	0.398	B	0.376	B	0.367	B	0.400	B	0.369
6	Isabel Avenue	Livermore Avenue	B	0.433	B	0.411	B	0.400	B	0.436	B	0.399
7	Livermore Avenue	Springtown Boulevard/ First Street	B	0.402	B	0.377	B	0.367	B	0.407	B	0.372
8	Springtown Boulevard/ First Street	Vasco Road	B	0.364	A	0.342	A	0.334	B	0.370	A	0.338
9	Vasco Road	Greenville Road	C	0.624	C	0.589	B	0.575	C	0.634	C	0.590
10	Greenville Road	Carroll Road/ Flynn Road	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Notes: N/A = not applicable; LOS = level of service; V/C = volume-to-capacity ratio.  
 Source: Cambridge Systematics, 2017.



**Conventional BART Project.** For the Proposed Project under 2025 Cumulative 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 Project would have no impacts related to HOV/express lane segments under 2025 Cumulative Conditions, and no mitigation measures are required. **(NI)**

**DMU Alternative.** For the DMU Alternative under 2025 Cumulative Conditions, four express lane freeway segments would operate at unacceptable levels during one of the peak periods. However, these segments would operate no worse than under No Project Conditions. Therefore, the DMU Alternative would have no impacts related to HOV/express lane segments under 2025 Cumulative Conditions, and no mitigation measures are required. **(NI)**

**Express Bus/BRT Alternative.** For the Express Bus/BRT Alternative under 2025 Cumulative Conditions, four express lane freeway segments would operate at unacceptable levels during one of the peak periods. However, these segments would operate no worse than under No Project Conditions. Therefore, the Express Bus/BRT Alternative would have no impacts related to HOV/express lane segments under 2025 Cumulative Conditions, and no mitigation measures are required. **(NI)**

**Enhanced Bus Alternative.** For the Enhanced Bus Alternative under 2025 Cumulative Conditions, four express lane freeway segments would operate at unacceptable levels during one of the peak periods. However, these segments would operate no worse than under No Project Conditions. Therefore, the Enhanced Bus Alternative would have no impacts related to HOV/express lane segments under 2025 Cumulative Conditions, and no mitigation measures are required. **(NI)**

**Mitigation Measures.** As described above, the Proposed Project and Alternatives, in combination with past, present, or probable future projects, would not result in significant cumulative impacts related to HOV/express lane freeway segments under 2025 Cumulative Conditions, and no mitigation measures are required.

***Impact TRAN-18(CU): HOV/express lane freeway segments operating at unacceptable LOS, under 2040 Cumulative Conditions.***

***(No Project Alternative: NI; Conventional BART Project: NI; DMU Alternative: NI; Express Bus/BRT Alternative: NI; Enhanced Bus Alternative: NI)***

**No Project Alternative.** As described in **Impact TRAN-6** above, the No Project Alternative would have no impacts related to HOV/express lane freeway segments during operation. Therefore, the No Project Alternative would not contribute to cumulative impacts. **(NI)**

**Conventional BART Project and Alternatives.** 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.

Tables 3.B-64, 3.B-65, 3.B-66, and 3.B-67 below presents the results of the HOV/express lane freeway segment LOS analysis under 2040 Cumulative Conditions, for the Proposed Project and Alternatives.

Under the Proposed Project and Alternatives, all HOV/express lane freeway segments would operate at acceptable levels in the 2040 cumulative analysis. **(NI)**

**TABLE 3.B-64 AM WESTBOUND I-580 HOV/EXPRESS LANE FREEWAY LEVEL OF SERVICE, 2040 CUMULATIVE CONDITIONS**

#	To	From	No Project Alternative		Conventional BART Project		DMU Alternative (with EMU Option)		Express Bus/BRT Alternative		Enhanced Bus Alternative	
			LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C
1	Dougherty Road/Hopyard Road	Hacienda Drive	B	0.466	B	0.444	B	0.455	B	0.463	B	0.465
2	Hacienda Drive	Tassajara Road/Santa Rita Road	B	0.450	B	0.429	B	0.440	B	0.447	B	0.450
3	Tassajara Road/Santa Rita Road	Fallon Road/ El Charro Road	B	0.446	B	0.425	B	0.437	B	0.443	B	0.446
4	Fallon Road/ El Charro Road	Airway Boulevard	B	0.435	B	0.416	B	0.426	B	0.434	B	0.436
5	Airway Boulevard	Isabel Avenue	B	0.399	B	0.386	B	0.395	B	0.395	B	0.398
6	Isabel Avenue	Livermore Avenue	B	0.396	B	0.383	B	0.398	B	0.394	B	0.394
7	Livermore Avenue	Springtown Boulevard/ First Street	B	0.378	B	0.365	B	0.378	B	0.375	B	0.378
8	Springtown Boulevard/ First Street	Vasco Road	A	0.349	A	0.335	A	0.345	B	0.350	B	0.356
9	Vasco Road	Greenville Road	A	0.280	A	0.286	A	0.280	A	0.277	A	0.275
10	Greenville Road	Carroll Road/ Flynn Road	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Notes: N/A = not applicable; LOS = level of service; V/C = volume-to-capacity ratio.  
 Source: Cambridge Systematics, 2017.

**TABLE 3.B-65 PM WESTBOUND I-580 HOV/EXPRESS LANE FREEWAY LEVEL OF SERVICE, 2040 CUMULATIVE CONDITIONS**

#	To	From	No Project Alternative		Conventional BART Project		DMU Alternative (with EMU Option)		Express Bus/BRT Alternative		Enhanced Bus Alternative	
			LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C
1	Dougherty Road/Hopyard Road	Hacienda Drive	A	0.214	A	0.223	A	0.221	A	0.212	A	0.215
2	Hacienda Drive	Tassajara Road/Santa Rita Road	A	0.221	A	0.231	A	0.228	A	0.219	A	0.223
3	Tassajara Road/Santa Rita Road	Fallon Road/ El Charro Road	A	0.222	A	0.229	A	0.226	A	0.221	A	0.222
4	Fallon Road/ El Charro Road	Airway Boulevard	A	0.216	A	0.223	A	0.221	A	0.215	A	0.216
5	Airway Boulevard	Isabel Avenue	A	0.202	A	0.205	A	0.204	A	0.201	A	0.202
6	Isabel Avenue	Livermore Avenue	A	0.199	A	0.196	A	0.199	A	0.196	A	0.198
7	Livermore Avenue	Springtown Boulevard/ First Street	A	0.181	A	0.179	A	0.180	A	0.181	A	0.181
8	Springtown Boulevard/ First Street	Vasco Road	A	0.174	A	0.173	A	0.173	A	0.174	A	0.174
9	Vasco Road	Greenville Road	A	0.131	A	0.131	A	0.131	A	0.131	A	0.131
10	Greenville Road	Carroll Road/ Flynn Road	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Notes: N/A = not applicable; LOS = level of service; V/C = volume-to-capacity ratio.  
 Source: Cambridge Systematics, 2017.

**TABLE 3.B-66 AM EASTBOUND I-580 HOV/EXPRESS LANE FREEWAY LEVEL OF SERVICE, 2040 CUMULATIVE CONDITIONS**

#	To	From	No Project Alternative		Conventional BART Project		DMU Alternative (with EMU Option)		Express Bus/BRT Alternative		Enhanced Bus Alternative	
			LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C
1	Dougherty Road/Hopyard Road	Hacienda Drive	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
2	Hacienda Drive	Tassajara Road/Santa Rita Road	A	0.192	A	0.194	A	0.197	A	0.188	A	0.191
3	Tassajara Road/Santa Rita Road	Fallon Road/ El Charro Road	A	0.198	A	0.203	A	0.206	A	0.194	A	0.197
4	Fallon Road/ El Charro Road	Airway Boulevard	A	0.105	A	0.107	A	0.109	A	0.103	A	0.104
5	Airway Boulevard	Isabel Avenue	A	0.102	A	0.099	A	0.103	A	0.100	A	0.101
6	Isabel Avenue	Livermore Avenue	A	0.098	A	0.097	A	0.099	A	0.097	A	0.098
7	Livermore Avenue	Springtown Boulevard/ First Street	A	0.098	A	0.097	A	0.099	A	0.097	A	0.098
8	Springtown Boulevard/ First Street	Vasco Road	A	0.096	A	0.095	A	0.097	A	0.095	A	0.096
9	Vasco Road	Greenville Road	A	0.174	A	0.172	A	0.175	A	0.173	A	0.173
10	Greenville Road	Carroll Road/ Flynn Road	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Notes: N/A = not applicable; LOS = level of service; V/C = volume-to-capacity ratio.  
 Source: Cambridge Systematics, 2017.

**TABLE 3.B-67 PM EASTBOUND I-580 HOV/EXPRESS LANE FREEWAY LEVEL OF SERVICE, 2040 CUMULATIVE CONDITIONS**

#	To	From	No Project Alternative		Conventional BART Project		DMU Alternative (with EMU Option)		Express Bus/BRT Alternative		Enhanced Bus Alternative	
			LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C
1	Dougherty Road/Hopyard Road	Hacienda Drive	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
2	Hacienda Drive	Tassajara Road/Santa Rita Road	A	0.232	A	0.227	A	0.226	A	0.234	A	0.232
3	Tassajara Road/Santa Rita Road	Fallon Road/ El Charro Road	A	0.239	A	0.234	A	0.233	A	0.241	A	0.238
4	Fallon Road/ El Charro Road	Airway Boulevard	A	0.129	A	0.128	A	0.127	A	0.127	A	0.128
5	Airway Boulevard	Isabel Avenue	A	0.124	A	0.124	A	0.125	A	0.122	A	0.122
6	Isabel Avenue	Livermore Avenue	A	0.128	A	0.135	A	0.135	A	0.127	A	0.128
7	Livermore Avenue	Springtown Boulevard/ First Street	A	0.119	A	0.123	A	0.123	A	0.120	A	0.119
8	Springtown Boulevard/ First Street	Vasco Road	A	0.109	A	0.111	A	0.111	A	0.109	A	0.109
9	Vasco Road	Greenville Road	A	0.167	A	0.166	A	0.167	A	0.166	A	0.167
10	Greenville Road	Carroll Road/ Flynn Road	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Notes: N/A = not applicable; LOS = level of service; V/C = volume-to-capacity ratio.  
 Source: Cambridge Systematics, 2017.

**Local Roadway Intersections**

**Impact TRAN-19(CU): Intersections operating at an unacceptable LOS, under 2025 Cumulative Conditions.**

**(No Project Alternative: NI; Conventional BART Project: SU; DMU Alternative: SU; Express Bus/BRT Alternative: LSM; Enhanced Bus Alternative: LSM)**

Table 3.B-68 below presents the results of the intersection LOS analysis for 2025 cumulative conditions, for the Proposed Project and Build Alternatives.

**TABLE 3.B-68 INTERSECTION LEVEL OF SERVICE AND CHANGE IN DELAY, 2025 CUMULATIVE CONDITIONS**

#	Intersection	Time	DMU									
			No Project Alternative		Conventional BART Project		Alternative (with EMU Option)		Express Bus/BRT Alternative		Enhanced Bus Alternative	
			Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
1	Dougherty Road & Amador Valley Road <sup>a</sup>	AM	30.4	C	32.0	C	37.5	D	30.6	C	30.7	C
		PM	35.0	D	38.5	D	43.2	D	24.1	C	34.8	C
2	Hopyard Road/Dougherty Road & Dublin Boulevard <sup>a</sup>	AM	43.5	D	52.2	D	50.8	D	44.1	D	44.7	D
		PM	106.9	F	109.5	F	<b>109.7</b>	<b>F</b>	<b>98.6</b>	<b>F</b>	105.0	F
3	Dougherty Road/Hopyard Road & I-580 WB Ramps <sup>a</sup>	AM	11.0	B	11.5	B	11.2	B	11.8	B	11.9	B
		PM	17.4	B	18.0	B	16.8	B	21.6	C	20.9	C
4	Hopyard Road/Dougherty Road & I-580 EB Ramps	AM	37.8	D	38.2	D	41.3	D	35.7	D	35.3	D
		PM	33.5	C	34.4	C	29.9	C	26.5	C	26.4	C
5	Hopyard Road & Owens Road	AM	33.0	C	34.4	C	33.5	C	33.3	C	33.2	C
		PM	108.7	F	<b>116.0</b>	<b>F</b>	<b>115.2</b>	<b>F</b>	110.0	F	111.5	F
6	Hopyard Road & Stoneridge Drive	AM	30.1	C	30.2	C	30.0	C	30.4	C	30.5	C
		PM	37.0	D	38.6	D	37.7	D	38.9	D	38.6	D
7	Hopyard Road & Las Positas Boulevard	AM	24.1	C	24.0	C	23.9	C	24.0	C	24.0	C
		PM	27.2	C	27.2	C	27.8	C	27.2	C	27.7	C
8	Willow Road & Owens Road	AM	11.7	B	16.4	B	11.4	B	11.9	B	12.0	B
		PM	22.7	C	23.2	C	12.9	B	13.0	B	12.9	B
9	Hacienda Drive & Dublin Boulevard <sup>a</sup>	AM	24.0	C	24.0	C	24.0	C	24.0	C	24.0	C
		PM	29.1	C	28.9	C	29.0	C	29.0	C	29.2	C
10	Hacienda Drive & Martinelli Boulevard/Hacienda Crossings <sup>a</sup>	AM	19.2	B	19.2	B	19.2	B	19.2	B	19.2	B
		PM	25.5	C	24.3	C	26.8	C	35.2	D	34.7	C
11	Hacienda Drive & I-580 WB Ramps	AM	7.4	A	7.1	A	7.4	A	8.8	A	8.7	A
		PM	8.5	A	7.4	A	9.3	A	11.2	B	10.7	B

TABLE 3.B-68 INTERSECTION LEVEL OF SERVICE AND CHANGE IN DELAY, 2025 CUMULATIVE CONDITIONS

#	Intersection	Time	DMU									
			No Project Alternative		Conventional BART Project		Alternative (with EMU Option)		Express Bus/BRT Alternative		Enhanced Bus Alternative	
			Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
12	Hacienda Drive & I-580 EB Ramps	AM	17.4	B	20.8	C	17.0	B	15.9	B	16.2	B
		PM	20.3	C	20.2	C	16.2	B	29.6	C	21.7	C
13	Hacienda Drive & Owens Road	AM	27.5	C	18.7	B	19.7	B	27.8	B	19.7	B
		PM	32.5	C	31.7	C	39.5	D	30.3	C	33.8	C
14	Tassajara Road & Dublin Boulevard <sup>a</sup>	AM	43.0	D	40.9	D	41.7	D	43.5	D	43.4	D
		PM	42.0	D	41.6	D	44.8	D	43.2	D	45.3	D
15	Tassajara Road & I-580 WB Ramps <sup>a</sup>	AM	8.8	A	9.5	A	8.8	A	10.1	B	10.2	B
		PM	9.5	A	9.4	A	10.0	A	9.5	A	9.7	A
16	Santa Rita Road & I-580 EB Ramps/Pimlico Drive	AM	17.8	B	18.3	B	17.9	B	18.3	B	18.3	B
		PM	30.6	C	30.6	C	37.5	D	32.9	C	32.8	C
17	Santa Rita Road & Valley Avenue	AM	21.7	C	21.7	C	21.9	C	21.8	C	21.8	C
		PM	45.8	D	50.2	D	48.8	D	49.5	D	49.9	D
18	Bernal Avenue/Valley Avenue & Stanley Boulevard	AM	37.4	D	37.3	D	37.3	D	37.4	D	37.4	D
		PM	32.8	C	32.7	C	32.5	C	32.8	C	32.8	C
19	Fallon Road & Dublin Boulevard <sup>a</sup>	AM	48.2	D	41.7	D	44.9	D	48.6	D	50.7	D
		PM	21.4	C	20.6	C	21.7	C	21.6	C	22.1	C
20	El Charro Road/Fallon Road & I-580 WB Ramps <sup>a</sup>	AM	8.0	A	8.2	A	8.1	A	9.0	A	9.0	A
		PM	9.4	A	9.4	A	9.1	A	8.8	A	9.1	A
21	El Charro Road & I-580 EB Ramps	AM	8.2	A	8.6	A	8.6	A	9.7	A	9.8	A
		PM	8.2	A	8.2	A	9.1	A	8.8	A	8.1	A
22	El Charro Road & Stoneridge Drive/Jack London Boulevard	AM	26.8	C	17.0	B	17.2	B	20.5	C	20.6	C
		PM	18.3	B	18.1	B	18.0	B	18.3	B	16.9	B
23	Stanley Boulevard & El Charro Road	AM	N/A <sup>2</sup>	N/A <sup>2</sup>	N/A <sup>2</sup>	N/A <sup>2</sup>	N/A <sup>2</sup>	N/A <sup>2</sup>	N/A <sup>2</sup>	N/A <sup>2</sup>	N/A <sup>2</sup>	N/A <sup>2</sup>
		PM	N/A <sup>2</sup>	N/A <sup>2</sup>	N/A <sup>2</sup>	N/A <sup>2</sup>	N/A <sup>2</sup>	N/A <sup>2</sup>	N/A <sup>2</sup>	N/A <sup>2</sup>	N/A <sup>2</sup>	N/A <sup>2</sup>
24	Airway Boulevard/Driveway & North Canyons Parkway	AM	78.7	E	53.9	D	130.4	F	84.4	F	86.4	F
		PM	13.6	B	12.2	B	26.5	C	14.0	B	14.8	B
25	Airway Boulevard & I-580 WB Ramps	AM	20.8	C	18.4	B	23.7	C	21.4	C	21.4	C
		PM	5.4	A	5.1	A	12.3	B	5.4	A	4.2	A
26	Airway Boulevard & I-580 EB Ramps/Kitty Hawk Road	AM	28.6	C	40.5	D	43.2	D	31.1	C	31.2	C
		PM	27.9	C	25.8	C	32.5	C	27.6	C	23.4	C



TABLE 3.B-68 INTERSECTION LEVEL OF SERVICE AND CHANGE IN DELAY, 2025 CUMULATIVE CONDITIONS

#	Intersection	Time	DMU									
			No Project Alternative		Conventional BART Project		Alternative (with EMU Option)		Express Bus/BRT Alternative		Enhanced Bus Alternative	
			Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
27	Collier Canyon Road & North Canyons Parkway/Portola Avenue	AM	22.9	C	24.4	C	24.0	C	25.6	C	23.8	C
		PM	25.6	C	20.7	C	26.0	C	25.7	C	26.7	C
28	Isabel Avenue/Campus Hill Drive & Portola Avenue	AM	27.9	C	28.0	C	28.0	C	28.1	C	28.1	C
		PM	25.0	C	25.5	C	27.1	C	25.2	C	25.6	C
29	Isabel Avenue & I-580 WB Ramps	AM	10.8	B	17.1	B	16.2	B	11.3	B	11.3	B
		PM	9.9	A	9.8	A	9.7	A	9.9	A	12.6	B
30	Isabel Avenue & I-580 EB Ramps	AM	6.6	A	7.8	A	7.5	A	5.9	A	6.0	A
		PM	6.6	A	8.9	A	9.4	A	6.6	A	5.8	A
31	Isabel Avenue & Airway Boulevard	AM	26.7	C	51.7	D	28.7	C	26.9	C	27.4	C
		PM	31.7	C	67.2	E	41.4	D	30.7	C	30.5	C
32	Isabel Avenue & Jack London Boulevard	AM	37.1	D	34.5	C	34.7	C	34.4	C	34.3	C
		PM	43.1	D	51.7	D	45.8	D	42.4	D	46.5	D
33	Isabel Avenue Connector & Stanley Boulevard	AM	15.7	B	15.7	B	15.8	B	16.2	B	15.8	B
		PM	15.8	B	15.9	B	19.7	B	15.0	B	17.8	B
34	Murrieta Boulevard/Driveway & Portola Avenue	AM	14.1	B	20.5	C	14.9	B	14.1	B	14.1	B
		PM	20.2	C	44.2	D	28.5	C	20.3	C	22.2	C
35	Murrieta Boulevard & Jack London Boulevard	AM	17.9	B	17.9	B	17.9	B	17.8	B	17.8	B
		PM	20.5	C	27.7	C	26.1	C	20.5	C	23.4	C
36	Murrieta Boulevard & Stanley Boulevard	AM	40.3	D	38.3	D	37.7	D	40.3	D	37.9	D
		PM	29.3	C	29.4	C	29.4	C	29.3	C	29.4	C
37	Livermore Avenue & I-580 WB Ramps	AM	21.4	C	24.7	C	21.8	C	21.4	C	21.4	C
		PM	39.3	D	14.4	B	20.2	C	19.4	B	13.2	B
38	Livermore Avenue & I-580 EB Ramps	AM	17.5	B	10.9	B	17.8	B	17.5	B	17.5	B
		PM	108.2	F	117.1	F	102.2	F	109.8	F	107.7	F
39	Livermore Avenue & Portola Avenue	AM	39.3	D	46.9	D	42.6	D	40.8	D	41.9	D
		PM	37.3	D	52.3	D	44.1	D	36.3	D	40.5	D
40	First Street/Springtown Boulevard & I-580 WB Ramps	AM	16.3	B	12.4	B	11.7	B	16.3	B	16.3	B
		PM	7.5	A	7.5	A	12.7	B	7.4	A	5.2	A
41	First Street & I-580 EB Ramps	AM	9.8	A	9.9	A	10.1	B	9.9	A	9.8	A
		PM	30.4	C	32.0	C	36.0	D	30.5	C	37.6	D

TABLE 3.B-68 INTERSECTION LEVEL OF SERVICE AND CHANGE IN DELAY, 2025 CUMULATIVE CONDITIONS

#	Intersection	Time	DMU									
			No Project Alternative		Conventional BART Project		Alternative (with EMU Option)		Express Bus/BRT Alternative		Enhanced Bus Alternative	
			Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
42	First Street & Mines Road	AM	24.2	C	24.6	C	23.0	C	24.2	C	24.6	C
		PM	48.6	D	<i>57.1</i>	<i>E</i>	<i>54.9</i>	<i>D</i>	49.9	D	<i>54.8</i>	<i>D</i>
43	Vasco Road / I-580 WB Ramps	AM	1.0	A	1.0	A	1.0	B	1.0	B	1.0	A
		PM	1.1	A	1.1	A	1.1	A	1.1	A	1.8	A
44	Vasco Road / I-580 EB Ramps	AM	0.3	A	0.3	A	0.3	A	0.3	A	0.3	A
		PM	0.7	A	0.7	A	0.7	A	0.7	A	0.7	A
45	Vasco Road & East Avenue	AM	18.8	B	18.9	B	18.1	B	18.8	B	19.0	B
		PM	42.2	D	42.1	D	41.4	D	41.3	D	42.0	D
46	Altamont Pass Road & I-580 WB Ramps	AM	123.8	F	111.8	F	121.9	F	116.8	F	112.3	F
		PM	7.0	A	6.8	A	6.9	A	6.6	A	6.4	A
47	Southfront Road & I-580 EB Ramps	AM	10.0	A	10.0	A	9.9	A	10.0	A	10.0	A
		PM	13.8	B	13.7	B	14.0	B	13.9	B	14.6	B
48	Greenville Road /Altamont Pass Road	AM	35.1	D	32.9	C	38.1	D	33.2	C	33.5	C
		PM	79.8	E	<b>80.9</b>	<b>F</b>	<b>81.4</b>	<b>F</b>	79.3	E	<b>80.6</b>	<b>F</b>
49	Greenville Road & Southfront Road	AM	8.9	A	8.9	A	8.8	A	8.8	A	8.9	A
		PM	14.2	B	14.9	B	14.6	B	11.0	B	14.3	B
50	Greenville Road / Patterson Pass Road	AM	61.7	E	63.0	E	61.1	E	62.0	E	61.1	E
		PM	132.2	F	120.9	F	<b>138.6</b>	<b>F</b>	133.6	F	<b>146.0</b>	<b>F</b>

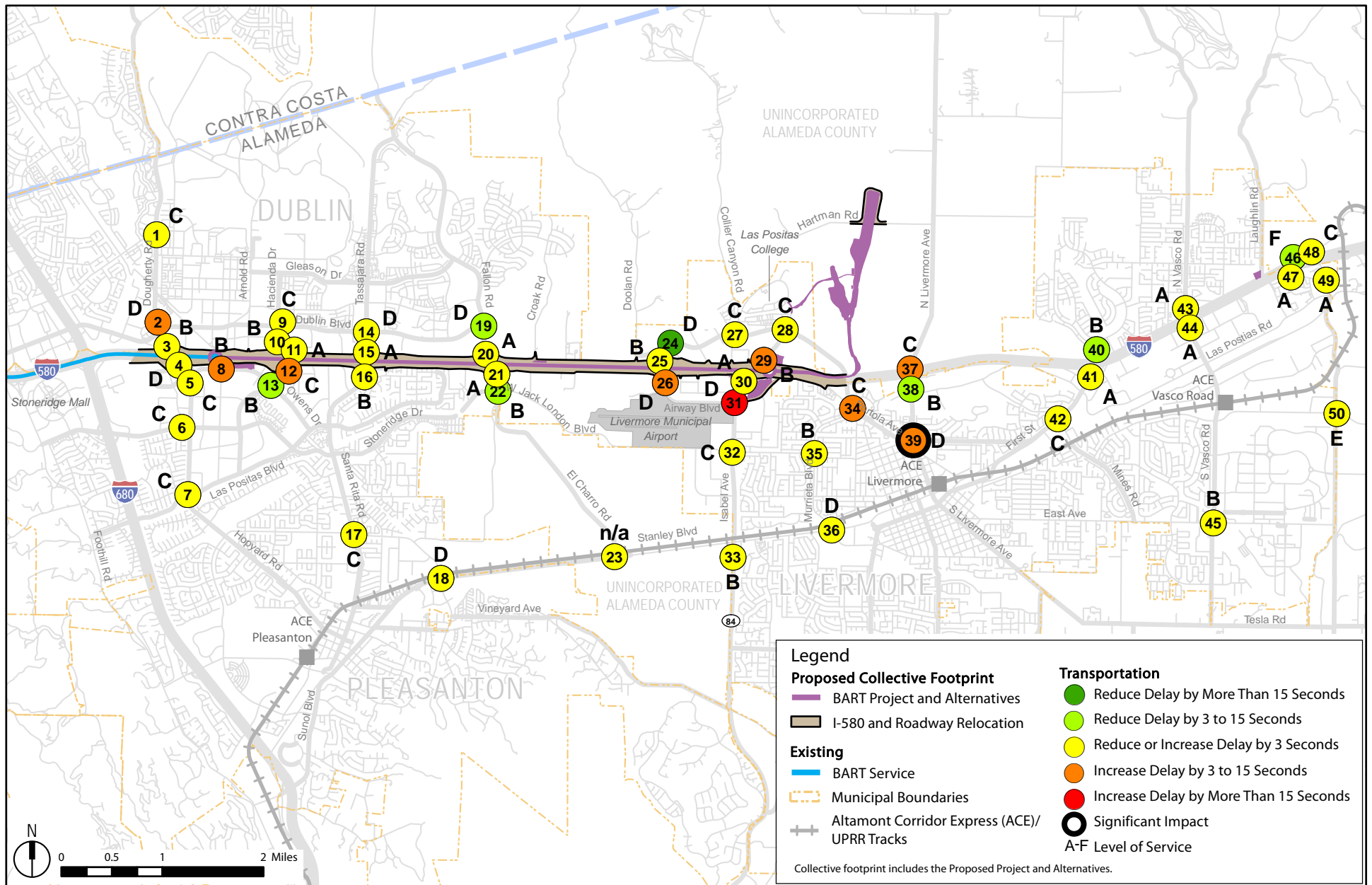
Notes: EB = eastbound; WB = westbound; N/A = not applicable; LOS = level of service; V/C = volume-to-capacity ratio. **Bold**/gray shading indicates intersections having a significant impact; *italic*/gray shading indicates policy-exempt intersections having a less-than-significant impact.

<sup>a</sup>The significant impact criteria of the Cities of Dublin and Pleasanton use added vehicle trips as a metric rather than increased delay.

Source: Cambridge Systematics, 2017.

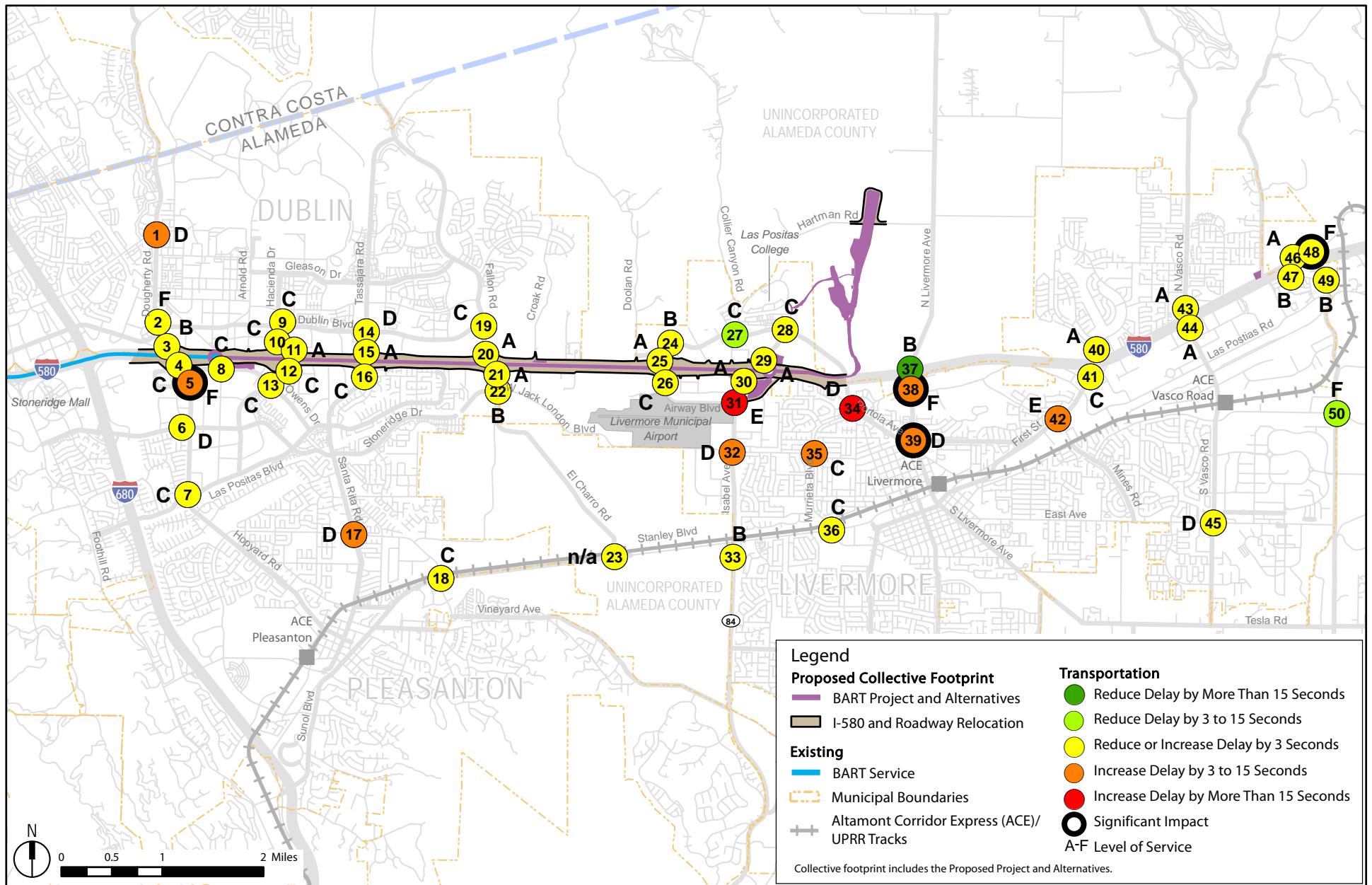
Figures 3.B-27 through 3.B-34 present the results of the intersection LOS analysis for 2025 cumulative conditions.

**No Project Alternative.** As described in **Impact TRAN-7** above, the No Project Alternative would have no impacts related to intersections during operation. Therefore, the No Project Alternative would not contribute to cumulative impacts. **(NI)**



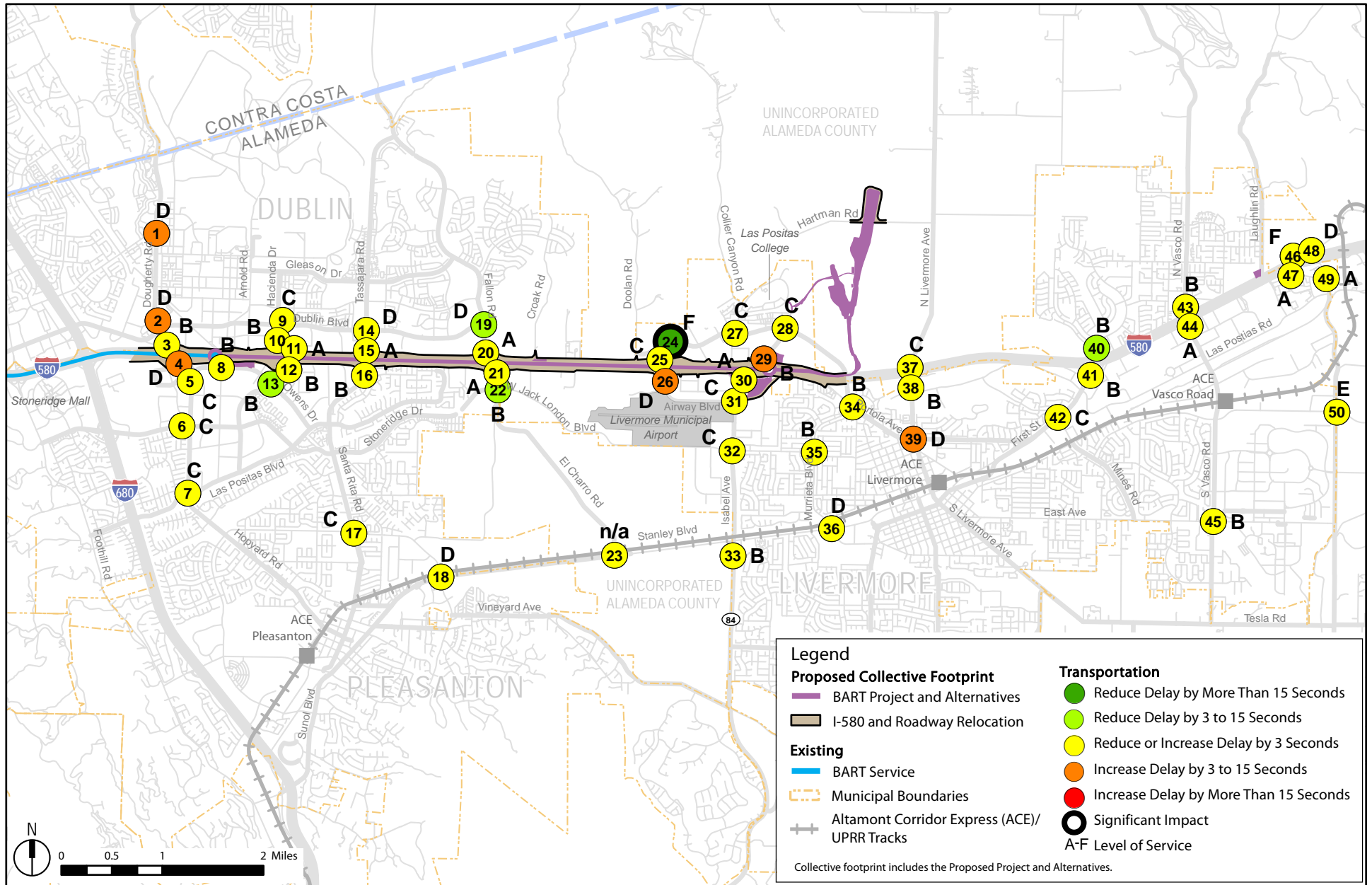
Source: Arup, 2017.

Figure 3.B- 27  
 Transportation  
 Intersection LOS and Change in AM Delay  
 2025 Cumulative Conditions, Conventional BART Project



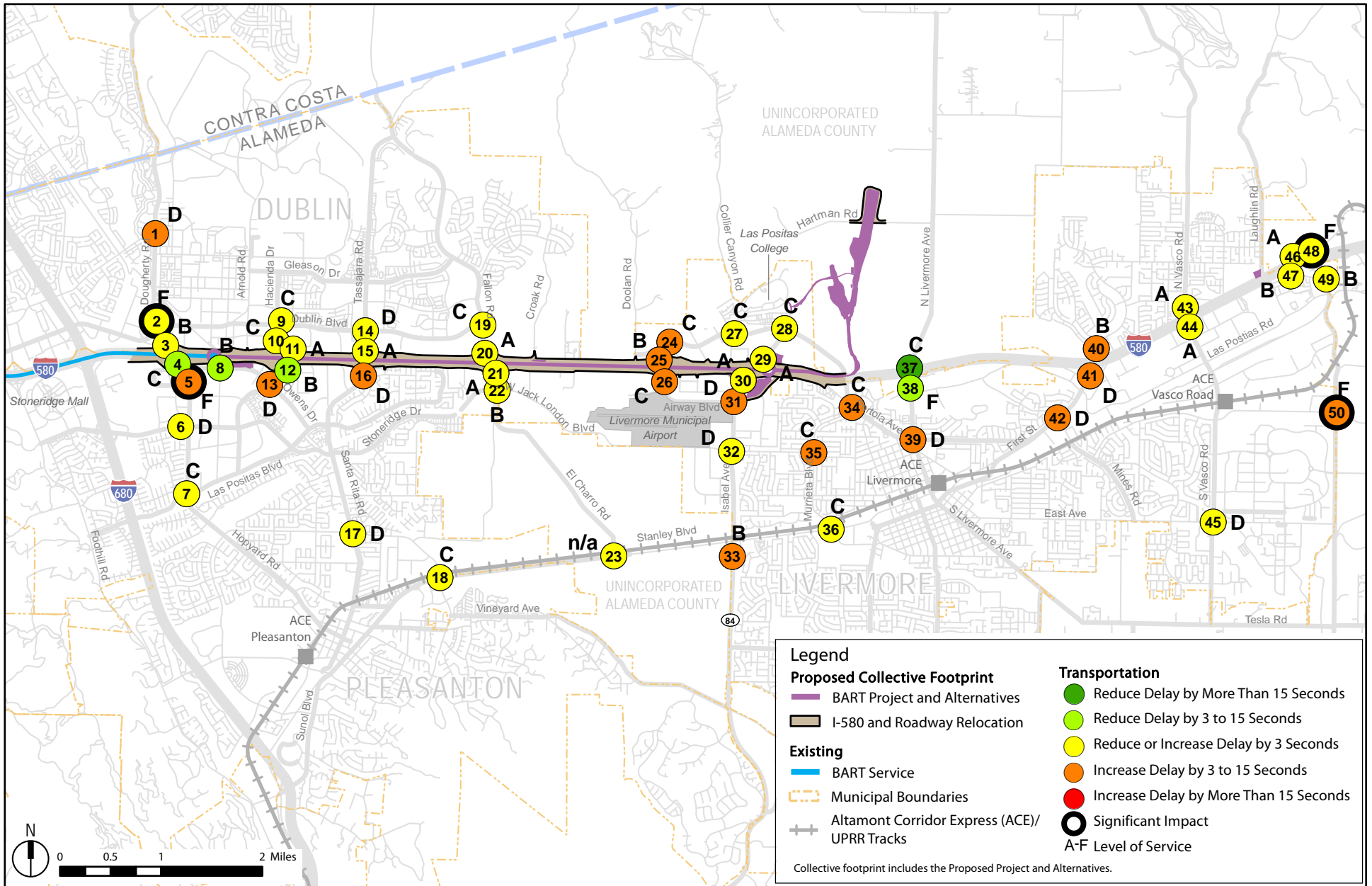
Source: Arup, 2017.

Figure 3.B-28  
 Transportation  
 Intersection LOS and Change in PM Delay  
 2025 Cumulative Conditions, Conventional BART Project



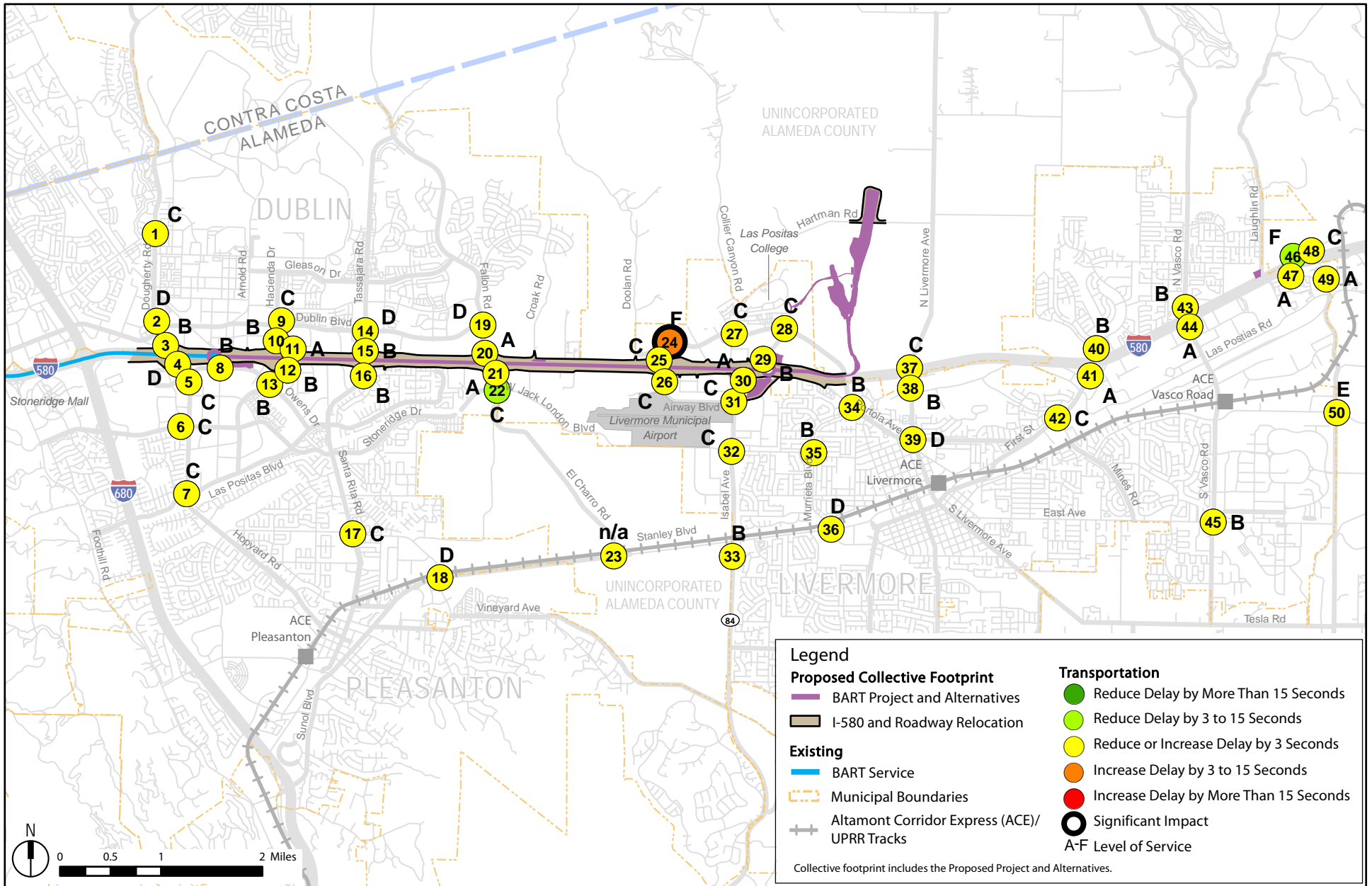
Source: Arup, 2017.

Figure 3.B-29  
 Transportation  
 Intersection LOS and Change in AM Delay  
 2025 Cumulative Conditions, DMU Alternative



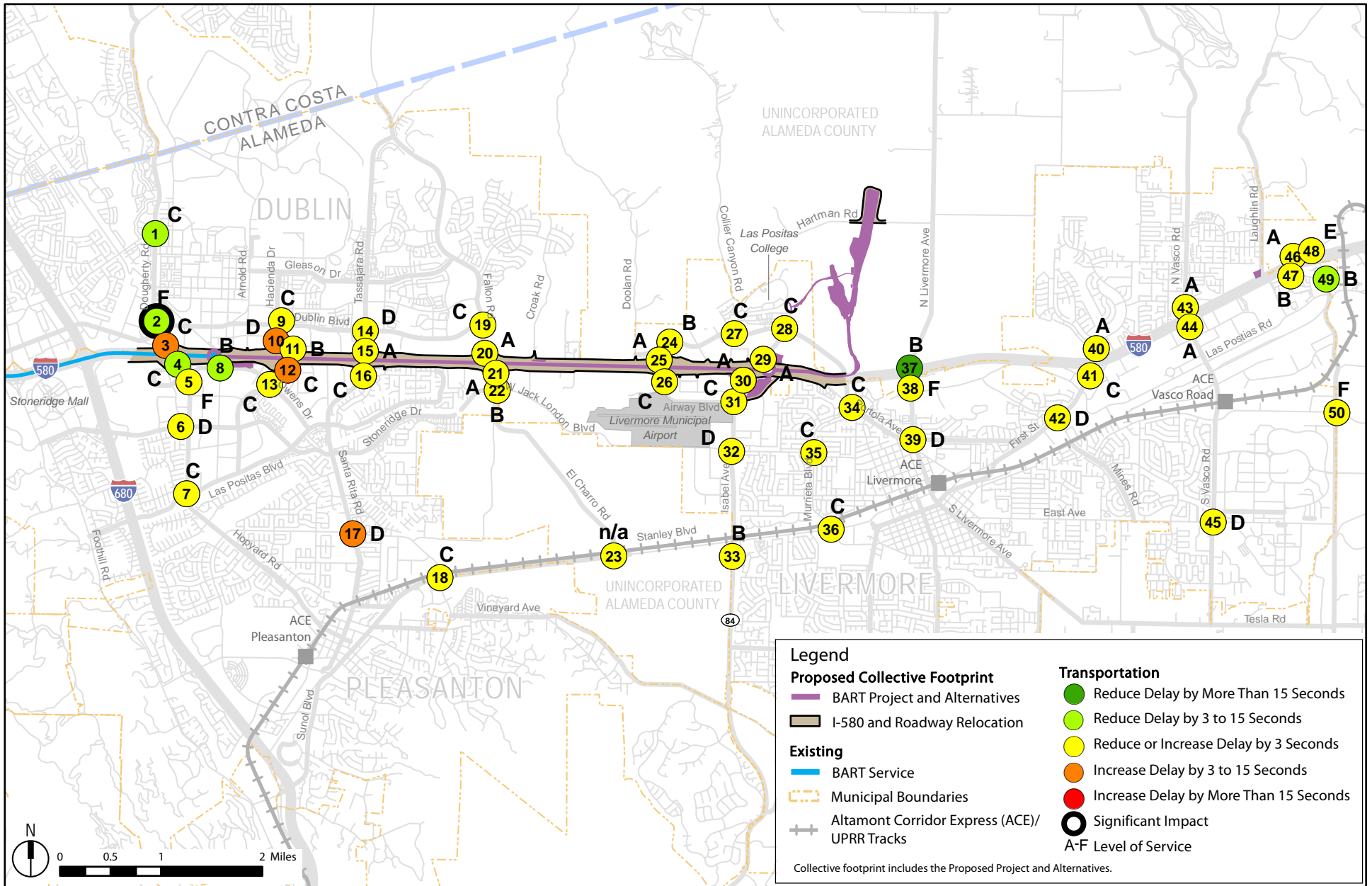
Source: Arup, 2017.

Figure 3.B- 30  
 Transportation  
 Intersection LOS and Change in PM Delay  
 2025 Cumulative Conditions, DMU Alternative



Source: Arup, 2017.

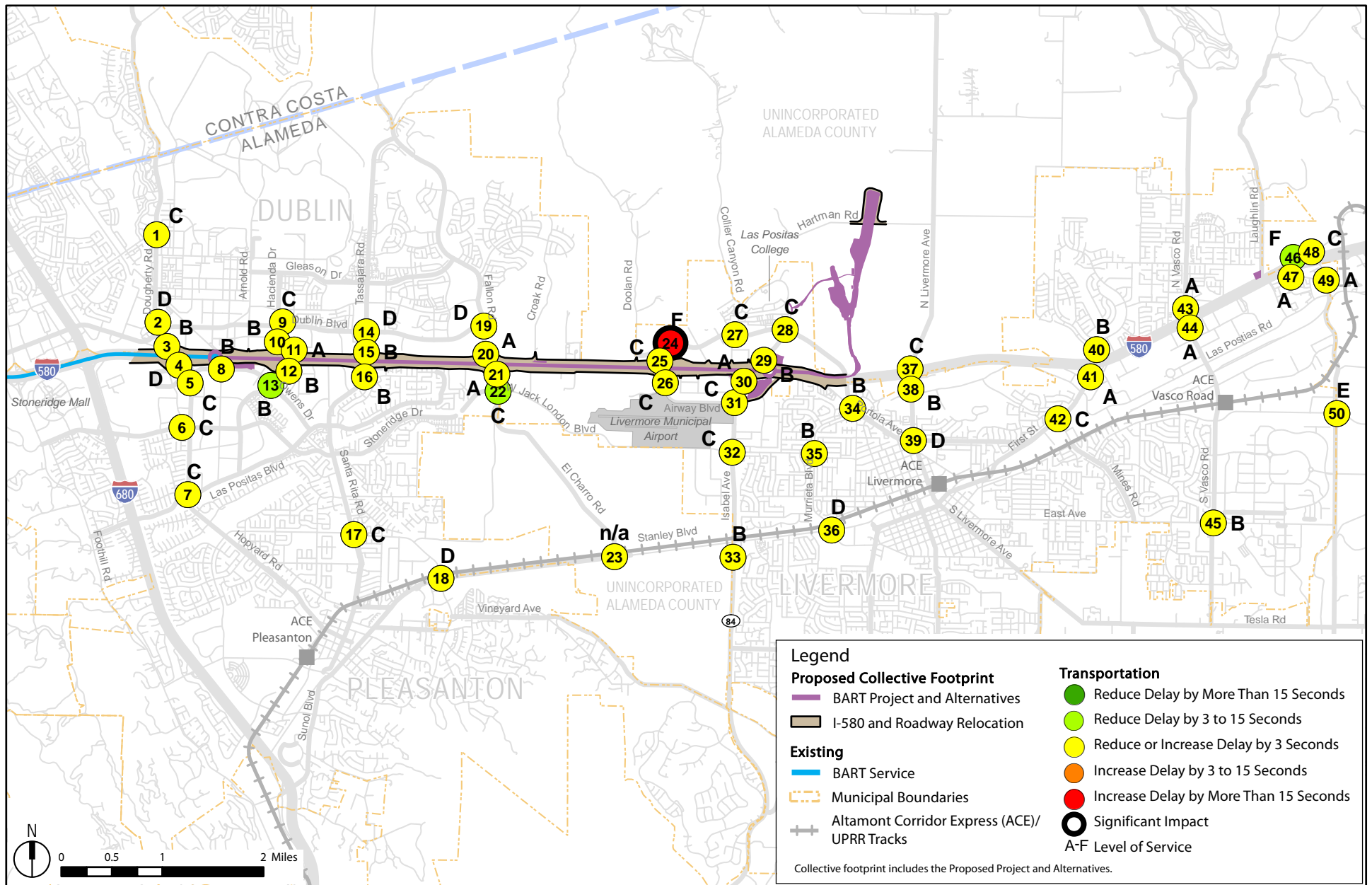
Figure 3.B-31  
 Transportation  
 Intersection LOS and Change in AM Delay  
 2025 Cumulative Conditions, Express Bus/BRT Alternative



Source: Arup, 2017.

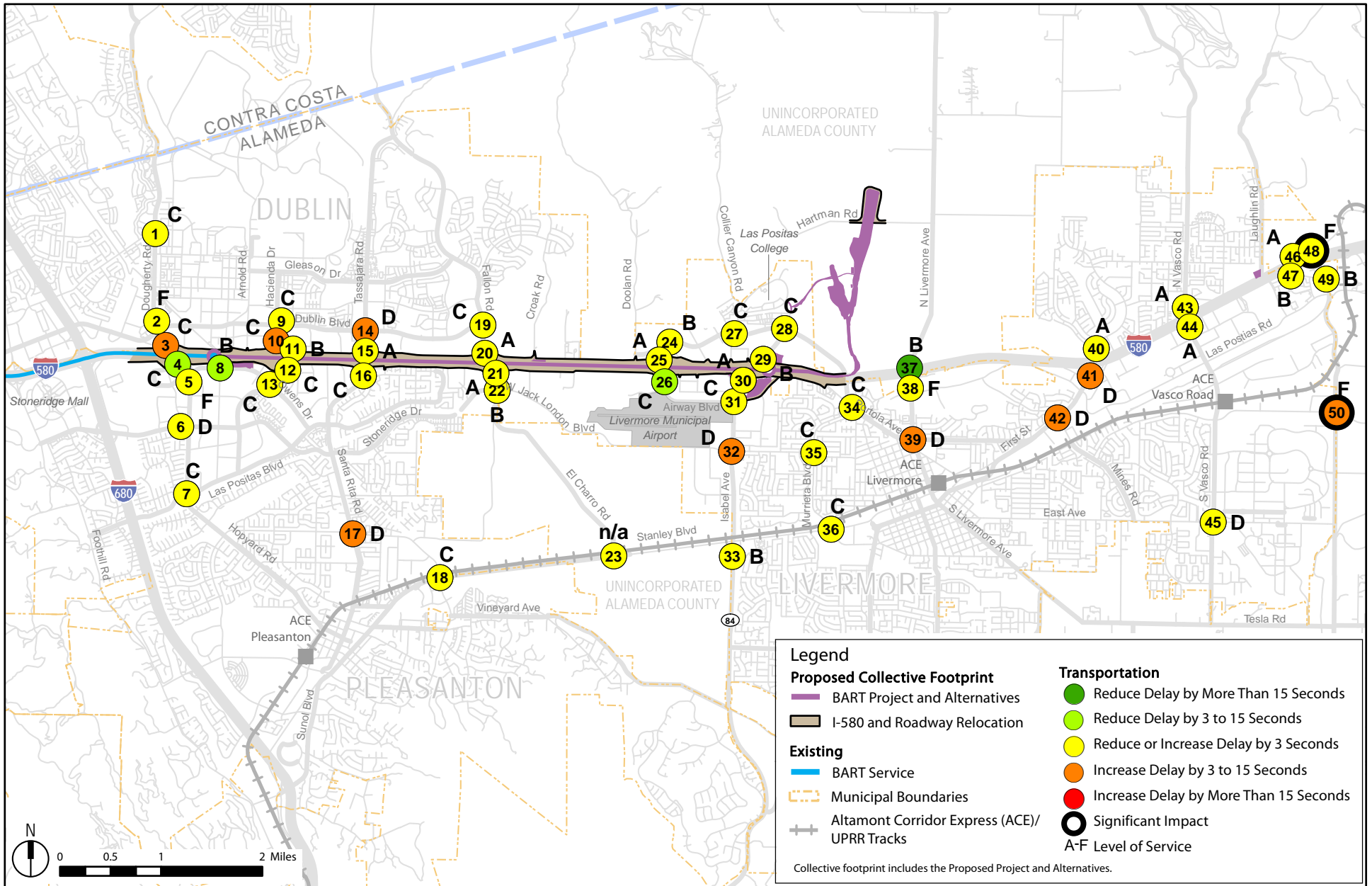
Figure 3.B- 32  
 Transportation  
 Intersection LOS and Change in PM Delay  
 2025 Cumulative Conditions, Express Bus/BRT Alternative





Source: Arup, 2017.

Figure 3.B-33  
 Transportation  
 Intersection LOS and Change in AM Delay  
 2025 Cumulative Conditions, Enhanced Bus Alternative



Source: Arup, 2017.

Figure 3.B-34  
 Transportation  
 Intersection LOS and Change in PM Delay  
 2025 Cumulative Conditions, Enhanced Bus Alternative

**Conventional BART Project.** For the Proposed Project under 2025 Cumulative Conditions, seven intersections would experience significant or less-than-significant impacts. Three of these intersections are exempt by policy from applicable LOS standards, and are therefore considered to experience less-than-significant impacts. One of the other four remaining intersections may also be exempt, but is treated here as non-exempt until the exemption is confirmed by the relevant jurisdiction.

The policy-exempt intersections are as follows:

- **Isabel Avenue & Airway Boulevard (Intersection #31).** Under 2025 Project Conditions, this intersection would operate at an LOS D with a delay of 51.7 seconds in the AM peak period and an LOS E with a delay of 67.2 seconds in the PM peak period. However, this intersection is designated as exempt from the City of Livermore's LOS standard because this intersection is near a freeway interchange.
- **Isabel Avenue & Jack London Boulevard (Intersection #32).** Under 2025 Project Conditions, this intersection would operate at an LOS D with a delay of 51.7 seconds in the PM peak period. However, this intersection is exempt from the City of Livermore's LOS standard because of environmental constraints, ROW constraints or cut-through traffic volumes or other City of Livermore policies that prevent the implementation of improvements that would achieve the City's LOS standards.
- **First Street & Mines Road (Intersection #42).** Under 2025 Project Conditions, this intersection would operate at an LOS E with a delay of 57.1 seconds in the PM peak period. However, this intersection is exempt from the City of Livermore's LOS standard because of environmental constraints, ROW constraints or cut-through traffic volumes or other City policies that prevent the implementation of improvements that would achieve the City's LOS standards.

Significant impacts would occur at the following four intersections:

- **Hopyard Road & Owens Road (Intersection #5).** Under 2025 Project Conditions, this intersection would operate at an LOS F with a delay of 116.0 seconds in the PM peak period. This intersection also has 58 additional trips under Project Conditions compared to No Project Conditions in the PM peak period, which is greater than the City of Pleasanton's threshold of 10 additional trips. However, this intersection is designated a Gateway Intersection and may be exempt from the City of Pleasanton's LOS standard if vehicular capacity improvements would be contrary to other City goals.
- **Livermore Avenue & I-580 EB Ramps (Intersection #38).** Under 2025 Project Conditions, this intersection would operate at an LOS D with a delay of 117.1 seconds in the PM peak period, which is greater than 45 seconds, the significance threshold identified for this intersection.

- **Livermore Avenue & Portola Avenue (Intersection #39).** Under 2025 Project Conditions, this intersection would operate at an LOS D with a delay of 46.9 seconds in the AM peak period and an LOS D with a delay of 52.3 seconds in the PM peak period, which is greater than 45 seconds, the significance threshold identified for this intersection.
- **Greenville Road/Altamont Pass Road (Intersection #48).** Under 2025 Project Conditions, this intersection would operate at an LOS F with a delay of 80.9 seconds in the PM peak period, which is greater than 45 seconds, the significance threshold identified for this intersection.

With the exception of Intersection #5 and Intersection #39, impacts would be reduced to less-than-significant levels with implementation of **Mitigation Measure TRAN-19a**, which requires intersection improvements such as additional turning and through lanes. **Mitigation Measure TRAN-19a** requires the addition of a second northbound left-turn lane at Intersection #39 and full eight-phase signal operations at Intersection #5. However, these intersection improvements would not be sufficient to reduce impacts to less than significant, and further lane additions would be infeasible due to physical constraints. Impacts at Intersection #5 and Intersection #39 would be significant and unavoidable. **(SU)**

**DMU Alternative.** For the DMU Alternative under 2025 Cumulative Conditions, six intersections would experience significant impacts. One of these intersections is exempt by policy from LOS standards. One of the five other remaining intersections that experience significant impacts may also be exempt by policy, but is treated here as non-exempt until the exemption is confirmed by the relevant jurisdiction.

The policy-exempt intersection is as follows:

- **First Street & Mines Road (Intersection #42).** Under 2025 Cumulative Conditions, this intersection would operate at an LOS D with a delay of 54.9 seconds in the PM peak period. However, this intersection is exempt from the City of Livermore's LOS standard because of environmental constraints, ROW constraints or cut-through traffic volumes or other City policies that prevent the implementation of improvements that would achieve the City's LOS standards.

Significant impacts would occur at the following five intersections:

- **Hopyard Road/Dougherty Road & Dublin Boulevard (Intersection #2).** Under 2025 Cumulative Conditions, this intersection would operate at an LOS F with a delay of 109.7 seconds in the PM peak period. This intersection also has 87 additional trips under the DMU Alternative compared to No Project Conditions in the PM peak period, which is greater than the City of Dublin's threshold of 50 additional trips.

- **Hopyard Road & Owens Road (Intersection #5).** Under 2025 Cumulative Conditions, this intersection would operate at an LOS F with a delay of 115.2 seconds in the PM peak period. This intersection also has 27 additional trips under the DMU Alternative compared to No Project Conditions in the PM peak period, which is greater than the City of Pleasanton's threshold of 10 additional trips. However, this intersection is designated a Gateway Intersection and may be exempt from the City of Pleasanton's LOS standard if vehicular capacity improvements would be contrary to other City goals.
- **Airway Boulevard/North Canyons Parkway (Intersection #24).** Under 2025 Cumulative Conditions, this intersection would operate at an LOS F with a delay of 130.4 seconds in the AM peak period, which is greater than 45 seconds, the significance threshold identified for this intersection.
- **Greenville Road/Altamont Pass Road (Intersection #48).** Under 2025 Cumulative Conditions, this intersection would operate at an LOS F with a delay of 81.4 seconds in the PM peak period, which is greater than 45 seconds, the significance threshold identified for this intersection.
- **Greenville Road/Altamont Pass Road (Intersection #50).** Under 2025 Cumulative Conditions, this intersection would operate at an LOS F with a delay of 138.6 seconds in the PM peak period, which is greater than 45 seconds, the significance threshold identified for this intersection.

At Intersection #2, Intersection #24, Intersection #48, and Intersection #50, significant impacts would be reduced to a less-than-significant level with implementation of **Mitigation Measure TRAN-19b**, which requires intersection improvements such as additional turning and through lanes. Impacts at Intersection #5 could not be reduced to less than significant despite the implementation proposed in **Mitigation Measure TRAN-19b**. The impact at Intersection #5 under 2025 Cumulative Conditions would therefore be significant and unavoidable. (SU)

**Express Bus/BRT Alternative.** For the Express Bus/BRT Alternative under 2025 Cumulative Conditions, two intersections would experience significant or less-than-significant impacts. Significant impacts would occur at the following two intersections:

- **Hopyard Road/Dougherty Road & Dublin Boulevard (Intersection #2).** Under 2025 Project Conditions, this intersection would operate at an LOS F with a delay of 98.6 seconds in the PM peak period. This intersection also has 56 additional trips under the Express Bus Alternative compared to No Project Conditions in the PM peak period, which is greater than the City of Dublin's threshold of 50 additional trips.
- **Airway Boulevard/North Canyons Parkway (Intersection #24).** Under 2025 Project Conditions, this intersection would operate at an LOS F with a delay of 84.4 seconds in

the AM peak period, which is greater than 45 seconds, the significance threshold identified for this intersection.

At Intersection #2 and Intersection #24, significant impacts would be reduced to less than significant with implementation of **Mitigation Measure TRAN-19c**, which requires intersection improvements such as additional turning and through lanes. **(LSM)**

**Enhanced Bus Alternative.** For the Enhanced Bus Alternative under 2025 Cumulative Conditions, four intersections would experience significant or less-than-significant impacts. One of these four intersections is exempt by policy from LOS standards.

The policy-exempt intersection is as follows:

- **First Street & Mines Road (Intersection #42).** Under 2025 Project Conditions, this intersection would operate at an LOS D with a delay of 54.8 seconds in the PM peak period. However, this intersection is exempt from the City of Livermore's LOS standard because of environmental constraints, ROW constraints or cut-through traffic volumes or other City of Livermore policies that prevent the implementation of improvements that would achieve the City's LOS standards.

Significant impacts would occur at the following three intersections:

- **Airway Boulevard/North Canyons Parkway (Intersection #24).** Under 2025 Project Conditions, this intersection would operate at an LOS F with a delay of 86.4 seconds in the AM peak period, which is greater than 45 seconds, the significance threshold identified for this intersection.
- **Greenville Road/Altamont Pass Road (Intersection #48).** Under 2025 Project Conditions, this intersection would operate at an LOS F with a delay of 80.6 seconds in the PM peak period, which is greater than 45 seconds, the significance threshold identified for this intersection.
- **Greenville Road/Altamont Pass Road (Intersection #50).** Under 2025 Project Conditions, this intersection would operate at an LOS F with a delay of 146.0 seconds in the PM peak period, which is greater than 45 seconds, the significance threshold identified for this intersection.

At Intersection #24, Intersection #48, and Intersection #50, significant impacts would be reduced to less than significant with implementation of **Mitigation Measure TRAN-19d**, which requires intersection improvements such as additional turning and through lanes. **(LSM)**

**Mitigation Measures.** As described above, the Proposed Project and Build Alternatives would have potentially significant cumulative impacts to intersections under 2025 Cumulative Conditions. **Mitigation Measure TRAN-19a**, **Mitigation Measure TRAN-19b**,

**Mitigation Measure TRAN-19c**, and **Mitigation Measure TRAN-19d** would require BART to coordinate with local jurisdictions in implementing intersection improvements and contribute fair share funding. With implementation of these mitigation measures, potential impacts would be reduced to a less-than-significant level at all intersections except for Intersection #5 (Proposed Project and DMU Alternative). Mitigation of impacts at Intersection #5 and Intersection #39 to less than significant would require further lane additions, which would be infeasible due to physical constraints. Impacts at these intersections would remain significant and unavoidable.

**Mitigation Measure TRAN-19a: Improvements for Intersections #5, #38, #39, and #48 under 2025 Cumulative Conditions (Conventional BART Project)**

BART shall coordinate with local jurisdictions to implement and contribute its fair share toward funding the following improvements at the following intersections:

- Hopyard Road & Owens Road (Intersection #5) – Create a full eight-phase signal operation. Alternatively, if this intersection is confirmed to be exempt from the City of Pleasanton’s LOS standard following consultation with the City, no mitigation is required.
- Livermore Avenue & I-580 EB Ramps (Intersection #38) – Add a dedicated northbound right-turn lane.
- Livermore Avenue & Portola Avenue (Intersection #39) – Add a second northbound left-turn lane.
- Greenville Road & WB I-580 Ramps (Intersection #48) – Add a second eastbound through lane.

**Mitigation Measure TRAN-19b: Improvements for Intersections #2, #5, #24, #48, and #50 under 2025 Cumulative Conditions (DMU Alternative/EMU Option)**

BART shall coordinate with local jurisdictions to implement and contribute its fair share toward funding the following improvements at the following intersections:

- Dougherty Road & Dublin Boulevard (Intersection #2) – Add a third southbound left-turn lane and a second westbound right-turn lane.
- Hopyard Road & Owens Road (Intersection #5) – Create a full eight-phase signal operation. Alternatively, if this intersection is confirmed to be exempt from the City of Pleasanton’s LOS standard following consultation with the City, no mitigation is required.
- Airway Boulevard/Driveway & North Canyons Parkway (Intersection #24) – Convert two existing lanes to provide two northbound left-turn lanes with protected phasing.

- Greenville Road & WB I-580 Ramps (Intersection #48) – Add a second eastbound through lane.
- Greenville Road & Patterson Pass Road (Intersection #50) – Add a second eastbound through lane and a dedicated eastbound right-turn lane.

**Mitigation Measure TRAN-19c: Improvements for Intersections #2 and #24 under 2025 Cumulative Conditions (Express Bus/BRT Alternative)**

BART shall coordinate with local jurisdictions to implement and contribute its fair share toward funding the following improvements at the following intersections:

- Dougherty Road & Dublin Boulevard (Intersection #2) – Add a third southbound left-turn lane and a second westbound right-turn lane.
- Airway Boulevard/Driveway & North Canyons Parkway (Intersection #24): Convert two existing lanes to provide two northbound left-turn lanes with protected phasing.

**Mitigation Measure TRAN-19d: Improvements for Intersections #24, #48, and #50 under 2025 Cumulative Conditions (Enhanced Bus Alternative)**

BART shall coordinate with local jurisdictions to implement and contribute its fair share toward funding the following improvements at the following intersections:

- Airway Boulevard/Driveway & North Canyons Parkway (Intersection #24): Convert two existing lanes to provide two northbound left-turn lanes with protected phasing.
- Greenville Road & WB I-580 Ramps (Intersection #48) – Add a second eastbound through lane.
- Greenville Road & Patterson Pass Road (Intersection #50) – Add a second eastbound through lane and a dedicated eastbound right-turn lane.

***Impact TRAN-20(CU): Intersections operating at an unacceptable LOS, under 2040 Cumulative Conditions.***

***(No Project Alternative: NI; Conventional BART Project: SU; DMU Alternative: SU; Express Bus/BRT Alternative: SU; Enhanced Bus Alternative: SU)***

Table 3.B-69 below presents the results of the intersection LOS analysis for 2040, for the Proposed Project and Build Alternatives.



**TABLE 3.B-69 INTERSECTION LEVEL OF SERVICE AND CHANGE IN DELAY, 2040 CUMULATIVE CONDITIONS**

#	Intersection	Time	No Project Alternative		Conventional BART (Proposed Project)		DMU Alternative (with EMU Option)		Express Bus/BRT Alternative		Enhanced Bus Alternative	
			Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
1	Dougherty Road & Amador Valley Road <sup>a</sup>	AM	98.1	F	154.2	F	143.0	F	103.4	F	104.7	F
		PM	32.6	C	38.4	D	36.8	D	32.9	C	33.4	C
2	Hopyard Road/Dougherty Road & Dublin Boulevard <sup>a</sup>	AM	101.6	F	116.2	F	107.5	F	99.3	F	101.7	F
		PM	147.9	F	177.8	F	158.4	F	152.5	F	151.4	F
3	Dougherty Road/Hopyard Road & I-580 WB Ramps <sup>a</sup>	AM	18.1	B	18.3	B	24.4	C	17.5	B	18.4	B
		PM	19.1	B	18.5	B	18.5	B	19.1	B	19.2	B
4	Hopyard Road/Dougherty Road & I-580 EB Ramps	AM	42.5	D	50.5	D	48.9	D	46.7	D	49.1	D
		PM	46.3	D	51.3	D	49.9	D	46.5	D	46.2	D
5	Hopyard Road & Owens Road	AM	32.1	C	33.5	C	33.2	C	31.6	C	31.7	C
		PM	100.7	F	108.6	F	107.8	F	102.3	F	102.7	F
6	Hopyard Road & Stoneridge Drive	AM	32.4	C	35.5	D	33.5	C	33.8	C	33.7	C
		PM	39.3	D	39.1	D	39.9	D	39.7	D	38.7	D
7	Hopyard Road & Las Positas Boulevard	AM	25.9	C	25.9	C	26.4	C	26.1	C	25.6	C
		PM	32.4	C	36.2	D	33.3	C	32.8	C	33.1	C
8	Willow Road & Owens Road	AM	12.4	B	11.7	B	11.7	B	12.7	B	12.9	B
		PM	22.4	C	25.3	C	23.3	C	23.5	C	23.3	C
9	Hacienda Drive & Dublin Boulevard <sup>a</sup>	AM	37.4	D	37.8	D	37.7	D	37.4	D	37.5	D
		PM	31.7	C	34.9	C	32.1	C	32.2	C	32.7	C
10	Hacienda Drive & Martinelli Boulevard/Hacienda Crossings <sup>a</sup>	AM	20.2	C	19.8	B	19.6	B	20.2	C	19.9	B
		PM	28.8	C	28.1	C	27.8	C	29.2	C	29.7	C
11	Hacienda Drive & I-580 WB Ramps <sup>a</sup>	AM	7.7	A	7.4	A	7.2	A	7.8	A	7.5	A
		PM	8.9	A	8.9	A	8.3	A	8.9	A	9.2	A
12	Hacienda Drive & I-580 EB Ramps	AM	18.9	B	18.4	B	18.1	B	18.8	B	18.9	B
		PM	20.7	C	22.3	C	21.7	C	21.0	C	20.8	C
13	Hacienda Drive & Owens Road	AM	23.4	C	23.8	C	23.7	C	23.4	C	23.5	C
		PM	30.5	C	33.9	C	32.2	C	30.7	C	31.2	C
14	Tassajara Road & Dublin Boulevard <sup>a</sup>	AM	50.5	D	45.9	D	46.8	D	50.6	D	50.9	D
		PM	46.2	D	46.5	D	44.4	D	46.7	D	47.7	D
15	Tassajara Road & I-580 WB Ramps <sup>a</sup>	AM	11.5	B	11.6	B	11.5	B	11.5	B	11.5	B
		PM	11.8	B	12.8	B	12.6	B	11.7	B	11.8	B
16	Santa Rita Road & I-580 EB Ramps/Pimlico Drive	AM	19.5	B	19.7	B	19.6	B	19.4	B	19.3	B
		PM	32.8	C	33.6	C	33.2	C	32.8	C	32.8	C
17	Santa Rita Road & Valley Avenue	AM	24.0	C	24.6	C	24.3	C	23.9	C	24.2	C
		PM	77.5	E	81.0	F	77.9	E	78.5	E	79.9	E

**TABLE 3.B-69 INTERSECTION LEVEL OF SERVICE AND CHANGE IN DELAY, 2040 CUMULATIVE CONDITIONS**

#	Intersection	Time	No Project Alternative		Conventional BART (Proposed Project)		DMU Alternative (with EMU Option)		Express Bus/BRT Alternative		Enhanced Bus Alternative	
			Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
18	Bernal Avenue/Valley Avenue & Stanley Boulevard	AM	38.5	D	38.4	D	38.3	D	38.4	D	38.4	D
		PM	32.6	C	32.8	C	32.8	C	32.5	C	32.5	C
19	Fallon Road & Dublin Boulevard <sup>a</sup>	AM	35.1	D	31.4	C	42.5	D	35.1	D	35.3	D
		PM	30.1	C	29.6	C	29.8	C	23.6	C	23.7	C
20	El Charro Road/Fallon Road & I-580 WB Ramps <sup>a</sup>	AM	10.8	B	8.5	A	11.0	B	11.2	B	11.1	B
		PM	9.5	A	9.5	A	10.0	B	10.9	B	10.9	B
21	El Charro Road & I-580 EB Ramps	AM	11.3	B	11.3	B	11.4	B	11.1	B	11.1	B
		PM	12.0	B	16.0	B	14.5	B	12.1	B	11.9	B
22	El Charro Road & Stoneridge Drive/Jack London Boulevard	AM	26.5	C	25.4	C	24.1	C	23.9	C	26.9	C
		PM	28.6	C	32.0	C	33.4	C	28.3	C	29.3	C
23	Stanley Boulevard & El Charro Road	AM	38.9	D	47.2	D	42.4	D	40.9	D	40.7	D
		PM	31.6	C	25.8	C	24.5	C	30.1	C	29.9	C
24	Airway Boulevard/Driveway & North Canyons Parkway	AM	98.8	F	60.2	E	96.6	F	99.7	F	96.1	F
		PM	35.7	D	24.5	C	24.2	C	33.5	C	36.4	D
25	Airway Boulevard & I-580 WB Ramps	AM	16.4	B	13.5	B	17.9	B	14.2	B	16.6	B
		PM	5.5	A	9.4	A	9.3	A	5.9	A	5.7	A
26	Airway Boulevard & I-580 EB Ramps/Kitty Hawk Road	AM	30.8	C	24.4	C	22.7	C	23.9	C	30.9	C
		PM	39.4	D	38.0	D	28.4	C	39.6	D	39.4	D
27	Collier Canyon Road & North Canyons Parkway/Portola Avenue	AM	24.0	C	33.3	C	35.2	D	23.4	C	23.5	C
		PM	22.3	C	26.8	C	23.4	C	22.6	C	22.6	C
28	Isabel Avenue/Campus Hill Drive & Portola Avenue	AM	27.7	C	28.2	C	28.4	C	27.7	C	27.8	C
		PM	27.5	C	45.4	D	43.9	D	27.9	C	28.3	C
29	Isabel Avenue & I-580 WB Ramps	AM	11.5	B	15.2	B	14.9	B	12.9	B	11.2	B
		PM	14.4	B	16.2	B	16.3	B	14.3	B	14.2	B
30	Isabel Avenue & I-580 EB Ramps	AM	6.1	A	8.0	A	7.5	A	7.4	A	6.2	A
		PM	6.4	A	24.3	C	15.7	B	6.2	A	6.2	A
31	Isabel Avenue & Airway Boulevard	AM	34.3	C	77.8	E	63.2	E	34.0	C	34.8	C
		PM	36.4	D	82.3	F	86.2	F	41.0	D	40.9	D
32	Isabel Avenue & Jack London Boulevard	AM	50.6	D	57.4	E	53.0	D	50.9	D	50.7	D
		PM	79.8	E	82.2	F	78.1	E	80.7	F	81.8	F

**TABLE 3.B-69 INTERSECTION LEVEL OF SERVICE AND CHANGE IN DELAY, 2040 CUMULATIVE CONDITIONS**

#	Intersection	Time	No Project Alternative		Conventional BART (Proposed Project)		DMU Alternative (with EMU Option)		Express Bus/BRT Alternative		Enhanced Bus Alternative	
			Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
33	Isabel Avenue Connector & Stanley Boulevard	AM	40.5	D	42.1	D	38.2	D	38.2	D	43.3	D
		PM	73.8	E	75.4	E	77.1	E	73.9	E	72.6	E
34	Murrieta Boulevard/Driveway & Portola Avenue	AM	14.5	B	17.1	B	18.2	B	14.6	B	14.6	B
		PM	33.7	C	44.3	D	34.6	C	32.5	C	33.5	C
35	Murrieta Boulevard & Jack London Boulevard	AM	25.0	C	30.8	C	31.1	C	24.2	C	26.8	C
		PM	100.7	F	<b>129.8</b>	<b>F</b>	<b>110.1</b>	<b>F</b>	75.3	E	80.1	F
36	Murrieta Boulevard & Stanley Boulevard	AM	98.3	F	<i>104.3</i>	<i>F</i>	99.8	F	80.3	F	80.8	F
		PM	45.8	D	<i>51.2</i>	<i>D</i>	<i>62.9</i>	<i>E</i>	46.3	D	48.4	D
37	Livermore Avenue & I-580 WB Ramps	AM	23.5	C	23.4	C	22.5	C	21.9	C	34.1	C
		PM	27.8	C	27.6	C	26.6	C	32.8	C	39.3	D
38	Livermore Avenue & I-580 EB Ramps	AM	17.5	B	16.3	B	16.5	B	14.7	B	17.5	B
		PM	74.3	E	<b>90.6</b>	<b>F</b>	75.7	E	75.5	E	72.7	E
39	Livermore Avenue & Portola Avenue	AM	43.8	D	<b>48.3</b>	<b>D</b>	41.1	D	42.5	D	44.4	D
		PM	52.6	D	<b>88.7</b>	<b>F</b>	<b>68.5</b>	<b>E</b>	50.0	D	48.9	D
40	First Street/Springtown Boulevard & I-580 WB Ramps	AM	16.3	B	10.3	B	10.2	B	10.2	B	16.7	B
		PM	14.1	B	16.8	B	13.0	B	14.0	B	14.1	B
41	First Street & I-580 EB Ramps	AM	14.5	B	12.5	B	12.1	B	11.9	B	14.5	B
		PM	47.1	D	42.6	D	46.2	D	47.4	D	47.3	D
42	First Street & Mines Road	AM	26.2	C	26.4	C	25.5	C	26.3	C	26.4	C
		PM	52.1	D	<b>105.9</b>	<b>F</b>	<b>78.4</b>	<b>E</b>	<b>58.5</b>	<b>E</b>	<b>60.0</b>	<b>E</b>
43	Vasco Road / I-580 WB Ramps	AM	0.7	A	0.6	A	0.6	A	0.7	A	0.7	A
		PM	1.7	A	1.9	A	1.9	A	1.7	A	1.7	A
44	Vasco Road / I-580 EB Ramps	AM	N/A <sup>4</sup>	N/A <sup>4</sup>	N/A <sup>4</sup>	N/A <sup>4</sup>	N/A <sup>4</sup>	N/A <sup>4</sup>	N/A <sup>4</sup>	N/A <sup>4</sup>	N/A <sup>4</sup>	N/A <sup>4</sup>
		PM	N/A <sup>4</sup>	N/A <sup>4</sup>	N/A <sup>4</sup>	N/A <sup>4</sup>	N/A <sup>4</sup>	N/A <sup>4</sup>	N/A <sup>4</sup>	N/A <sup>4</sup>	N/A <sup>4</sup>	N/A <sup>4</sup>
45	Vasco Road & East Avenue	AM	20.9	C	20.6	C	19.0	B	20.8	C	21.3	C
		PM	87.4	F	<b>104.4</b>	<b>F</b>	88.8	F	92.0	F	87.6	F
46	Greenville Road & I-580 WB Ramps	AM	8.8	A	7.6	A	6.8	A	7.4	A	9.1	A
		PM	5.3	A	7.1	A	5.6	A	5.5	A	5.5	A
47	Greenville Road & I-580 EB Ramps	AM	4.2	A	1.8	A	1.9	A	4.5	A	4.3	A
		PM	9.2	A	9.2	A	7.4	A	8.2	A	8.7	A
48	Greenville Road /Altamont Pass Road	AM	7.1	A	13.3	B	15.6	B	7.3	A	7.1	A
		PM	96.1	F	<b>118.3</b>	<b>F</b>	<b>106.6</b>	<b>F</b>	100.9	F	100.2	F

**TABLE 3.B-69 INTERSECTION LEVEL OF SERVICE AND CHANGE IN DELAY, 2040 CUMULATIVE CONDITIONS**

#	Intersection	Time	No Project Alternative		Conventional BART (Proposed Project)		DMU Alternative (with EMU Option)		Express Bus/BRT Alternative		Enhanced Bus Alternative	
			Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
49	Greenville Road & Southfront Road	AM	14.3	B	8.4	A	8.2	A	8.8	A	13.8	B
		PM	13.9	B	14.6	B	29.2	C	14.0	B	14.1	B
50	Greenville Road / Patterson Pass Road	AM	40.6	D	44.8	D	<b>49.9</b>	<b>D</b>	39.5	D	39.2	D
		PM	156.3	F	<b>201.3</b>	<b>F</b>	<b>173.1</b>	<b>F</b>	<b>183.4</b>	<b>F</b>	<b>177.2</b>	<b>F</b>

Notes: EB = eastbound; WB = westbound; LOS = level of service; N/A = not applicable.

**Bold/gray shading** indicates intersection having a significant impact; *italic/gray shading* indicates policy-exempt intersections having a less-than-significant impact.

<sup>a</sup>The significant impact criteria of the Cities of Dublin and Pleasanton use added vehicle trips as a metric rather than increased delay.

Source: Cambridge Systematics, 2017.

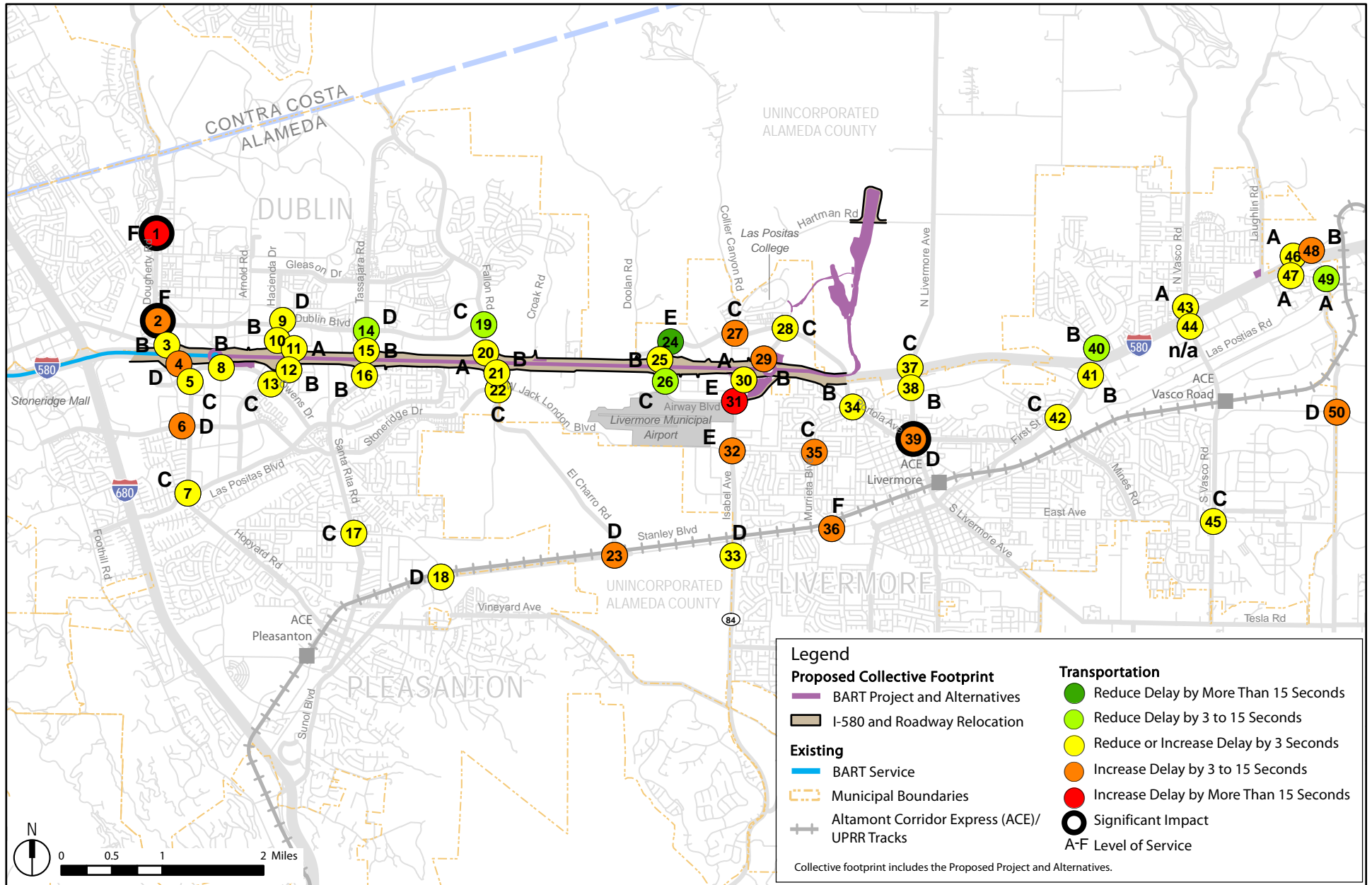
Figures 3.B-35 through 3.B-42 present the results of the intersection LOS analysis for 2040 cumulative conditions.

**No Project Alternative.** As described in **Impact TRAN-8** above, the No Project Alternative would have no impacts related to intersections during operation. Therefore, the No Project Alternative would not contribute to cumulative impacts. **(NI)**

**Conventional BART Project.** For the Proposed Project under 2040 Cumulative Conditions, thirteen intersections would experience significant impacts. Four of these intersections are exempt by policy from applicable LOS standards.

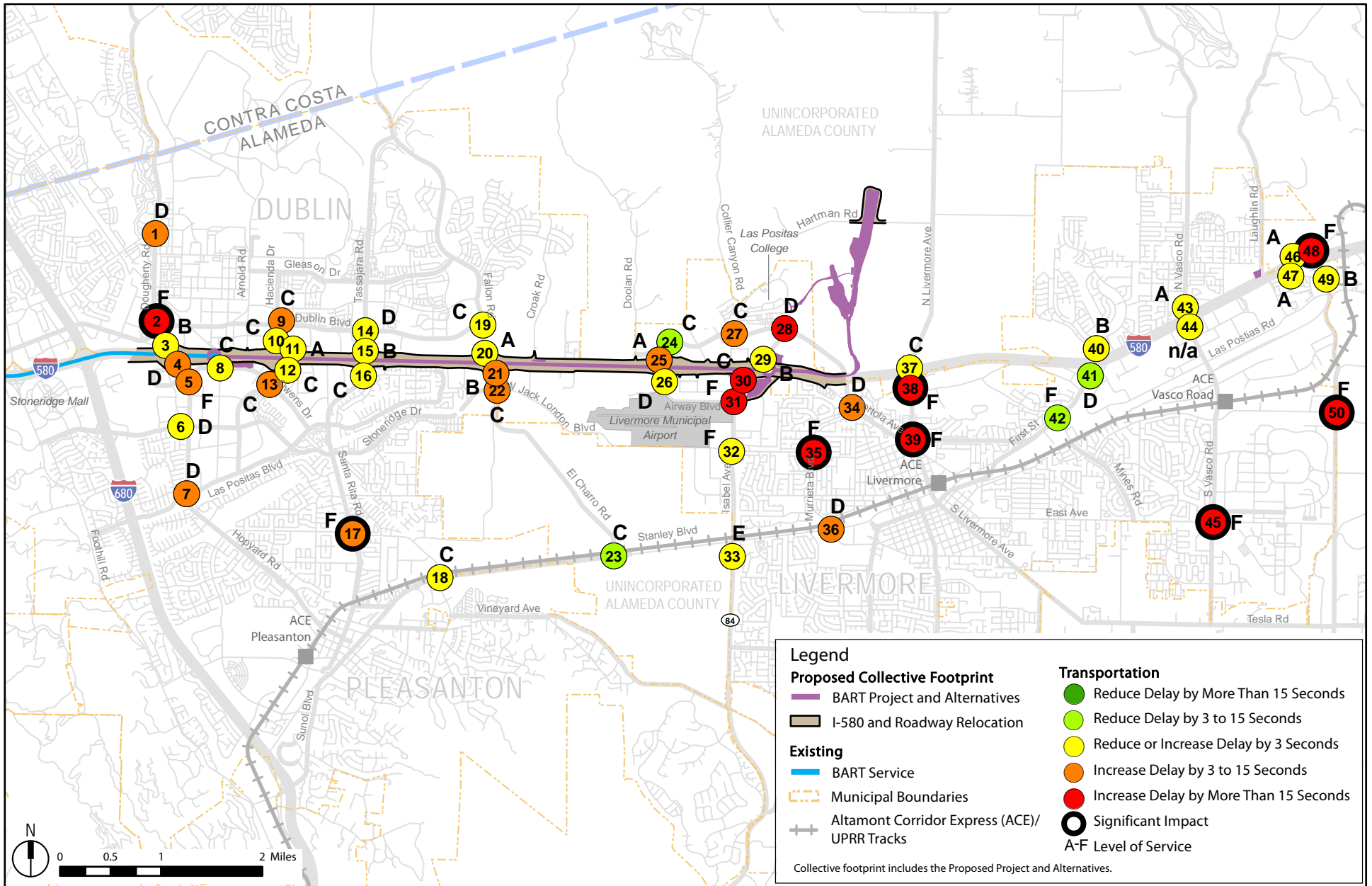
The policy-exempt intersections are as follows:

- **Isabel Avenue & Airway Boulevard (Intersection #31).** Under 2040 Project Conditions, this intersection would operate at an LOS E with a delay of 77.8 seconds in the AM peak period and an LOS F with a delay of 82.3 seconds in the PM peak period. However, this intersection is designated as exempt from the City of Livermore’s LOS standard because this intersection is near a freeway interchange.
- **Isabel Avenue & Jack London Boulevard (Intersection #32).** Under 2040 Project Conditions, this intersection would operate at an LOS E with a delay of 57.4 seconds in the AM peak period. However, this intersection is exempt from the City of Livermore’s LOS standard because of environmental constraints, ROW constraints or cut-through traffic volumes or other City of Livermore policies that prevent the implementation of improvements that would achieve the City’s LOS standards.



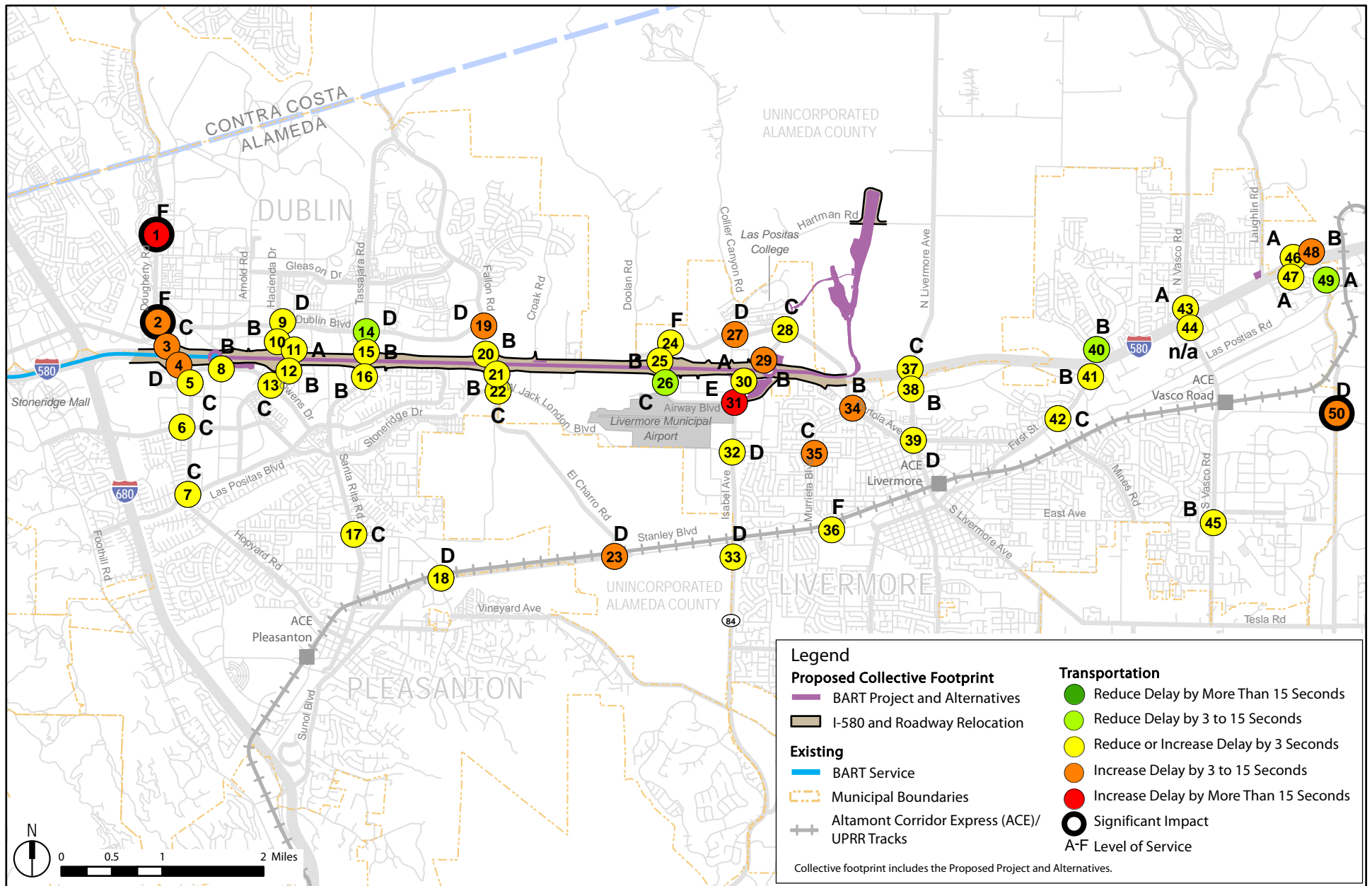
Source: Arup, 2017.

Figure 3.B-35  
 Transportation  
 Intersection LOS and Change in AM Delay  
 2040 Cumulative Conditions, Conventional BART Project



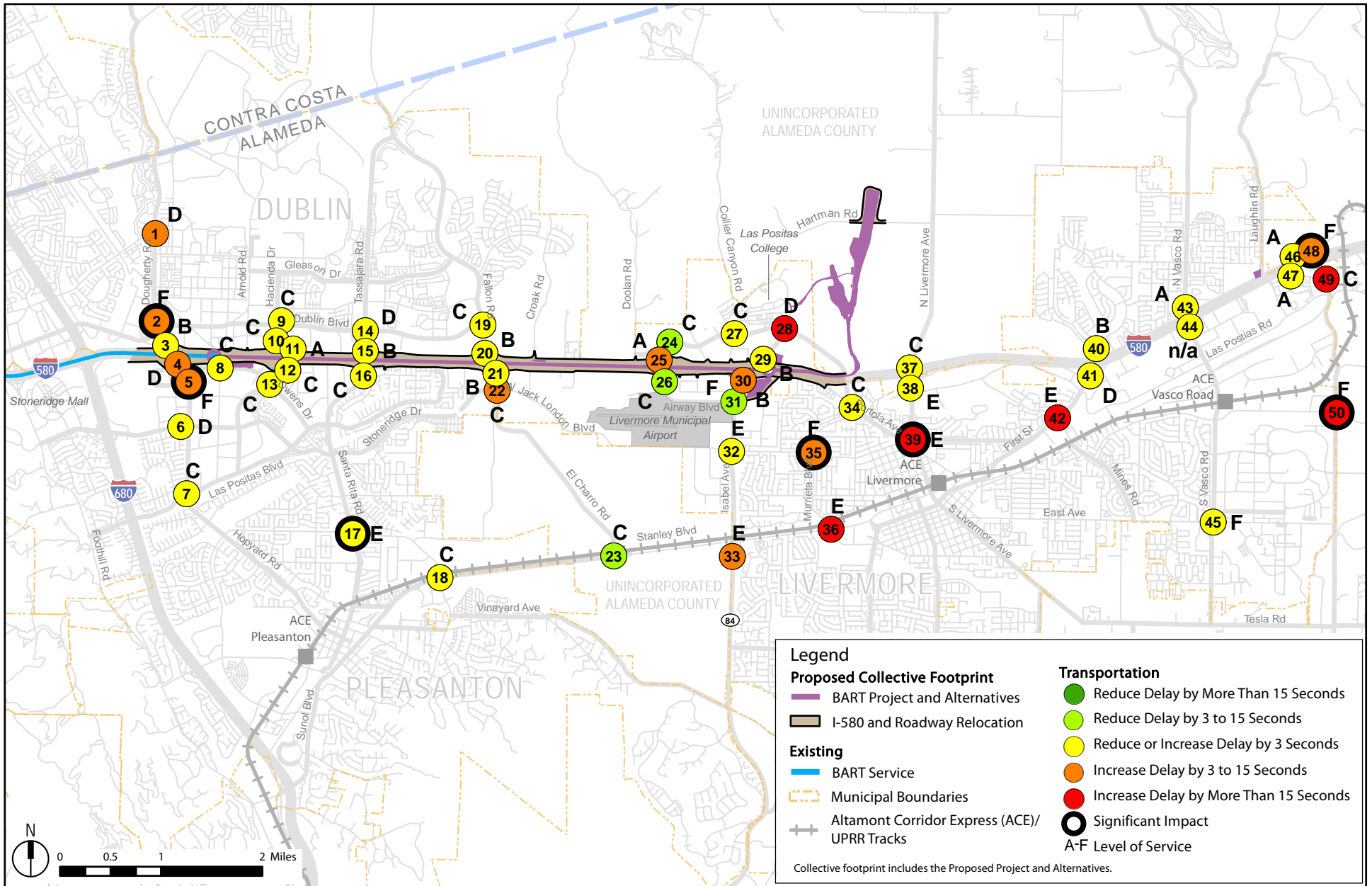
Source: Arup, 2017.

Figure 3.B- 36  
 Transportation  
 Intersection LOS and Change in PM Delay  
 2040 Cumulative Conditions, Conventional BART Project



Source: Arup, 2017.

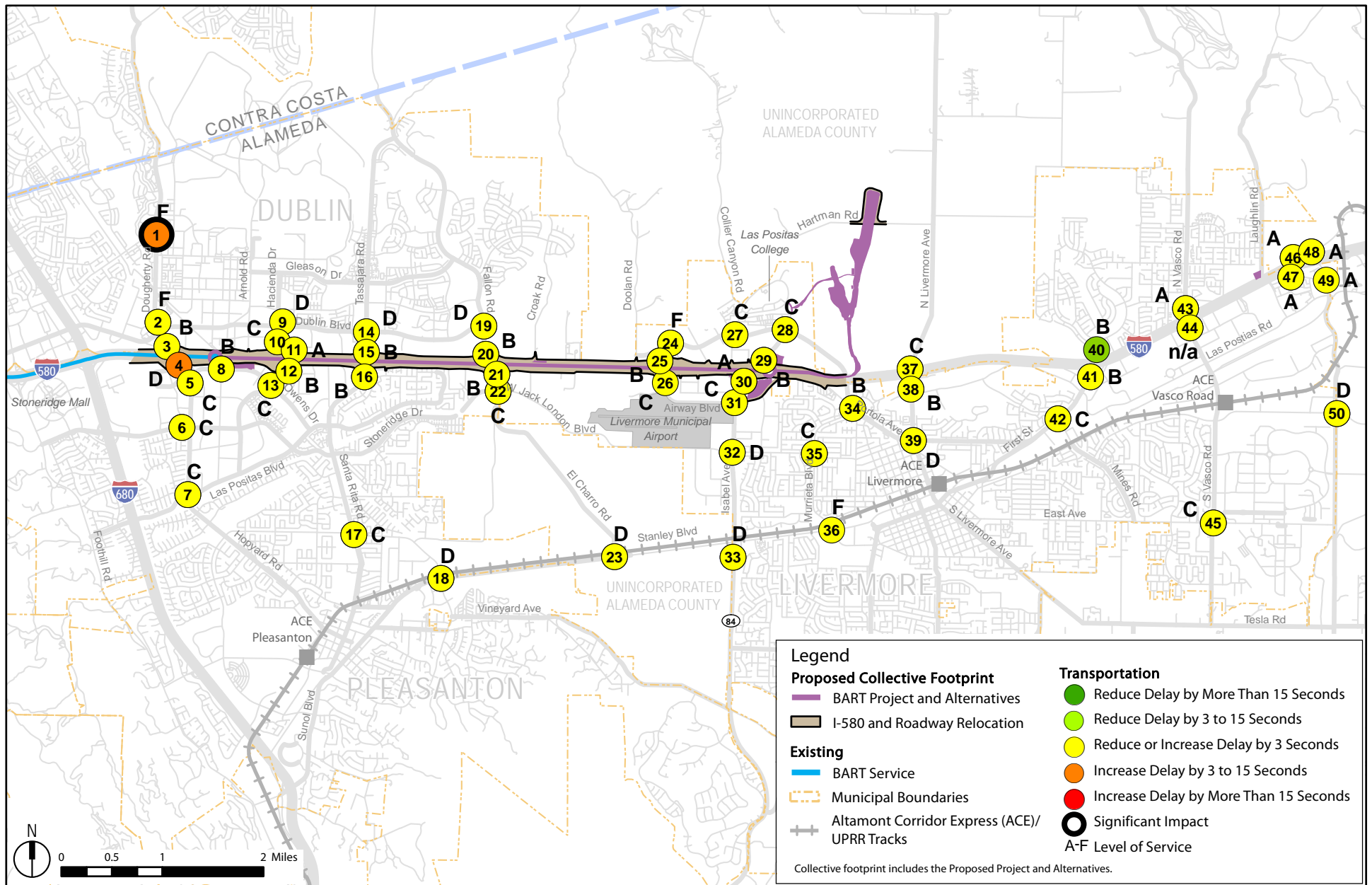
Figure 3.B-37  
 Transportation  
 Intersection LOS and Change in AM Delay  
 2040 Cumulative Conditions, DMU Alternative



Source: Arup, 2017.

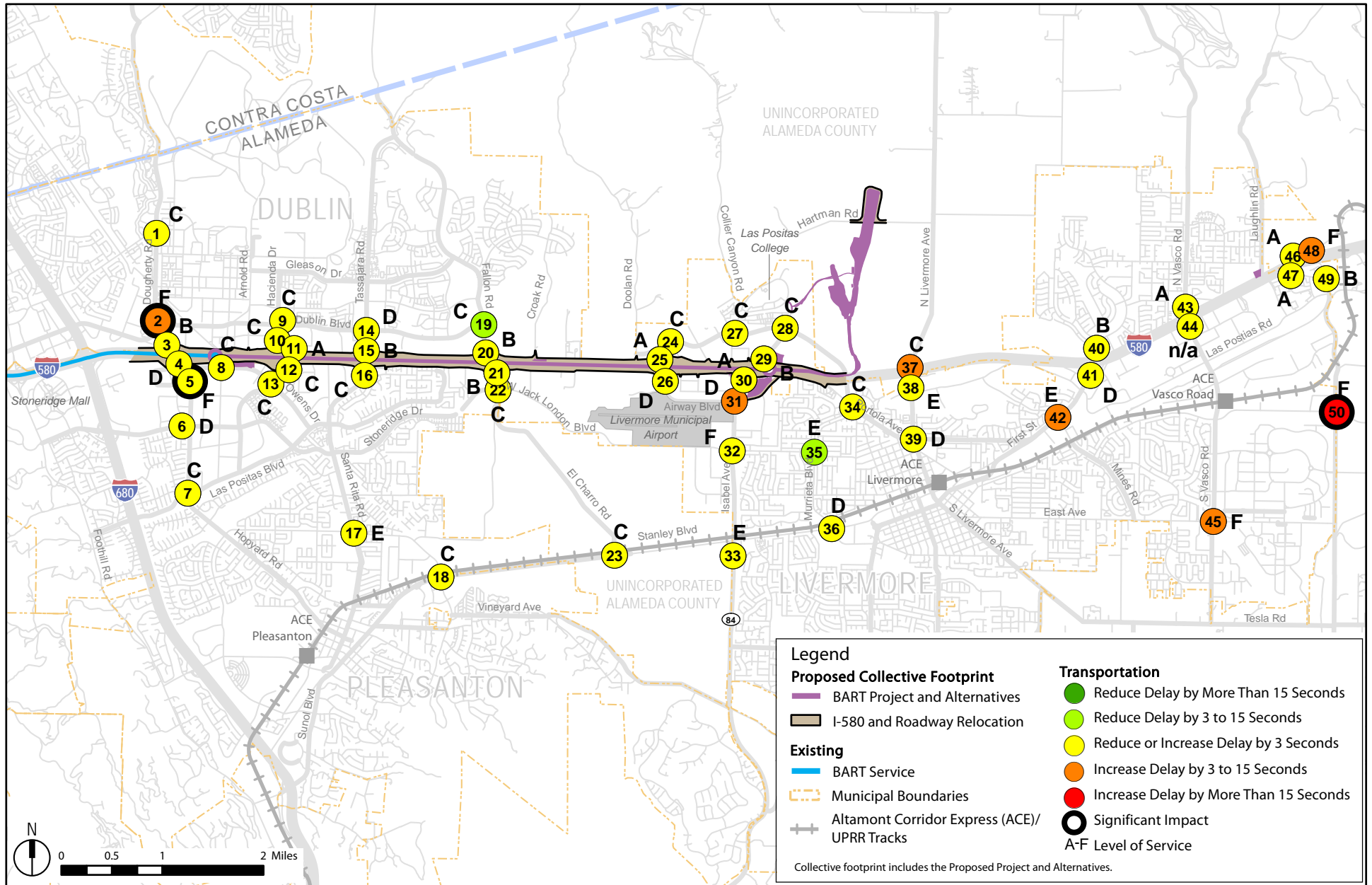
Figure 3.B-38  
 Transportation  
 Intersection LOS and Change in PM Delay  
 2040 Cumulative Conditions, DUM Alternative





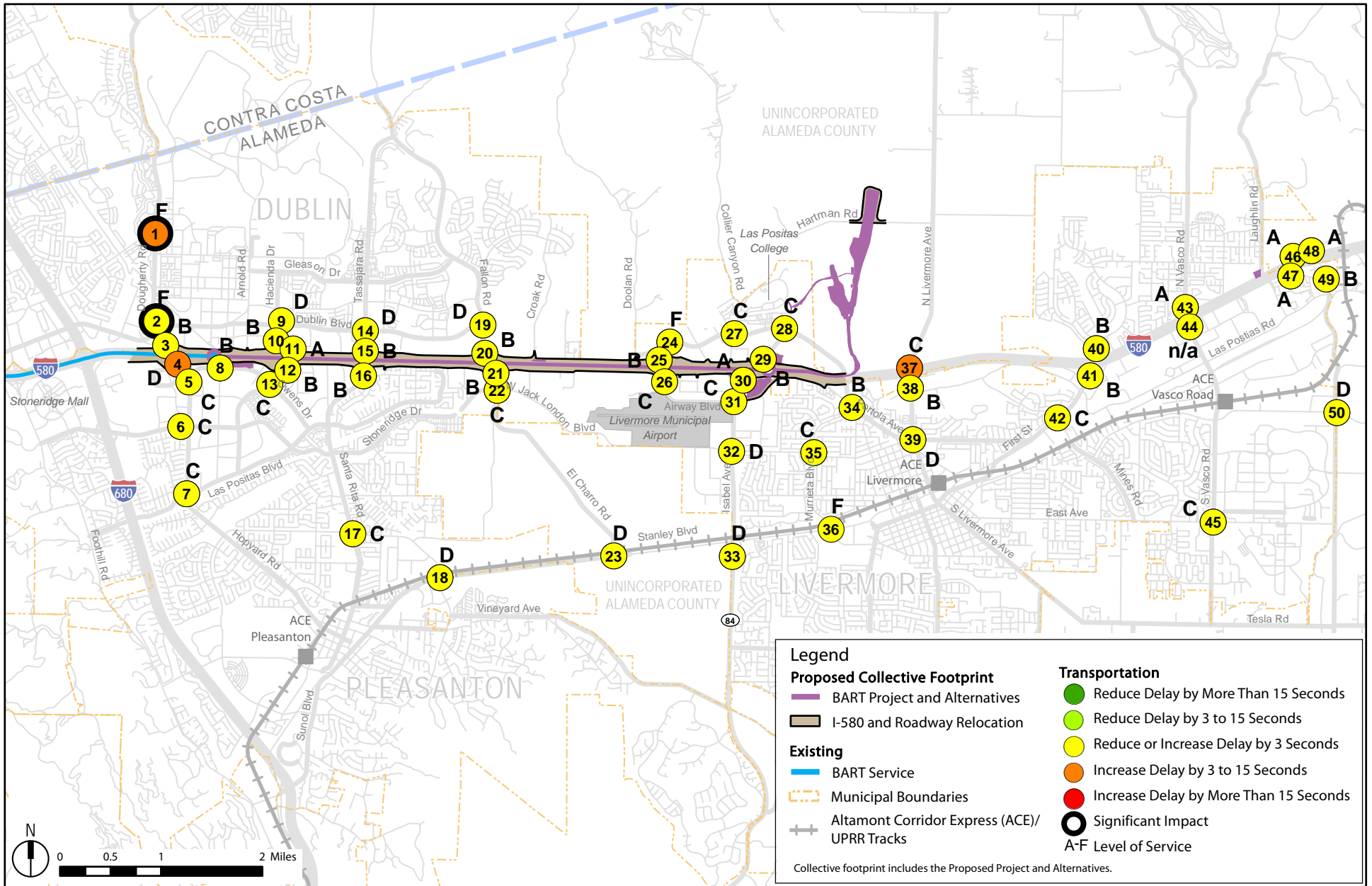
Source: Arup, 2017.

Figure 3.B-39  
 Transportation  
 Intersection LOS and Change in AM Delay  
 2040 Cumulative Conditions, Express Bus/BRT Project



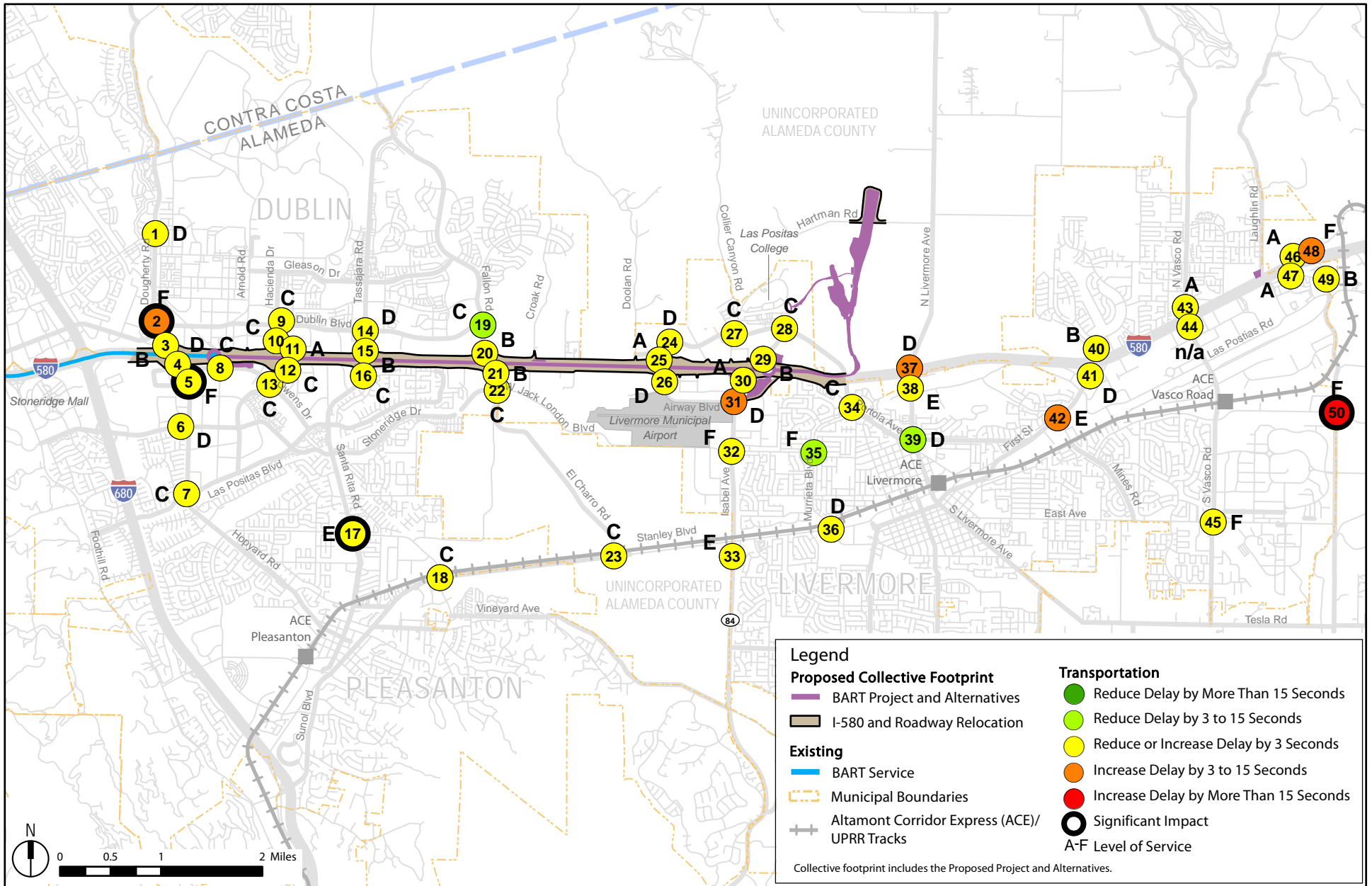
Source: Arup, 2017.

Figure 3.B-40  
 Transportation  
 Intersection LOS and Change in PM Delay  
 2040 Cumulative Conditions, Express Bus/BRT Alternative



Source: Arup, 2017.

Figure 3.B-41  
 Transportation  
 Intersection LOS and Change in AM Delay  
 2040 Cumulative Conditions, Enhanced Bus Alternative



Source: Arup, 2017.

Figure 3.B-42  
 Transportation  
 Intersection LOS and Change in PM Delay  
 2040 Cumulative Conditions, Enhanced Bus Alternative

- **Murrieta Boulevard & Stanley Boulevard (Intersection #36).** Under 2040 Project Conditions, this intersection would operate at an LOS F with a delay of 104.3 seconds in the AM peak period and an LOS D with a delay of 51.2 seconds in the PM peak period. However, this intersection is exempt from the City of Livermore's LOS standard because of environmental constraints, ROW constraints or cut-through traffic volumes or other City of Livermore policies that prevent the implementation of improvements that would achieve the City's LOS standards.
- **First Street & Mines Road (Intersection #42).** Under 2040 Project Conditions, this intersection would operate at an LOS F with a delay of 105.9 seconds in the PM peak period. However, this intersection is exempt from the City of Livermore's LOS standard because of environmental constraints, ROW constraints or cut-through traffic volumes or other City of Livermore policies that prevent the implementation of improvements that would achieve the City's LOS standards.

Significant impacts would occur at the following nine intersections:

- **Dougherty Road & Amador Valley Road (Intersection #1).** Under 2040 Cumulative Conditions, this intersection would operate at an LOS F with a delay of 154.2 seconds in the AM peak period. This intersection also has 360 additional trips under Project Conditions compared to No Project Conditions in the AM peak period, which is greater than the City of Dublin's threshold of 50 additional trips.
- **Hopyard Road/Dougherty Road & Dublin Boulevard (Intersection #2).** Under 2040 Cumulative Conditions, this intersection would operate at an LOS F with a delay of 116.2 seconds in the AM peak period and LOS F with a delay of 177.8 seconds in the PM peak period. This intersection also has 286 additional trips in the AM peak period and 585 additional trips in the PM peak period under Project Conditions compared to No Project Conditions, which is greater than the City of Dublin's threshold of 50 additional trips.
- **Santa Rita Road & Valley Avenue (Intersection #17).** Under 2040 Cumulative Conditions, this intersection would operate at an LOS F with a delay of 81.0 seconds in the PM peak period, which is greater than 45 seconds, the significance threshold identified for this intersection.
- **Murrieta Boulevard & Jack London Boulevard (Intersection #35).** Under 2040 Cumulative Conditions, this intersection would operate at an LOS F with a delay of 129.8 seconds in the PM peak period, which is greater than 45 seconds, the significance threshold identified for this intersection.
- **Livermore Avenue & I-580 EB Ramps (Intersection #38).** Under 2040 Cumulative Conditions, this intersection would operate at an LOS F with a delay of 90.6 seconds in the PM peak period, which is greater than 45 seconds, the significance threshold identified for this intersection.

- **Livermore Avenue & Portola Avenue (Intersection #39).** Under 2040 Cumulative Conditions, this intersection would operate at an LOS D with a delay of 48.3 in the AM peak period and an LOS F with a delay of 88.7 seconds in the PM peak period, which is greater than 45 seconds, the significance threshold identified for this intersection.
- **Vasco Road & East Avenue (Intersection #45).** Under 2040 Cumulative Conditions, this intersection would operate at an LOS F with a delay of 104.4 seconds in the PM peak period, which is greater than 45 seconds, the significance threshold identified for this intersection.
- **Greenville Road & Altamont Pass Road (Intersection #48).** Under 2040 Cumulative Conditions, this intersection would operate at an LOS F with a delay of 118.3 seconds in the PM peak period, which is greater than 45 seconds, the significance threshold identified for this intersection.
- **Greenville Road/Patterson Pass Road (Intersection #50).** Under 2040 Cumulative Conditions, this intersection would operate at an LOS F with a delay of 201.3 seconds in the PM peak period, which is greater than 45 seconds, the significance threshold identified for this intersection.

With the exception of Intersection #39, significant impacts at intersections would be reduced to less than significant with implementation of **Mitigation Measure TRAN-20a**, which requires intersection improvements such as additional turning and through lanes. **Mitigation Measure TRAN-20a** requires the addition of a second northbound left-turn lane at Intersection #39. However, this intersection improvement would not be sufficient to reduce impacts to less than significant at Intersection #39, and further lane additions would be infeasible due to physical constraints. Impacts at Intersection #39 would be significant and unavoidable under 2040 Cumulative Conditions. (SU)

**DMU Alternative.** For the DMU Alternative under 2040 Cumulative Conditions, eleven intersections would experience significant or less-than-significant impacts. Three of these intersections are exempt by policy from applicable LOS standards. One other intersection of the eight remaining significantly impacted intersections also may be exempt, but is treated here as non-exempt until the exemption is confirmed by the relevant jurisdiction.

The policy-exempt intersections are as follows:

- **Isabel Avenue & Airway Boulevard (Intersection #31).** Under 2040 Project Conditions, this intersection would operate at an LOS E with a delay of 63.2 seconds in the AM peak period and an LOS F with a delay of 86.2 seconds in the PM peak period. However, this intersection is designated as exempt from the City of Livermore's LOS standard because this intersection is near a freeway interchange.
- **Murrieta Boulevard & Stanley Boulevard (Intersection #36).** Under 2040 Project Conditions, this intersection would operate at an LOS E with a delay of 62.9 seconds in

the PM peak period. However, this intersection is exempt from the City of Livermore's LOS standard because of environmental constraints, ROW constraints or cut-through traffic volumes or other City of Livermore policies that prevent the implementation of improvements that would achieve the City's LOS standards.

- **First Street & Mines Road (Intersection #42).** Under 2040 Project Conditions, this intersection would operate at an LOS E with a delay of 78.4 seconds in the PM peak period. However, this intersection is exempt from the City of Livermore's LOS standard because of environmental constraints, ROW constraints or cut-through traffic volumes or other City of Livermore policies that prevent the implementation of improvements that would achieve the City's LOS standards.

Significant impacts would occur at the following eight intersections:

- **Dougherty Road & Amador Valley Road (Intersection #1).** Under 2040 Project Conditions, this intersection would operate at an LOS F with a delay of 143.0 seconds in the AM peak period. This intersection also has 284 additional trips under the DMU Alternative compared to No Project Conditions in the AM peak period, which is greater than the City of Dublin's threshold of 50 additional trips.
- **Hopyard Road/Dougherty Road & Dublin Boulevard (Intersection #2).** Under 2040 Project Conditions, this intersection would operate at an LOS F with a delay of 107.5 seconds in the AM peak period and LOS F with a delay of 158.4 seconds in the PM peak period. This intersection also has 197 additional trips in the AM peak period and 351 additional trips in the PM peak period under Project Conditions compared to No Project Conditions, which is greater than the City of Dublin's threshold of 50 additional trips.
- **Hopyard Road & Owens Road (Intersection #5).** Under 2040 Project Conditions, this intersection would operate at an LOS F with a delay of 107.8 seconds in the PM peak period. This intersection also has 92 additional trips under the DMU Alternative compared to No Project Conditions in the PM peak period, which is greater than the City of Pleasanton's threshold of 50 additional trips. However, this intersection is designated a Gateway Intersection and may be exempt from the City of Pleasanton's LOS standard if vehicular capacity improvements would be contrary to other City goals.
- **Santa Rita Road & Valley Avenue (Intersection #17).** Under 2040 Project Conditions, this intersection would operate at an LOS E with a delay of 77.9 seconds in the PM peak period, which is greater than 45 seconds, the significance threshold identified for this intersection.
- **Murrieta Boulevard & Jack London Boulevard (Intersection #35).** Under 2040 Project Conditions, this intersection would operate at an LOS F with a delay of 110.1 seconds in the PM peak period, which is greater than 45 seconds.

- **Livermore Avenue and Portola Avenue (Intersection #39).** Under 2040 Project Conditions, this intersection would operate at an LOS E with a delay of 68.5 seconds in the PM peak period, which is greater than 45 seconds, the significance threshold identified for this intersection.
- **Greenville Road & Altamont Pass Road (Intersection #48).** Under 2040 Project Conditions, this intersection would operate at an LOS F with a delay of 106.6 seconds in the PM peak period, which is greater than 45 seconds, the significance threshold identified for this intersection.
- **Greenville Road/Patterson Pass Road (Intersection #50).** Under 2040 Project Conditions, this intersection would operate at an LOS D with a delay of 49.9 seconds in the AM peak period and an LOS F with a delay of 173.1 seconds in the PM peak period, which is greater than 45 seconds, the significance threshold identified for this intersection.

With the exception of Intersection #5 and Intersection #39, significant impacts at intersections would be reduced to less than significant with implementation of **Mitigation Measure TRAN-20b**, which requires intersection improvements such as additional turning and through lanes. **Mitigation Measure TRAN-20b** requires full eight-phase signal operations at Intersection #5 and the addition of a second northbound left-turn lane at Intersection #39. However, these respective intersection improvements would not be sufficient to reduce impacts to less than significant at Intersection #5 and Intersection #39, and further lane additions would be infeasible due to physical constraints. Impacts at Intersection #5 and Intersection #39 would be significant and unavoidable under 2040 Cumulative Conditions. (SU)

**Express Bus/BRT Alternative.** For the Express Bus/BRT Alternative under 2040 Cumulative Conditions, five intersections would experience significant or less-than-significant impacts. One of these intersections is exempt by policy from applicable LOS standards. Another one of the four remaining intersections with significant impacts may also be exempt by policy from LOS standards, but is treated here as non-exempt until the exemption is confirmed by the relevant jurisdiction.

The policy-exempt intersection is as follows:

- **First Street & Mines Road (Intersection #42).** Under 2040 Project Conditions, this intersection would operate at an LOS E with a delay of 60.0 seconds in the PM peak period. However, this intersection is exempt from the City of Livermore's LOS standard because of environmental constraints, ROW constraints or cut-through traffic volumes or other City of Livermore policies that prevent the implementation of improvements that would achieve the City's LOS standards.



Significant impacts would occur at the following five intersections:

- **Dougherty Road & Amador Valley Road (Intersection #1).** Under 2040 Project Conditions, this intersection would operate at an LOS F with a delay of 103.4 seconds in the AM peak period. This intersection also has 50 additional trips under the Express Bus Alternative compared to No Project Conditions in the AM peak period, which is equal to the City of Dublin's threshold of 50 additional trips.
- **Hopyard Road/Dougherty Road & Dublin Boulevard (Intersection #2).** Under 2040 Project Conditions, this intersection would operate at an LOS F with a delay of 152.5 seconds in the PM peak period. This intersection also has 64 additional trips under the Express Bus Alternative compared to No Project Conditions in the PM peak period, which is greater than the City of Dublin's threshold of 50 additional trips.
- **Hopyard Road & Owens Road (Intersection #5).** Under 2040 Project Conditions, this intersection would operate at an LOS F with a delay of 102.7 seconds in the PM peak period. This intersection also has 92 additional trips under the Express Bus Alternative compared to No Project Conditions in the PM peak period, which is greater than the City of Pleasanton's threshold of 10 additional trips. However, this intersection is designated a Gateway Intersection and may be exempt from the City of Pleasanton's LOS standard if vehicular capacity improvements would be contrary to other City goals.
- **Greenville Road/Patterson Pass Road (Intersection #50).** Under 2040 Project Conditions, this intersection would operate at an LOS F with a delay of 183.4 seconds in the PM peak period, which is greater than 45 seconds, the significance threshold identified for this intersection.

With the exception of Intersection #5, impacts at the intersections above would be reduced to less than significant with implementation of **Mitigation Measure TRAN-20c**, which requires intersection improvements such as additional turning and through lanes. **Mitigation Measure TRAN-20b** requires full eight-phase signal operations at Intersection #5; however, this intersection improvement would not be sufficient to reduce impacts to less than significant at Intersection #5. Further lane additions would be infeasible due to physical constraints at this location; therefore, impacts at Intersection #5 would be significant and unavoidable under 2040 Cumulative Conditions. (SU)

**Enhanced Bus Alternative** For the Enhanced Bus Alternative under 2040 Cumulative Conditions, six intersections would experience significant impacts. One of these intersections is exempt by policy from applicable LOS standards. Another one of the five remaining intersections with significant impacts may be exempt by policy from LOS standards, but is treated here as non-exempt until the exemption is confirmed by the relevant jurisdiction.

The policy-exempt intersection is as follows:

- **First Street & Mines Road (Intersection #42).** Under 2040 Project Conditions, this intersection would operate at an LOS E with a delay of 60.0 seconds in the PM peak period. However, this intersection may be exempt from the City of Livermore's LOS standard because of environmental constraints, ROW constraints or cut-through traffic volumes or other City of Livermore policies that prevent the implementation of improvements that would achieve the City's LOS standards.

Significant impacts would occur at the following five intersections:

- **Dougherty Road & Amador Valley Road (Intersection #1).** Under 2040 Project Conditions, this intersection would operate at an LOS F with a delay of 104.7 seconds in the AM peak period. This intersection also has 59 additional trips under the Enhanced Bus Alternative compared to No Project Conditions in the AM peak period, which is greater than the City of Dublin's threshold of 50 additional trips.
- **Hopyard Road/Dougherty Road & Dublin Boulevard (Intersection #2).** Under 2040 Project Conditions, this intersection would operate at an LOS F with a delay of 101.7 seconds in the AM peak period and LOS F with a delay of 151.4 seconds in the PM peak period. This intersection also has 70 additional trips in the AM peak period and 58 additional trips in the PM peak period under Project Conditions compared to No Project Conditions, which is greater than the City of Dublin's threshold of 50 additional trips.
- **Hopyard Road & Owens Road (Intersection #5).** Under 2040 Project Conditions, this intersection would operate at an LOS F with a delay of 102.7 seconds in the PM peak period. This intersection also has 29 additional trips under the Enhanced Bus Alternative compared to No Project Conditions in the PM peak period, which is greater than the City of Pleasanton's threshold of 10 additional trips. However, this intersection is designated a Gateway Intersection and may be exempt from the City of Pleasanton's LOS standard if vehicular capacity improvements would be contrary to other City goals.
- **Santa Rita Road & Valley Avenue (Intersection #17).** Under 2040 Project Conditions, this intersection would operate at an LOS E with a delay of 79.9 seconds in the PM peak period, which is greater than 45 seconds, the significance threshold identified for this intersection.
- **Greenville Road/Patterson Pass Road (Intersection #50).** Under 2040 Project Conditions, this intersection would operate at an LOS F with a delay of 177.2 seconds in the PM peak period, which is greater than 45 seconds, the significance threshold identified for this intersection.

Impacts at all intersections except Intersection #5 would be reduced to less than significant with implementation of **Mitigation Measure TRAN-20d**, which requires intersection improvements such as additional turning and through lanes. **Mitigation Measure TRAN-20b** requires full eight-phase signal operations at Intersection #5; however, this intersection improvement would not be sufficient to reduce impacts to less than significant at Intersection #5. Further lane additions would be infeasible due to physical constraints at this location; therefore, impacts at Intersection #5 and would be significant and unavoidable under 2040 Cumulative Conditions. (SU)

**Mitigation Measures.** As described above, the Proposed Project and Alternatives would have potentially significant cumulative impacts to intersections under 2040 Cumulative Conditions. **Mitigation Measure TRAN-20a**, **Mitigation Measure TRAN-20b**, **Mitigation Measure TRAN-20c**, and **Mitigation Measure TRAN-20d** would require BART to participate and coordinate with local jurisdictions in implementing intersection improvements and contribute funding. With implementation of these mitigation measures, potential impacts would be reduced to a less-than-significant level. Impacts associated with the Proposed Project and the DMU Alternative at Intersection #39 would be significant and unavoidable. Impacts associated with the DMU Alternative, Express Bus/BRT Alternative, and the Enhanced Bus Alternative at Intersection #5 would be significant and unavoidable. Additional mitigation is infeasible due to physical constraints at these intersections that prevent the addition of new turning lanes or through lanes.

**Mitigation Measure TRAN-20a: Improvements for Intersections #1, #2, #17, #35, #38, #39, #45, #48, and #50 under 2040 Cumulative Conditions (Conventional BART Project)**

BART shall coordinate with local jurisdictions to implement and contribute its fair share toward funding the following improvements at the following intersections:

- Dougherty Road & Amador Valley Road (Intersection #1) – Add an eastbound right-turn overlap phase.
- Dougherty Road & Dublin Boulevard (Intersection #2) – Add a third southbound left-turn lane and a second westbound right-turn lane.
- Santa Rita Road & Valley Avenue (Intersection #17) – Add a third southbound left-turn lane.
- Murrieta Boulevard & Jack London Boulevard (Intersection #35) – Add an eastbound right-turn overlap phase.
- Livermore Avenue & I-580 EB Ramps (Intersection #38) – Add dedicated northbound right-turn lane.
- Livermore Avenue & Portola Avenue (Intersection #39) – Add a second northbound left-turn lane.

- Vasco Road & East Avenue (Intersection #45) – Operate eastbound and westbound phases as split phases. Reconfigure eastbound lanes to include one left-turn lane, one shared left-turn/through lane, and one shared through/right-turn lane.
- Greenville Road & WB I-580 Ramps (Intersection #48) – Add a second eastbound through lane.
- Greenville Road & Patterson Pass Road (Intersection #50) – Add a second eastbound through lane and a dedicated eastbound right-turn lane.

**Mitigation Measure TRAN-20b: Improvements for Intersections #1, #2, #5, #17, #35, #39, #48, and #50 under 2040 Cumulative Conditions (DMU Alternative/EMU Option)**

BART shall coordinate with local jurisdictions to implement and contribute its fair share toward funding the following improvements at the following intersections:

- Dougherty Road & Amador Valley Road (Intersection #1) – Add an eastbound right-turn overlap phase.
- Dougherty Road & Dublin Boulevard (Intersection #2) – Add a third southbound left-turn lane and a second westbound right-turn lane.
- Hopyard Road & Owens Road (Intersection #5) – Create a full eight-phase signal operation. Alternatively, if this intersection is confirmed to be exempt from the City of Pleasanton’s LOS standard following consultation with the City, no mitigation is required.
- Santa Rita Road & Valley Avenue (Intersection #17) – Add a third southbound left-turn lane.
- Murrieta Boulevard & Jack London Boulevard (Intersection #35) – Add an eastbound right-turn overlap phase.
- Livermore Avenue & Portola Avenue (Intersection #39) – Add a second northbound left-turn lane.
- Greenville Road & WB I-580 Ramps (Intersection #48) – Add a second eastbound through lane.
- Greenville Road & Patterson Pass Road (Intersection #50) – Add a second eastbound through lane and a dedicated eastbound right-turn lane.

**Mitigation Measure TRAN-20c: Improvements for Intersections #1, #2, #5, and #50 under 2040 Cumulative Conditions (Express Bus/BRT Alternative)**

BART shall coordinate with local jurisdictions to implement and contribute its fair share toward funding the following improvements at the following intersections:

- Dougherty Road & Amador Valley Road (Intersection #1) – Add an eastbound right-turn overlap phase.
- Dougherty Road & Dublin Boulevard (Intersection #2) – Add a third southbound left-turn lane and a second westbound right-turn lane.
- Hopyard Road & Owens Road (Intersection #5) – Create a full eight-phase signal operation. Alternatively, if this intersection is confirmed to be exempt from the City of Pleasanton’s LOS standard following consultation with the City, no mitigation is required.
- Greenville Road & Patterson Pass Road (Intersection #50) – Add a second eastbound through lane and a dedicated eastbound right-turn lane.

**Mitigation Measure TRAN-20d: Improvements for Intersections #1, #2, #5, #17, and #50 under 2040 Cumulative Conditions (Enhanced Bus Alternative)**

BART shall coordinate with local jurisdictions to implement and contribute its fair share toward funding the following improvements at the following intersections:

- Dougherty Road & Amador Valley Road (Intersection #1) – Add an eastbound right-turn overlap phase.
- Dougherty Road & Dublin Boulevard (Intersection #2) – Add a third southbound left-turn lane and a second westbound right-turn lane.
- Hopyard Road & Owens Road (Intersection #5) – Create a full eight-phase signal operation. Alternatively, if this intersection is confirmed to be exempt from the City of Pleasanton’s LOS standard following consultation with the City, no mitigation is required.
- Santa Rita Road & Valley Avenue (Intersection #17) – Add a third southbound left-turn lane.
- Greenville Road & Patterson Pass Road (Intersection #50) – Add a second eastbound through lane and a dedicated eastbound right-turn lane.

## Transit

***Impact TRAN-21(CU): Impede the ability to improve transit access to BART, improve surrounding transit system inefficiencies, or improve ridership on surrounding transit services, under 2025 or 2040 Cumulative Conditions.***

***(No Project Alternative: NI; Conventional BART Project: LS; DMU Alternative: LS; Express Bus/BRT Alternative: LS; Enhanced Bus Alternative: NI)***

Transit access to BART and the ability of surrounding transit services to reduce system inefficiencies for the Proposed Project and Build Alternatives under Cumulative Conditions

would be similar to that under Project Conditions (similar or better than No Project Conditions).

Table 3.B-70 below presents the daily ridership projections under 2025 Cumulative Conditions for surrounding transit services; ACE ridership is expected to drop under the Proposed Project and DMU Alternative. Once BART is extended to Santa Clara County, some ACE riders traveling to southern Alameda County and Santa Clara County may prefer to ride BART but may be unable to find parking at the Dublin/Pleasanton Station. However, under the Proposed Project and DMU Alternative, these riders would switch from ACE to BART due to the available parking spaces at Isabel Station.

The ridership projects do not include a BART-ACE rail connection. ACE ridership could increase if any of the BART-ACE rail connection alternatives considered in the ACEforward Draft EIR analysis are implemented.

**TABLE 3.B-70 SURROUNDING TRANSIT SERVICES RIDERSHIP (WEEKDAY), 2025 CUMULATIVE CONDITIONS**

<b>Systemwide Boardings (Change from No Project)</b>				
	<b>Conventional BART Project</b>	<b>DMU Alternative</b>	<b>Express Bus/BRT Alternative</b>	<b>Enhanced Bus Alternative</b>
ACE	4,600 (-1000)	4,700 (-900)	5,400 (-200)	5,600 (0)
LAVTA	10,800 (+400)	11,200 (+800)	11,600 (+1,200)	10,100 (-300)
RTD	30 (-330)	70 (-290)	80 (-280)	360 (0)

Notes: ACE = Altamont Corridor Express; LAVTA = Livermore-Amador Valley Transit Authority; RTD = San Joaquin Regional Transit District.

ACE ridership numbers only include boardings in San Joaquin County and the Bay Area. These numbers do not reflect boarding along potential future ACE extensions into Stanislaus and Merced Counties.

Source: Cambridge Systematics, 2017.

For a similar reason, RTD ridership would also drop under multiple BART Livermore Extension Build Alternatives. LAVTA ridership is expected to increase under the rail alternatives, as extended BART service increases the appeal of connecting bus service. LAVTA ridership is expected to increase the most under the Express Bus/BRT Alternative—the assumed LAVTA bus routes using the median bus/HOT lanes would attract some of the riders that would have taken the extended rail service.

Table 3.B-71 below presents the daily ridership projections under 2040 Cumulative Conditions for surrounding transit services. Similar to 2025 Project Conditions, ACE and RTD ridership would decrease, a result of BART extended service competing with those

services, and LAVTA ridership is expected to increase under the rail alternatives, as the extended service increases the attractiveness of connecting bus service.

**TABLE 3.B-71 SURROUNDING TRANSIT SERVICES RIDERSHIP SYSTEMWIDE BOARDINGS (WEEKDAY), 2040 CUMULATIVE CONDITIONS**

	Change from No Project			
	Conventional BART Project	DMU Alternative	Express Bus/BRT Alternative	Enhanced Bus Alternative
ACE	4,600 (-2,300)	4,700 (-2,200)	5,400 (-1,200)	5,600 (-1,000)
LAVTA	10,800 (400)	11,200 (-3,500)	11,600 (-3,100)	10,100 (-4,600)
RTD	30 (-310)	70 (-270)	80 (-260)	360 (20)

Notes: ACE = Altamont Corridor Express; LAVTA = Livermore-Amador Valley Transit Authority; RTD = San Joaquin Regional Transit District.

ACE ridership numbers only include boardings in San Joaquin County and the Bay Area. These numbers do not reflect boarding along potential future ACE extensions into Stanislaus and Merced Counties.

Source: Cambridge Systematics, 2017.

**No Project Alternative.** As described in **Impact TRAN-9** above, the No Project Alternative would have no impacts related to transit access to BART, surrounding transit system inefficiencies, or ridership on surrounding transit services during operation. Therefore, the No Project Alternative would not contribute to cumulative impacts. **(NI)**

**Conventional BART Project.** For the Proposed Project under 2025 and 2040 Cumulative Conditions, the modified routes operated by LAVTA would experience higher ridership as a result of the improved BART and local transit service coverage. However, ACE and the RTD bus route serving the area would experience a decrease in ridership. ACE ridership could increase if any of the BART-ACE rail connection alternatives considered in the ACEforward Draft EIR analysis are implemented. Because the cumulative changes in ridership are small compared to overall ridership for these transit services, the cumulative impact to these transit services is not expected to be significant. Therefore, the Proposed Project would have a less-than-significant impact related to surrounding transit service ridership under 2025 and 2040 Cumulative Conditions, and no mitigation measures are required. **(LS)**

**DMU Alternative.** The DMU Alternative’s impact under 2025 and 2040 Cumulative Conditions on other area transit routes is very similar to that of the Proposed Project. The modified routes operated by LAVTA would experience higher ridership as a result of the improved BART and local transit service coverage under the Proposed Project. ACE and the RTD bus route serving the area would experience a decrease in ridership. ACE ridership could increase

if any of the BART-ACE rail connection alternatives considered in the ACEforward Draft EIR analysis are implemented. Because the cumulative changes in ridership are small compared to overall ridership for these transit services, the cumulative impact to these transit services is not expected to be significant. Overall, the DMU Alternative would have a less-than-significant impact related to surrounding transit service ridership under 2025 and 2040 Cumulative Conditions, and no mitigation measures are required. **(LS)**

**Express Bus/BRT Alternative.** For the Express Bus/BRT Alternative under 2025 and 2040 Cumulative Conditions, LAVTA routes would experience increased ridership, with the assumed R-B and X-B routes seeing higher ridership due to their high frequency and direct service to the Dublin/Pleasanton Station. However, RTD would see lower ridership. Because the cumulative changes in ridership are small compared to overall ridership for these transit services, the cumulative impact to these transit services is not expected to be significant. Therefore, the Express Bus/BRT Alternative would have a less-than-significant impact related to surrounding transit service ridership under 2025 and 2040 Cumulative Conditions, and no mitigation measures are required. **(LS)**

**Enhanced Bus Alternative.** For the Enhanced Bus Alternative under 2025 and 2040 Cumulative Conditions, other area transit services would experience the same or higher ridership as a result of the improved transit service coverage under the Enhanced Bus Alternative. Therefore, the Enhanced Bus Alternative would have no impacts related to surrounding transit service ridership under 2025 and 2040 Cumulative Conditions, and no mitigation measures are required. **(NI)**

**Mitigation Measures.** As described above, the Proposed Project and Alternatives, in combination with past, present, or probable future projects, would not result in significant cumulative impacts related to the surrounding transit service ridership under 2025 and 2040 Cumulative Conditions, and no mitigation measures are required.

## **Bicycles**

***Impact TRAN-22(CU): Worsen bicycle level of traffic stress, circulation and access, or safety hazards, under 2025 or 2040 Cumulative Conditions.***

***(No Project Alternative: NI; Conventional BART Project: B; DMU Alternative: B; Express Bus/BRT Alternative: NI; Enhanced Bus Alternative: NI)***

**No Project Alternative.** As described in **Impact TRAN-10** above, the No Project Alternative would have no impacts related to bicycle LTS, circulation and access, or safety hazards during operation. Therefore, the No Project Alternative would not contribute to cumulative impacts. **(NI)**



**Conventional BART Project.** Bicycle LTS for the Proposed Project under Cumulative Conditions is shown in Figure 3.B-43.

The Proposed Project would, under Cumulative Conditions, provide improved LTS compared with No Project Conditions. The improvement would result from the INP's new street network that would provide new routes with low LTS, as well as additional bicycle and pedestrian crossings of barriers and key locations such as Isabel Avenue and I-580. Therefore, the Proposed Project would have no negative impacts on bicycle LTS.

With the INP calling for increased development and bicycle-supportive street design, and the proposed Las Positas Trail, bicycle access to the proposed Isabel Station would improve under the Proposed Project.

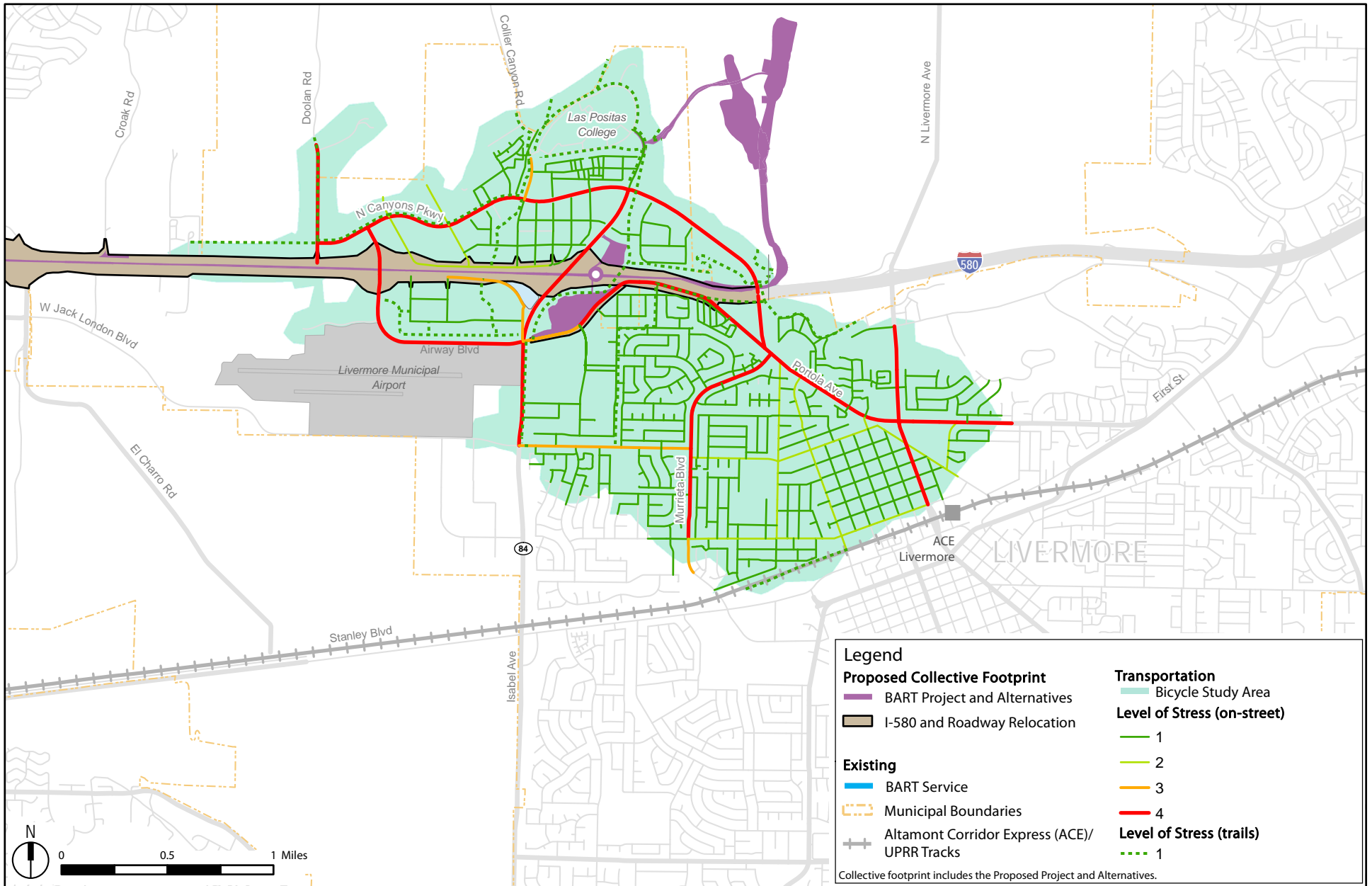
The Proposed Project under Cumulative Conditions would have similar less-than-significant impacts to bicycle safety hazards as described under Project Conditions. Therefore, the Proposed Project would have a beneficial impact related to bicycle LTS, circulation and access, and safety hazards under 2025 and 2040 Cumulative Conditions, and no mitigation measures are required. **(B)**

**DMU Alternative.** The DMU Alternative would be similar to the Proposed Project, because this alternative would be accompanied by the same INP improvements. Therefore, the DMU Alternative's impact to bicycle LTS, circulation and access, and safety hazards under 2025 and 2040 Cumulative Conditions would be beneficial, similar to the Proposed Project, and no mitigation measures are required. **(B)**

**Express Bus/BRT Alternative.** The Express Bus/BRT Alternative under Cumulative Conditions would not make any changes to the bicycle study area, and therefore would have no impact on bicycle LTS, circulation and access, or safety hazards in the area. Therefore, the Express Bus/BRT Alternative would have no impacts related to bicycle LTS, circulation and access, and safety hazards under 2025 and 2040 Cumulative Conditions, and no mitigation measures are required. **(NI)**

**Enhanced Bus Alternative.** The Enhanced Bus Alternative under Cumulative No Project Conditions would not make any changes to the bicycle study area. Therefore, the Enhanced Bus Alternative would have no impacts related to bicycle LTS, circulation and access, and safety hazards under 2025 and 2040 Cumulative Conditions, and no mitigation measures are required. **(NI)**

**Mitigation Measures.** As described above, the Proposed Project and Alternatives, in combination with past, present, or probable future projects, would not result in significant cumulative impacts related to bicycle LTS, circulation and access, or safety under 2025 or 2040 Cumulative Conditions, and no mitigation measures are required.



Source: Arup, 2017.

Figure 3.B- 43  
 Transportation  
 Bicycle Level of Stress

2025 and 2040 Cumulative Conditions, Conventional BART Project and DMU Alternative

## Pedestrians

***Impact TRAN-23(CU): Worsen pedestrian crossing distance or delay, circulation and access, or safety hazards, under 2025 or 2040 Cumulative Conditions.***

***(No Project Alternative: NI; Conventional BART Project: NI; DMU Alternative: NI; Express Bus/BRT Alternative: NI; Enhanced Bus Alternative: NI)***

Around the proposed Isabel Station, the City of Livermore is planning for the INP. The new area would feature a mix of development from office and retail to residential development, and would promote pedestrian movement. Many of the streets would be enhanced with pedestrian-oriented features that contribute to the identity and character of the Isabel neighborhood. There would be an emphasis on wide sidewalks, buildings close to the street with doors and windows facing the street, and landscaped walkways and stoops on street frontages to promote walking. This walkable neighborhood would be connected to the new Isabel Station through a pedestrian/bike overcrossing of I-580.

**No Project Alternative.** As described in **Impact TRAN-11** above, the No Project Alternative would have no impacts related to pedestrian crossing distance or delay, circulation and access, or safety hazards during operation. Therefore, the No Project Alternative would not contribute to cumulative impacts. **(NI)**

**Conventional BART Project and Build Alternative.** As described in **Impact TRAN-11** above, the Proposed Project and Build Alternatives would have no impact to pedestrian crossing distance or delay, circulation and access, or safety hazards during operation. Therefore, the Proposed Project and Build Alternatives would not contribute to cumulative impacts. **(NI)**

**Mitigation Measures.** As described above, the Proposed Project and Alternatives, in combination with past, present, or probable future projects, would not result in significant cumulative impacts related to pedestrian crossing distance, circulation and access, or safety under 2025 or 2040 Cumulative Conditions, and no mitigation measures are required.

