



Alameda I-680

Comprehensive Multimodal Corridor Plan



Alameda I-680 Comprehensive Multimodal Corridor Plan

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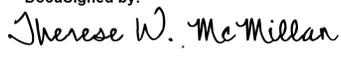
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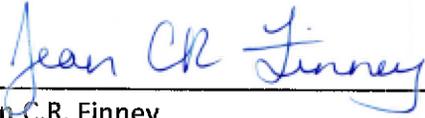


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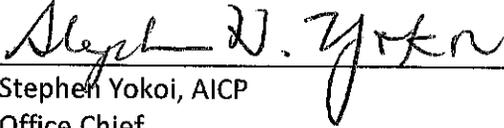
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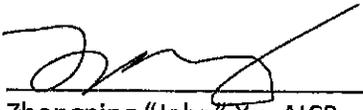
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Executive Summary

The Alameda Interstate (I-) 680 Comprehensive Multimodal Corridor Plan (CMCP) presents a holistic approach for managing congestion, improving safety and maximizing flow for all modes and incorporates measures to reduce air pollution and greenhouse gases. Key strategies include the addition of managed/express lanes to maximize the efficient use of the existing highway for motorists, the development of express bus services, rail and local transit improvements and improved bicycle/pedestrian facilities.

The CMCP was developed pursuant to the statutory mandate for Caltrans to conduct long-range corridor planning, as well as in response to the Road and Repair Accountability Act of 2017, also known as Senate Bill 1 (SB 1), that was passed in April 2017. Among the multiple programs established by SB 1 is the Solutions for Congested Corridors Program (SCCP). This program provides \$250 million annually on a competitive basis to Caltrans and regional agencies for projects designed to achieve a balanced set of transportation, environmental, and community access improvements within highly- congested travel corridors throughout the State. Eligible projects should make specific performance improvements and must be included in a Comprehensive Multimodal Corridor Plan.

For the purpose of this CMCP, the I-680 Corridor is defined as starting at SR 237 in Santa Clara County and ending at the border of Alameda County and Contra Costa County. However, because I-680 is a major south-north connection between Silicon Valley in the South Bay and eastern Alameda County and central Contra Costa County in the East Bay as well as Solano County in the North Bay, serving local, regional, and interregional traffic of people and goods, factors that may affect corridor performance and travel patterns (such as demographics and trip generators) are considered for all four counties. The southern portion of the Corridor parallels I-880 that connects Oakland to Silicon Valley. Major parallel arterials are found along portions of the Corridor. Several transit agencies provide services within or near the Corridor, while multi-use paths and trails are available also within the unincorporated areas.

The I-680 Corridor is one of the main connections between workers living in Alameda and Contra Costa Counties and Silicon Valley, home to some of the world’s most innovative high-tech industries and fastest-growing companies that significantly contribute to the State and national economies. The Corridor also serves as an important freight connection for the movement of agricultural products from the Central Valley and from wineries in the Livermore Valley via I-580. As a result, I-680 is experiencing significant traffic congestion during peak periods. Five locations on I-680 across the three counties were listed in the Top 50 Congested Locations of 2017 as reported by Metropolitan Transportation Commission’s (MTC) Vital Signs, as shown in **Table ES-1**.

Table ES-1. MTC Top 50 Congested Locations for I-680 in 2017

Rank	County	Direction	Daily Delay in hours	Congestion Duration	Location
4	Alameda	I-680 NB	6,280	1:55 PM – 8:20 PM	Scott Creek Road to Andrade Road
10	Contra Costa	I-680 NB	4,500	2:40 PM–7:10 PM	Sycamore Valley Rd to Buskirk Ave/Oak Park
17	Santa Clara	I-680 SB/ I-280 EB	3,460	6:35 AM–10:20 AM	Capitol Expressway to Foothill Expressway
27	Santa Clara	I-680 SB	1,720	3:25 PM–7:00 PM	SR 237 to Berryessa Road
28	Contra Costa	I-680 SB	1,720	6:00 AM–9:30 AM	Gregory Lane/Monument to N Main Street

The CMCP has five Corridor Goals:

1. Accessible, Affordable and Equitable
2. Safe, Healthy and Sustainable
3. High Quality and Modern Infrastructure
4. Economic Vitality
5. Accommodate Current and Future Traffic Demand

These five Goals guide the establishment of Corridor Objectives and Performance Measures, which evaluate the effectiveness of recommended strategies.

In addition to demographics and a list of major trip generators along the Corridor, the I-680 CMCP includes a place-type analysis based on Caltrans Smart Mobility Framework and recommends appropriate transportation strategies for each place-type within the Corridor. The CMCP documents regional development framework established in Plan Bay Area 2040 (2017), which is the San Francisco Bay Area's Regional Transportation Plan (RTP) and Sustainable Communities Strategy (SCS), as well as proposed future development framework to be considered in the current RTP update. Communities of Concern and areas with air pollution burdens within the Corridor are also identified.

To capture the multimodal nature of the I-680 Corridor, the CMCP describes public transit services and supporting Park-and-Ride facilities, private commuter shuttle services, and bicycle and pedestrian facilities as critical transportation modes within the Corridor. In addition, it summarizes the Transportation Systems Management and Operations (TSMO) strategies and equipment that are currently deployed within the Corridor and examines the networks and major trip generators for freight movement.

Due to time and resource constraints, this CMCP utilizes a "hybrid" approach as described in the California Transportation Commission's (CTC) 2018 Comprehensive Multimodal Corridor Plan Guidelines. As such, the CMCP involves an integration of existing plans, studies and project-specific information with limited new analysis. Some examples of the existing plans being integrated include MTC's Plan Bay Area 2040, Caltrans District 4 Bike Plan, Alameda County Transportation Commission's Countywide Transportation Plan and Modal Plans, as well as local development plans and studies.

For freeway performance analysis for both existing conditions and projected future conditions, information was mostly derived from the existing project reports and studies within the Corridor. The analysis mainly focuses on bottleneck locations, congestion characteristics and changes in the network performance measures such as travel time, vehicle hours of delay and person hours of delay as a result of implementing managed lanes projects.

The recommended strategies include highway, transit, Park-and-Ride and active transportation projects as well as maintenance and operational projects in the State Highway Operation and Safety Program (SHOPP) and the 10-Year SHOPP Project Book. Included in this multimodal package of improvement strategies, among others, are projects to close the gaps in the managed lane network on I-680. A long-distance, frequent express bus service is also proposed to take advantage of this to-be-completed managed lane network. These strategies will help further enhance the multimodal nature of the Corridor. Chapter 7 also includes a qualitative evaluation of non-SHOPP projects, with respect to how they would contribute to the corridor goals. **Table ES-2** and **Table ES-3** list recommended highway, transit and Park-and-Ride projects and active transportation projects, respectively.

Table ES-2. I-680 Corridor Future Highway, Transit, and Park-and-Ride Projects
(not in priority order)

#	Project Type	Co.	Title	Description	Cost Estimate (\$M)*	Short-Term** (0-4 Years)	Medium-Term (4-10 Years)	Long-Term (10+ Years)	RTP ID/ Source
Projects in Alameda County									
1	Interchange	ALA	I-580/I-680 Interchange	Improve capacity, operations and safety at the interchange, primarily in the westbound direction approaching the interchange. This project includes the Phase 1 short-term operational improvements.	\$1,500			X	17-01-0028
2	Interchange	ALA	I-680 Overcrossing Widening and Improvements	Widen Stoneridge Drive overcrossing at I-680 constructing third westbound lane.	\$19	X			17-01-0042
3	Interchange	ALA	I-680 Sunol Interchange Modification	Signalize Sunol at I-680 Interchange ramps and widen Southbound on ramp.	\$15	X			17-01-0044
4	Interchange	ALA	SR 84/I-680 Interchange Improvements and SR 84 Widening	Construct interchange improvements for the Route 84/I-680 Interchange, widen Route 84 from Pigeon Pass to I-680 and construct aux lanes on I-680 between Andrade and Route 84. (Currently in Design.)	\$244	X			17-01-0029
5	Interchange	ALA	Auto Mall Parkway Improvements	Enhance capacity and operations of Auto Mall Parkway from Fremont Blvd to I-680, including freeway interchange upgrades and bike/ped facilities, with potential widening from four to six lanes and grade separation at Auto Mall/Osgood.	\$50		X		17-01-0052
6	Managed Lanes	ALA	I-680 Express Lanes Phase II: Northbound from SCL County Line to Auto Mall Parkway	Express lanes on I-680 in the northbound direction from Auto Mall Parkway to County Line.	\$130			X	17-10-0058

#	Project Type	Co.	Title	Description	Cost Estimate (\$M)*	Short-Term** (0-4 Years)	Medium-Term (4-10 Years)	Long-Term (10+ Years)	RTP ID/ Source
7	Managed Lanes	ALA	I-680 Express Lanes from SR 84 to Alcosta Blvd Phase 1: SB Express Lane	The SB I-680 Express Lanes from SR 84 to Alcosta Boulevard Project will close the gap between existing and in-progress High Occupancy Vehicle (HOV)/express lane projects directly to the north and south. This project is intended to include a Caltrans project that would repave the general purpose lanes along this segment for \$95 million.	\$350	X			17-10-0062
8	Managed Lanes	ALA	I-680 Express Lanes from SR 84 to Alcosta Blvd Phase 2: NB Express Lane	The NB I-680 Express Lanes from SR 84 to Alcosta Boulevard Project will close the gap between existing and in-progress High Occupancy Vehicle (HOV)/express lane projects directly to the north and south.	\$225		X		17-10-0062
9	Managed Lanes	ALA	SR 262 Mission Boulevard Cross Connector Improvements	Increase mobility between I-680 and I-880 by widening Mission Blvd. to three lanes, an express lane in each direction throughout the I-680 Interchange, rebuild the NB and SB 680 on and off-ramps, and potentially grade separate Mission Blvd. from Mohave Dr. to Warm Springs Blvd.	\$1,000		X		17-01-0020
10	Express Bus	ALA	I-680 Express Bus to Silicon Valley	The project would create an express bus service along I-680 in southern Contra Costa County through Alameda County to employment destinations in Santa Clara County. The express bus would complement the proposed express lanes along the I-680 Corridor across the three counties and serve existing and proposed Park-and-Ride lots.	Varies	X			MTC PBA 2050***
11	Local Bus	ALA	Fremont Transit Network Improvements	Fremont: AC Transit operating funds for frequent network to support City Center, Centerville, Irvington, Warm Springs and Fremont Blvd PDAs.	\$300	X			MTC PBA 2050

#	Project Type	Co.	Title	Description	Cost Estimate (\$M)*	Short-Term** (0-4 Years)	Medium-Term (4-10 Years)	Long-Term (10+ Years)	RTP ID/ Source
12	Local Bus	ALA	LAVTA On-Demand First-Mile/Last-Mile Microtransit Program	LAVTA's on-demand microtransit program utilizes TNCs to expand coverage to lower-density areas where traditional fixed-route service is not cost-effective to operate. The program subsidizes passengers' TNC fare by 50 percent up to \$5 per trip, though fare and discount structures intended to be flexible. This micro-transit expansion service will not duplicate, but rather expand access to fixed-route buses and regional rail.	\$18	X			MTC PBA 2050
13	Local Bus	ALA	E14th/Mission and Fremont Blvd Multimodal Corridor – Rapid Bus and Mobility Hubs	Connect the communities of central and southern Alameda County with regional transportation facilities, employment areas, and activity centers. The corridor extends through five cities provides connections throughout the inner East Bay paralleling Interstate 880 and BART.	\$330	X			MTC PBA 2050
14	Commuter Rail	ALA	Irvington BART Station	Construct a new infill BART station in Irvington PDA in Fremont on Osgood Road near Washington Boulevard. (Under construction in 2022).	\$180	X			17-01-0058
15	Commuter Rail	ALA	ACE Near-Term Corridor Improvements	Includes ACE track improvements, preventative maintenance, fixed guideway, locomotive procurement, railcar midlife overhaul, positive train control, FTA non-urbanized formula program, Oakland to San José double track, and ACE Saturday service.	\$137	X			MTC PBA 2050
16	Regional Rail	ALA	Altamont Corridor Vision - Mid-Term (Alameda County Portion)	Alameda County - six additional round-trips between San Joaquin Valley and San José via Altamont Pass for weekend service (ten total daily round trips weekdays).	\$1,351	X			MTC PBA 2050

#	Project Type	Co.	Title	Description	Cost Estimate (\$M)*	Short-Term** (0-4 Years)	Medium-Term (4-10 Years)	Long-Term (10+ Years)	RTP ID/ Source
17	Regional Rail	ALA	Altamont Corridor Vision - Long Term (Alameda County portion)	15 minutes to 0.5 hour frequency during peak periods; dedicated track - "Universal Corridor". The Project would provide safe, frequent, and reliable service by modernizing the corridor connecting the Central Valley and San Francisco Bay Area.	\$6,416		X		ACE
18	P&R	ALA	Climate Program: TDM and Emission Reduction Technology	Projects in this category implement strategies and programs that reduce emissions, encourage alternative transportation modes, and manage transportation demand.	\$150		X		17-01-0002
19	Park-and-Ride	ALA	Scott Creek Road Park-and-Ride Lot	Construct a new Park-and-Ride lot at the Scott Creek Road interchange.	\$1.9	X			Caltrans
20	P&R	ALA	Bernal Avenue Park-and-Ride Lot	Tri-Valley Integrated Transit and Park-and-Ride Study proposes to construct a new Park-and-Ride lot at southwest corner of the Bernal Avenue interchange.	\$1.1	X			18548
Projects in Other Counties									
21	Interchange	SCL	I-680/Calaveras Interchange Improvements	Modify Calaveras SB Off-Ramp from an Exit Only to a Standard 2-Lane Exit.	\$32	X			MTC PBA 2050
22	Interchange	SCL	I-680/Jacklin Rd Interchange Improvements	Interchange Improvements.	\$3	X			MTC PBA 2050

#	Project Type	Co.	Title	Description	Cost Estimate (\$M)*	Short-Term** (0-4 Years)	Medium-Term (4-10 Years)	Long-Term (10+ Years)	RTP ID/ Source
23	Interchange	SCL	SR 237-Calaveras Expwy Overpass Widening	Widen the existing four lane I-680 overpass of Calaveras Expwy to six lanes with pedestrian and bicycle facilities in both directions.	\$85		X		17-07-0051
24	Auxiliary Lanes	CC	Construct Additional Auxiliary Lanes	Construct Additional Auxiliary Lanes: Alcosta Rd to Bollinger Canyon Rd, El Cerro Blvd to El Pintado Rd, El Pintado Rd to Stone Valley Rd, Stone Valley Rd to Livorna Rd, and Livorna Rd to Rudgear Rd.	\$24		X		17-02-0027
25	Managed Lanes	SCL	I-680 Express Lanes Calaveras to Scott Creek Road	Widen to add a NB Express Lane from Calaveras/ SR 237 to Alameda County Line.	\$40		X		17-10-0058
26	Express Bus	CC	Innovate 680	I-680 Transit Improvements including Express Bus Service, ITS components, and park & ride lots along the I-680 Corridor from Dublin to Martinez.	Varies	X			17-02-0051
27	Commuter Rail	SCL	Bart Extension Phase II, Berryessa to Santa Clara	BART Extension Phase II, Berryessa to Santa Clara.	\$5,581		X		17-07-0012
28	P&R	CC	Sycamore Valley Road, Danville, P&R Expansion	Increase parking capacity of Sycamore Valley Road Park-and-Ride Lot from 240 to 356 spaces. Includes C.3 bioretention, bicycle parking, electric vehicle charging stations and green infrastructure.	\$2	X			MTC PBA 2050

* Cost estimates in current dollars

** Expected for construction to begin

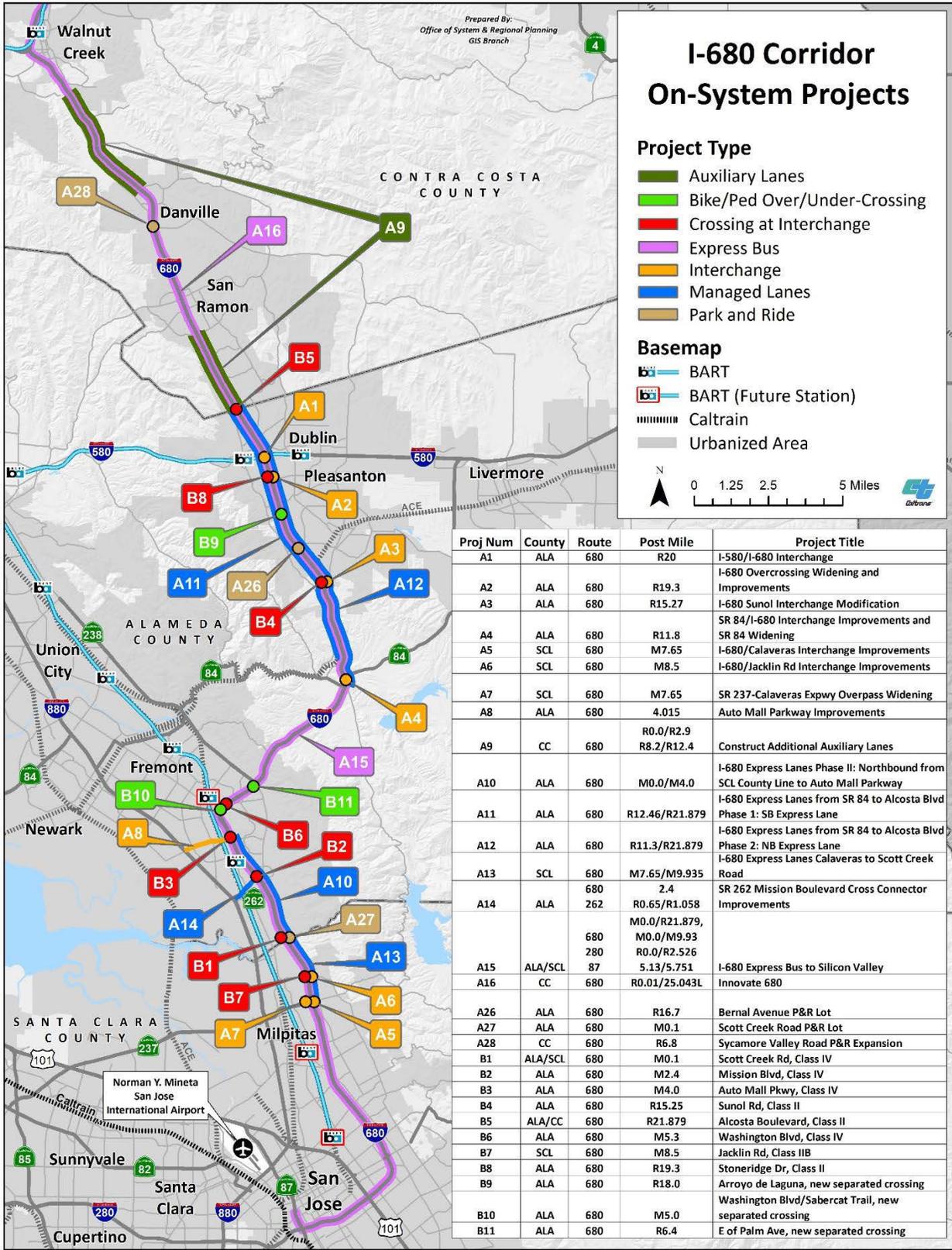
*** Plan Bay Area 2050, the Bay Area's next Regional Transportation Plan/Sustainable Communities Strategy, to be adopted in 2021

Table ES-3. Active Transportation Improvement Projects
(not in priority order)

#	Project Type	Co.	Title	Description	Cost Estimate*	Source
1	Crossing at Interchange	ALA	Scott Creek Road, Fremont	Interchange Reconstruction, ramps only, Class IV	>\$7M	D4 Bike Plan – Project List
2	Crossing at Interchange	ALA	Mission Boulevard, Fremont	Interchange Reconstruction, ramps only, Class IV	>\$7M	D4 Bike Plan – Project list
3	Crossing at Interchange	ALA	Auto Mall Pkwy, Fremont	Interchange reconstruction, ramps only, Class IV	>\$7M	D4 Bike Plan – Project List
4	Crossing at Interchange	ALA	Sunol Rd, Pleasanton	Interchange reconstruction, ramps only, Class II	>\$7M	D4 Bike Plan – Project List
5	Crossing at Interchange	ALA/CC	Alcosta Boulevard, San Ramon and Dublin	Minor Interchange Improvements (signage and striping), Class II	<\$250k	D4 Bike Plan – Project List
6	Crossing at Interchange	ALA	Washington Blvd, Fremont	Interchange reconstruction, ramps only, Class IV	>\$7M	D4 Bike Plan – Project List/Alameda County CTP Update
7	Crossing at Interchange	ALA	Stoneridge Dr, Pleasanton	Interchange reconstruction, full reconstruction, Class II	>\$7M	D4 Bike Plan – Project List
8	Bike/ped over/under-crossing	ALA	Arroyo de Laguna, Pleasanton	New separated crossing	>\$7M	D4 Bike Plan – Project List
9	Bike/ped over/under-crossing	ALA	Washington Blvd/Sabercat Trail, Fremont	New separated crossing part of Sabercat Trail (#24)	>\$7M	D4 Bike Plan – Project List
10	Bike/ped over/under-crossing	ALA	East of Palm Ave, Fremont	New separated crossing part of Mission Creek Trail (#25)	>\$7M	D4 Bike Plan – Project List
11	Local Project	ALA	Hopyard Rd	Hopyard Rd and Owens Dr Intersection Improvements	\$2.78M	City of Pleasanton CIP
12	Local Project	ALA	West Las Positas Blvd	Design West Las Positas Bicycle and Pedestrian Improvements	\$1.56M	City of Pleasanton CIP
13	Local Project	ALA	Amador Plaza Rd	Amador Plaza Rd Bike and Ped Improvements	\$1.4M	City of Dublin CIP; Bike and Ped Master Plan

#	Project Type	Co.	Title	Description	Cost Estimate*	Source
14	Local Project	ALA	Village Pkwy	Village Pkwy Bike and Ped Improvements	\$2.86M	City of Dublin Bike and Ped Master Plan
15	Local Project	ALA	City of Fremont	Fremont-Washington Project	\$22M	City of Fremont Bicycle Master Plan
16	Local Project	ALA	Warm Springs Blvd	Warm Springs Project	\$3.5M	City of Fremont Bicycle Master Plan
17	Local Project	ALA	Dublin/Pleasanton BART station and Dougherty Rd	Bike/Ped roadway in existing Alameda County ROW and Southern Pacific ROW	\$11.4M	Appx 1, Projects by County, MTC Transportation 2035 Plan
18	Trail (parallel)	ALA	City of Dublin – Iron Horse Trail	Iron Horse Trail Bridge at Dublin Blvd	\$1.5M	City of Dublin CIP
19	Trail (parallel)	ALA	City of Dublin – Alamo Creek Trail	Alamo Creek Trail Repair	\$664k	City of Dublin CIP
20	Trail (parallel)	ALA	Niles Canyon Trail	Entire Corridor - Design, environmental clearance and construction of a 6-mile Class I paved trail from Niles to Sunol through Niles Canyon. Includes two bridge structures.	\$100M	Alameda County CTP Update
21	Trail (with crossing)	ALA	Sabercat Trail	New trail from Irvington BART to Ohlone College with new I-680 Bridge and Blacow Undercrossing. Project includes an Interpretive Center on the west side of I-680 of Caltrans right of way	\$55.8M	Alameda County CTP Update
22	Trail (with crossing)	ALA	Mission Creek Trail Gap Closure	Trail gap closure from Palm Avenue to Mission Boulevard along the existing flood control channel.	\$4.2M	Alameda County CTP Update
23	Trail (parallel)	ALA	Grimmer Greenway Trail	New trail the ACFC flood control channel north side of Grimmer Boulevard between Fremont Boulevard and Paseo Padre Parkway/Central Park.	\$5.5M	Alameda County CTP Update
24	Trail (parallel)	ALA	East Bay Greenway Trail: Irvington Station Area	Segment of the proposed East Bay Greenway extension from north of Washington Boulevard to Blacow Road in the Irvington BART Station Area.	\$2M	Alameda County CTP Update
25	Crossing at Interchange	SCL	Jacklin Road, Milpitas	Minor Interchange Improvements (signage and striping), Class IIB	<\$250k	D4 Bike Plan – Project List

Figure ES-1. Recommended On-System Projects



Chapter 1: Introduction

1.1 Caltrans Policy Development

System Planning is the long-range Transportation Planning process for the California Department of Transportation (Caltrans). The System Planning process fulfills Caltrans statutory responsibility as owner/operator of the State Highway System (SHS) (Gov. Code §65086) by identifying deficiencies and proposing improvements to the SHS. Through System Planning, Caltrans focuses on developing System Planning products that address integrated multimodal transportation system needs and help advance Caltrans Mission, Vision and Goals. Over the past several years, especially with the passage of county-level sales tax measures for transportation funding, Caltrans has worked closely with local agencies such as the Alameda County Transportation Commission (Alameda CTC) and the Metropolitan Transportation Commission (MTC) to conduct system planning for the SHS.

This Comprehensive Multimodal Corridor Plan (CMCP) was developed in alignment with the goals, objectives and performance targets outlined in Caltrans Strategic Management Plan 2015-2020.¹ It is consistent with recommendations from the System Planning to Programming (SP2P) study and the Planning for Operations (P4Ops) Strategic Work Plan, both developed in 2017 by Caltrans Headquarters to help redefine System Planning's roles and products. It also follows the corridor planning process described in Caltrans Corridor Planning Process Guide, adopted in 2020.²

1.2 Senate Bill 1 and the Solutions for Congested Corridors Program

The Road and Repair Accountability Act of 2017, also known as Senate Bill 1 (SB 1)³, provides the first significant, stable, and on-going increase in State-directed transportation funding in more than two decades. SB 1 presents a balance of new resources and reasonable reforms to ensure efficiency, accountability, and performance from each dollar invested to improve California's transportation system.

Among the multiple programs established by SB 1 is the Solutions for Congested Corridors Program (SCCP). This program provides \$250 million annually on a competitive basis to Caltrans and regional agencies for projects designed to achieve a balanced set of transportation, environmental, and community access improvements within highly-congested travel corridors throughout the State. Eligible projects should make specific performance improvements and must be part of a Comprehensive Multimodal Corridor Plan (CMCP) designed to reduce congestion in highly-traveled corridors by providing more transportation choices for residents, commuters and visitors to the area while preserving the character of the local community and creating opportunities for neighborhood enhancements.

SCCP-eligible projects include improvements to State highways, local streets and roadways, public transit facilities, bicycle and pedestrian facilities, and restoration or preservation work that protects critical local habitats or open spaces. To temper increases in vehicle miles traveled (VMT), greenhouse gases (GHG) and air pollution, highway lane capacity-increasing projects funded by the program are limited to

¹ <https://dot.ca.gov/-/media/dot-media/programs/sustainability/documents/caltrans-strategic-mgmt-plan-033015-a11y.pdf>

² <https://dot.ca.gov/programs/transportation-planning/multi-modal-system-planning/guidelines-procedures/corridor-planning-process-guide>

³ <http://www.catc.ca.gov/programs/SB1.html>

high-occupancy vehicle (HOV) lanes, managed lanes, and other non-general purpose (GP) lane improvements such as auxiliary lanes, truck-climbing lanes and dedicated bicycle lanes.

The California Transportation Commission (CTC) adopted the 2018 Comprehensive Multimodal Corridor Plan Guidelines on December 5, 2018. The Guidelines prescribe a corridor planning process that largely mirrors what is outlined in the draft Caltrans Corridor Planning Guidebook. They also include sections and topics a CMCP should consider as well as performance measures that are consistent with the 2018 Solutions for Congested Corridors Program Guidelines.

1.3 Document Structure

The I-680 CMCP includes the following chapters:

- Chapter 1 – Introduction
- Chapter 2 – Corridor Goals, Objectives and Performance Metrics
- Chapter 3 – Corridor Overview
- Chapter 4 – Multimodal Facilities
- Chapter 5 – Freeway Performance
- Chapter 6 – Public Outreach
- Chapter 7 – Recommended Strategies

Long-Term Corridor Planning

It is acknowledged among the stakeholders that one of the main goals for this CMCP is to document funding needs consistent with SCCP for shovel-ready projects in the Corridor. Therefore, this CMCP is focused on what is attainable and is primarily based on information, data, studies and reports that are already available. It addresses the longer-term planning needs of the Corridor and will be revised and updated as needed.

The Alameda I-680 CMCP was developed during the Covid-19 pandemic. Future travel patterns, mode preferences, and transportation needs may change as a result of modified behaviors directly linked to this pandemic.

1.4 Stakeholders

Current CMCP development and its future updates are dependent upon the close participation and cooperation of all major stakeholders along the Corridor. A Corridor Development Team (CDT) was formed and met regularly to collaborate on the document development, provide strategic guidance at key decision points and ensure the on-time delivery of the I-680 CMCP. The CDT included representatives from the following agencies.

- Caltrans
- Alameda County Transportation Commission (Alameda CTC)
- Metropolitan Transportation Commission (MTC)

Chapter 2: Corridor Goals, Objectives and Performance Metrics

The goals, objectives and performance metrics for the Alameda I-680 CMCP were developed with the input from the Corridor Development Team and represent a consensus that was reached through a collaborative process. Information from a variety of sources helped inform the development of this chapter. The most notable sources include:

- Final Guidelines for the 2018 Solutions for Congested Corridors Program, California Transportation Commission (CTC), December 2017
- Final 2018 Comprehensive Multimodal Corridor Plan Guidelines, December 2018
- The 2016 Alameda Countywide Transportation Plan
- Development of the 2020 Alameda Countywide Transportation Plan
- The I-680 Managed Lanes Gap Closure Project Study Report, September 24, 2018, Traffic Operations Analysis Report, March 08, 2019, and Draft Environmental Impact Report,
- Plan Bay Area 2040 Final Performance Assessment Report, July 2017
- Development of Plan Bay Area 2050 (proposed development framework and draft project list)
- Caltrans District 4 Bicycle Plan

Table 2-1 lists the corridor goals, objectives and performance metrics. While existing sources contain data on several measures (including the number of collisions on freeways, vehicle-hours of delay (VHD), person throughput, occupancy rate, transit ridership, VMT, and traffic operations system (TOS) element inventory), there is not sufficient data to report on every quantifiable performance measure due to time and resource constraints. This list of metrics represents targets and measurements that can be carried into CMCP updates in the future, helping illustrate how corridor performance changes over time.

Table 2-1. Alameda I-680 CMCP Goals, Objectives and Performance Measures

Goals	Objectives	Performance Measures
1. Accessible, Affordable and Equitable	1.1 Increase number of multimodal options in the corridor and reduce gaps	<ul style="list-style-type: none"> • Bike/pedestrian path, including bike/pedestrian overcrossings • Continuous bicycle facilities • Continuous HOV/Express Lanes • Transit frequency
	1.2 Provide alternatives to driving alone	<ul style="list-style-type: none"> • Transit Ridership • Mode Split
	1.3 Increase number of first/last-mile connections to high quality transit in the corridor	<ul style="list-style-type: none"> • Mobility hubs • Transit station/bus stop served by protected bike and ped facilities
2. Safe, Healthy and Sustainable	2.1 Provide alternatives to driving alone	<ul style="list-style-type: none"> • Mode split of users in HOV/Express Lanes (SOV, HOV2, HOV3+, Transit) • Overall vehicle occupancy in the corridor • Transit ridership • Mode Split
	2.2 Reduce vehicle-miles traveled	<ul style="list-style-type: none"> • Vehicle Miles Traveled (VMT) • Person-throughput • Vehicle-throughput
	2.3 Reduce number of collisions	<ul style="list-style-type: none"> • Collisions on freeways • Pedestrian collisions in the Corridor • Bicycle collisions in the Corridor
	2.4 Increase coverage of high-quality bicycle and pedestrian facilities	<ul style="list-style-type: none"> • Bike/ped trails and overcrossings • Class 3+ bike facilities • Bike/ped freeway overcrossing or undercrossing gaps
	2.5 Support efficient land use	<ul style="list-style-type: none"> • Non-Single-Occupant-Vehicle Mode Share • Non-Vehicle Mode Share (e.g. walking, cycling, public transit use, rail use)
	2.6 Decrease exposure to criteria pollutants and GHG emissions	<ul style="list-style-type: none"> • PM2.5 and other pollutant levels • GHG levels
3. High Quality and Modern Infrastructure	3.1 Improve pavement condition on roadways in the corridor	<ul style="list-style-type: none"> • PCI Index Rating
	3.2 Increase coverage of TOS elements (traffic detection, changeable message signs, closed-circuit television, etc.)	<ul style="list-style-type: none"> • Ramp meters • TOS elements • Presence of fiber-optic

Goals	Objectives	Performance Measures
	3.3 Upgrade facilities to meet best practice in design of multimodal facilities	<ul style="list-style-type: none"> • Bike/ped trails and overcrossings • Class 4 bike facilities or Class 2 enhanced
	3.4 Optimize freeway system management and traffic operations	<ul style="list-style-type: none"> • Reduce freeway collisions • Reduce vehicle delay • Increase Person-throughput
4. Economic Vitality	4.1 Increase productivity of I-680	<ul style="list-style-type: none"> • Increase Vehicle-throughput • Increase Person-throughput
	4.2 Increase share of jobs accessible within 30 minutes of auto and 45 minutes of transit	<ul style="list-style-type: none"> • Travel time by mode
	4.3 Reduce recurring delay	<ul style="list-style-type: none"> • Person-hours of delay • Vehicle-hours of delay
	4.4 Reduce per capita delay on the freight network	<ul style="list-style-type: none"> • Truck travel time reliability
	4.5 Increase travel time reliability	<ul style="list-style-type: none"> • Travel time reliability (e.g. buffer index or planning time index)
5. Accommodate Current and Future Traffic Demand	5.1 Increase efficiency of traffic operations along I-680	<ul style="list-style-type: none"> • Vehicle Delay • Vehicle-throughput • Person-throughput • Vehicle occupancy
	5.2 Improve travel times for current and future users of the corridor	<ul style="list-style-type: none"> • Vehicle Delay (existing and forecast) • Vehicle travel time (existing and forecast)
	5.3 Provide alternatives to driving alone	<ul style="list-style-type: none"> • Mode split of users in HOV/Express Lanes (SOV, HOV2, HOV3+, Transit) • Overall vehicle occupancy in the corridor • Transit ridership • Mode Split

Chapter 3: Corridor Overview

3.1 Corridor Limits

The study area for the Alameda I-680 Comprehensive Multimodal Corridor Plan is an approximately 24-mile segment of the larger I-680 Corridor that also traverses Santa Clara County to the south, and Contra Costa and Solano Counties to the north. For the purpose of this CMCP, the I-680 Corridor is defined as starting at SR 237 in Santa Clara County and ending at the border of Alameda County and Contra Costa County. However, because I-680 is a major south-north connection between Silicon Valley in the South Bay and eastern Alameda County and central Contra Costa County in the East Bay as well as Solano County in the North Bay, serving local, regional and interregional traffic of people and goods, factors that may affect corridor performance and travel patterns (such as demographics and trip generators) are considered for all four counties. Within the corridor limits, I-680 intersects with multiple State highways: SR 262, SR 238, SR 84 and I-580.

The southern portion of the Corridor parallels I-880 that connects Oakland to Silicon Valley. Major parallel arterials are found along portions of the Corridor, such as Foothill Road in Pleasanton, Dougherty Road/Hopyard Road in Dublin and Pleasanton, Pleasanton Sunol Road, and Osgood Road/Warm Springs Boulevard in Fremont. I-680 was originally approved as an urban route by the Bureau of Public Roads for the Interstate Highway System in 1955, part of a freeway loop around the San Francisco Bay.

The I-680 Corridor is a multimodal corridor. Several transit agencies provide services within or near the Corridor. BART running in the median of I-580 crosses I-680 in Dublin/Pleasanton in eastern Alameda County. BART runs parallel to I-680 in southern Alameda County with an extension to downtown San José and Santa Clara planned, to be built in two phases. The extension into Santa Clara County is scheduled to open with two new stations, Milpitas and Berryessa. There is also a planned infill station for the Irvington area in Fremont. The Altamont Corridor Express (ACE) train provides commuter service from the Central Valley in San Joaquin County, through the Tri-Valley and Fremont area in Alameda County, ultimately to northern Santa Clara County and San José. This rail line travels in the vicinity of I-680 and serves similar commute flows as the Interstate. The Livermore Amador Valley Transit Authority (LAVTA) provides service within the Dublin/Pleasanton Area that parallels or makes use of I-680, notably bus lines 53, 54, 70X and 501. In southern Alameda County, AC Transit provides service with bus lines 215, 217 and 239 near the I-680 Corridor. Bicycling and walking are also important modal options parallel and across I-680 within the urban sections of the Corridor, providing local alternatives to vehicular travel. Multi-use paths and trails are also available in the I-680 Corridor within the unincorporated areas. See Chapter 4 for a more detailed discussion of these modes. For the purposes of this CMCP, the Corridor has been divided into two segments, as shown in **Table 3-1** and **Figure 3-1**.

Table 3-1. I-680 CMCP Segments

Segment	Location Description	County Route Beg. PM	County Route End PM	Length	Configuration 2019
1	SR 237 in Santa Clara County to SR 84 in Alameda County	SCL 680 M7.65	ALA 680 R11.04	14.0 miles	6 – 9 lanes* (1 Express lane)
2	SR 84 to Alcosta Boulevard, Dublin	ALA 680 R11.04	ALA 680 R21.88	10.3 miles	6 – 8 lanes

* A new northbound Express Lane will open in Segment 1 in late 2020

Segment 1 of the Corridor begins at SR 237 in Santa Clara County, and ends in Sunol at SR 84 in Alameda County. It is a six to nine-lane freeway with one express lane in the southbound direction. A northbound express lane is currently being constructed between Auto Mall Parkway and SR 84 and is expected to open in late 2020. Segment 2 is a six to eight-lane freeway without HOV/express lanes though a project to add HOV/express lanes on this segment is currently in the environmental phase. It begins at SR 84 and ends at the county border with Contra Costa County at Alcosta Boulevard.

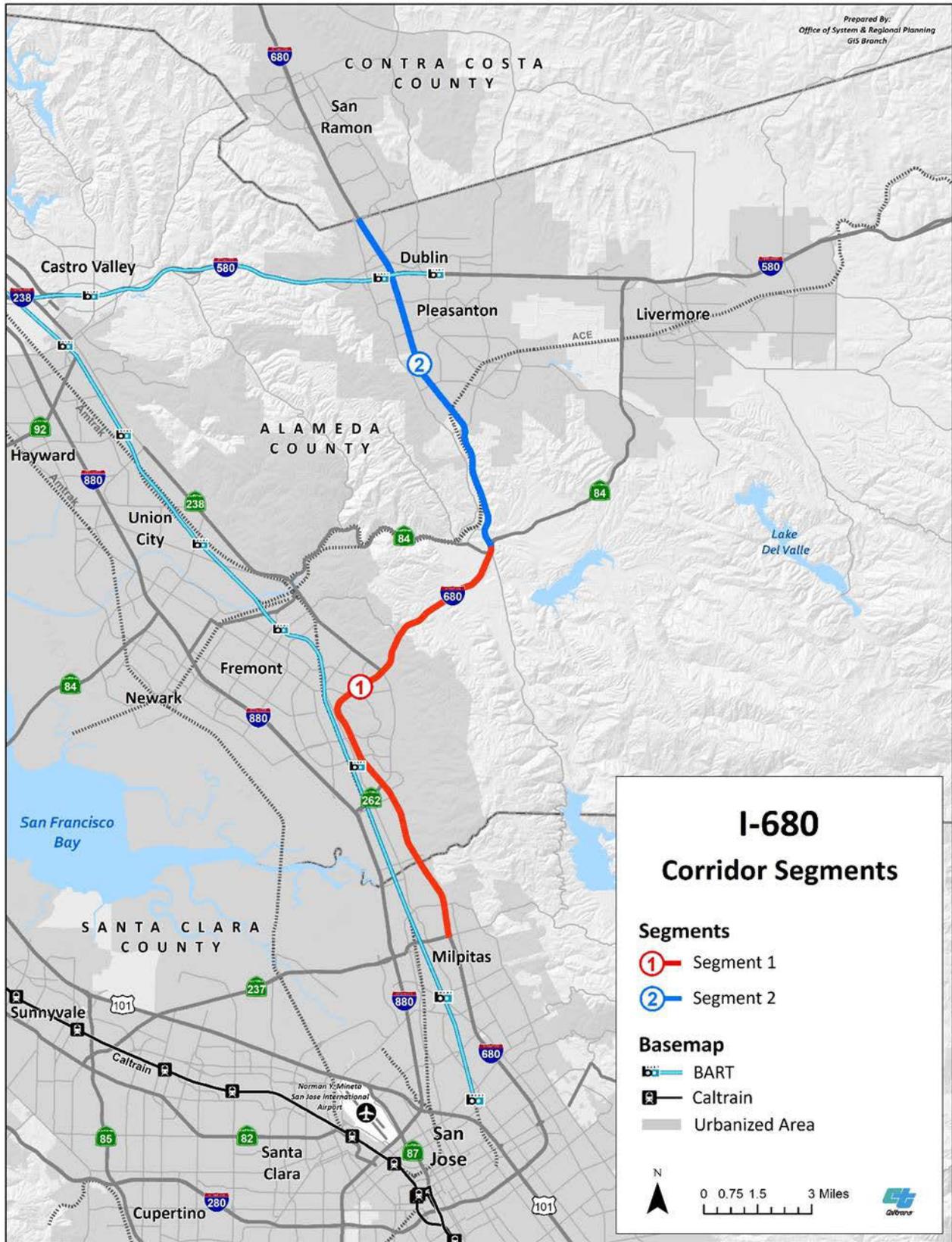
3.2 Route Significance

The Alameda I-680 Corridor is mostly urban in character except for open space between Fremont and Pleasanton. The route is a major south-north connector between Silicon Valley in the South Bay and eastern Alameda County and central Contra Costa County in the East Bay. Beyond the southern limit of the Corridor, I-680 travels through the cities of Milpitas and San José and terminates at US 101, which provides access to southern Santa Clara County and points south. At the US 101 Interchange, I-680 transitions into I-280, which provides connection to the Peninsula and San Francisco. I-680 also provides connection to the Central Valley via SR 84 and I-580. To the north, I-680 connects with I-80 in Solano County to Sacramento and beyond. The I-680 Corridor is one of the main connections between workers in Alameda and Contra Costa Counties and Silicon Valley, home to some of the world's most innovative high-tech industries and fastest-growing companies that significantly contribute to the State and national economies. The high-tech industry also has a cluster within the Tri-Valley area in eastern Alameda County, connected to Silicon Valley by I-680.

The Corridor serves local, regional, and interregional traffic of people and goods. Domestic and international visitors arriving at the Norman Y. Mineta San José International Airport (SJC) may use nearby routes to access I-680 to reach other parts of the State. Manufacturing hubs in Silicon Valley and Southern Alameda County use I-680 for transporting goods such as electronics and other high value technology related products. The Corridor also serves as an important freight connection for the movement of agricultural products from the Central Valley and from wineries in the Livermore Valley. Due to the many demands on this Corridor, travelers on I-680 also experience some of California's worst traffic congestion. According to MTC, northbound I-680 between Scott Creek Road and Andrade Road in Alameda County was ranked as the fourth most congested location in the Bay Area In 2017 with 6300 vehicle hours of delay during the PM peak period.⁴

⁴ https://mtc.ca.gov/sites/default/files/top_10_congestion_locations-2017.pdf

Figure 3-1. Corridor Segmentation



Source: Caltrans, District 4, GIS and Technical Support Branch, 2019

3.3 Route Designations

Within the Corridor, the two segments of I-680 are part of the California Freeway and Expressway System. They are part of the National Highway System (NHS), and the Strategic Highway Network (STRAHNET). I-680 is functionally classified as an Interstate and is designated as a Surface Transportation Assistance Act (STAA) National Network route for trucking. I-680 is part of the congressionally approved National Highway Freight Network. Between Walnut Creek (SR 24) and Fremont (SR 238), the route is officially designated as a Scenic Highway, while between SR 238 and Santa Clara County line, it is eligible for such a designation.

I-680 has been identified as one of the 93 statutory Interregional Road System (IRRS) routes in California, established in 1989 by the Blueprint Legislation (a ten-year transportation funding package created by AB 471, State Bill 300, and AB 973). **Table 3-2** provides a summary of all route designations of I-680.

Table 3-2. I-680 Route Designations

	I-680 (Segments 1 &2)
California Freeway and Expressway System ⁵	Yes
National Highway System	Yes
Strategic Highway Network	STRAHNET Route
Scenic Highway ⁶	Officially designated between SR 24 and SR 238. Eligible between SR 238 and SCL County line.
Interregional Road System (IRRS)	Yes
Federal Functional Classification	Interstate
Truck Designation ⁷	National Network (STAA)
Metropolitan Planning Organization	Metropolitan Transportation Commission (MTC)
Congestion Management Agency/ County Transportation Agency	Santa Clara Valley Transportation Authority (VTA) Alameda County Transportation Commission (ACTC)
Air District	Bay Area Air Quality Management District (BAAQMD)
Native American Tribes	Ohlone (non-federally recognized)
Terrain	Rolling
Land Use	Urbanized in northern Alameda and southern Alameda-northern Santa Clara Counties; rural between Pleasanton and Fremont in Alameda County.

3.4 Demographics

I-680 travels through four Bay Area counties. From south to north, these are Santa Clara, Alameda, Contra Costa, and Solano Counties. The combined population of Santa Clara and Alameda Counties totals 3.5 million people, roughly half of the population of the entire San Francisco Bay Area. The combined population of all I-680 counties totals 5 million. **Table 3-3** shows demographics of the counties of Santa

⁵ California Street and Highways Code, Article 2. The California Freeway and Expressway System https://leginfo.ca.gov/faces/codes_displayText.xhtml?lawCode=SHC&division=1.&title=&part=&chapter=2.&article=2., Accessed Oct of 2017

⁶ http://www.dot.ca.gov/hq/LandArch/16_livability/scenic_highways/index.htm, accessed Oct of 2017

⁷ Caltrans District 4 Truck Network Map, <http://www.dot.ca.gov/trafficops/trucks/truck-network-map.html>

Clara, Alameda, Contra Costa, and Solano with data sourced from the American Community Survey and the U.S. Census.

Alameda County

Alameda County has the second largest population among the Bay Area counties, at 1.63 million people in 2017. It has the lowest percentage of commuters who drive alone to work, mostly due to the density in land uses and transit service in the northern part of the County. For those commuting to other counties, most of them commute to San Mateo, Santa Clara and Contra Costa Counties. The high school educational attainment is 87.5 percent, while 45 percent holds a bachelor's degree or higher. The residents of Alameda County have a median income of about \$85,000. The County will have a projected population of 2,092,370 by 2040. About one in three Alameda County residents is foreign-born, and English is spoken at home in a little more than half of all households. Based on the 2017 American Community Survey, nearly twenty percent of the population does not speak English "very well."

Santa Clara County

Santa Clara County has the largest population in the nine-county Bay Area. In 2017, the population was just below 2 million people. Santa Clara County has a median household income of more than \$105,000, highest among all counties along I-680. About 87 percent of the population was a high school graduate and 50 percent had a bachelor's degree or higher. Most are employed in professional services that require higher levels of education. By 2040, the population is expected to increase to 2,538,320⁸. English is not the first language for 52 percent of the population in Santa Clara County. About twenty percent of the population does not speak English "very well." This means there is an increased need for a multilingual approach when conducting public outreach during project development. In addition, over 75 percent of those employed commute to work by single-occupancy vehicle, the second highest among the four counties, but their mean travel time is the lowest at about 28 minutes. The majority of the inter-county commute trips originating from Santa Clara County are destined to San Mateo and Alameda Counties.

Contra Costa County

Contra Costa County has a population of more than 1.1 million people in 2017. Two out of three commuters in Contra Costa County drive alone to work. For those commuting to other counties, most of them commute to Alameda, San Mateo and Santa Clara Counties. Median income was just below \$90,000. About one in three speaks a language other than English at home, and about one in seven does not speak English "very well." Of Contra Costa County residents, 89 percent are high school graduates and 40 percent have a bachelor's degree or higher. The County has a projected population of 1,387,295 by 2040.

Solano County

Solano County has the smallest population of the four counties along I-680, with less than half a million people in 2017. Like Santa Clara County, three out of every four commuters drive alone. Most of the workers commuting to other counties commute to Sacramento, Contra Costa, Alameda and Napa Counties. Median income is close to \$75,000. The educational attainment is 87 percent high school graduate while 44 percent holds a bachelor's degree or higher. The County has a projected population of 510,660 by 2040.

⁸ Plan Bay Area 2040 Projections, <http://projections.planbayarea.org/>

Table 3-3. Demographics Data of Counties served by I-680 Corridor

	Alameda County	Santa Clara County	Contra Costa County	Solano County
Total Population (2017)	1,629,615	1,911,226	1,123,678	434,981
Hispanic or Latino (2017)	22.5%	26.1%	25.3%	25.8%
White Alone (2017)	42.6%	45.5%	58.6%	52.7%
Black or African American Alone (2017)	11.1%	2.5%	8.6%	14.2%
Asian Alone (2017)	28.9%	35.1%	16.0%	15.3%
*Other (2017)	17.3%	16.8%	16.4%	10.5%
English Only (2017)	55.4%	47.6%	65.2%	70.3%
English not "very well"	18.4%	20.7%	14.1%	11.4%
Population Density (people/square mile) (2017)	1,984.9	1,481.6	1,397.6	480.1
Number of Households	596,898	630,451	409,117	147,352
Average Household Size (Owner-Occupied) (2017)	2.93	3.05	2.86	2.86
Average Household Size (Renter-Occupied) (2017)	2.66	2.88	2.86	2.92
Renter-Occupied Housing Units (2017)	47%	43.1%	34.5%	40%
Owner-Occupied Housing Units (2017)	53%	56.9%	65.5%	60%
Median Household Income (2017)	\$85,743	\$106,761	\$88,456	\$72,950
Drive Alone to Work (2017)	62.0%	75.1%	68.1%	76.6%
Mean Travel Time to Work (minutes)	32.5	28.0	37.1	31.8

Source: Data compiled from the American Community Survey (2017), and U.S. Census Bureau. Accessed June of 2019.

* Other includes: American Indian and Alaska Native Alone, Native Hawaiian and Other Pacific Islander Alone, Some Other Race Alone, and Two or More Races.

3.5 Commute Patterns and Trip Generators

Commute Choice by Mode

As shown in **Table 3-4**, the automobile is the dominant commute mode in the San Francisco Bay Area, accounting for almost 75 percent of all commute trips. Both Alameda and Contra Costa Counties have a lower percentage of automobile dependency and a higher usage of alternative modes of transportation for commuting than the regional average. One possible explanation is that many areas in both counties are well-served by transit, connecting to the job centers of downtown Oakland and San Francisco.

Table 3-4. Commute Choice by Mode

Commute Mode	Alameda County	Santa Clara County	Contra Costa County	Solano County	Bay Area
Auto	70.4%	85.9%	79.1%	90.8%	74.7%
Transit	15.1%	4.4%	10.4%	3.0%	11.9%
Walk	3.3%	2.3%	2.2%	1.0%	3.7%
Other*	4.0%	2.9%	2.1%	1.4%	3.5%
Work from Home	7.2%	5.4%	6.2%	3.7%	6.3%

Source: MTC Vital Signs, 2016

* Other includes bicycle, motorcycle, taxi, and other modes of transportation.

Land Uses and Major Trip Generators

I-680 traverses four counties with various land uses that include State/regional/County parks, agricultural lands, residential uses in urban and suburban communities, commercial uses in dense urban centers and office parks as well as industrial uses. There are also several institutional uses and sports venues within close proximity of the I-680 Corridor. The Corridor serves local and regional travel, linking commuters to major employment centers of economic significance, particularly Silicon Valley, and supporting interregional travel and goods movement. Below is a list of major trip generators in the vicinity of I-680 in four counties, many of which are outside of the CMCP limits but influence travel within the Corridor.

Alameda County Trip Generators

- Major employment centers, including within Dublin/Pleasanton and Fremont
- Stoneridge Shopping Center
- Alameda County Fairgrounds

Santa Clara County Trip Generators

- Norman Y. Mineta San José International Airport (SJC)
- Educational facilities, including San José State University and Santa Clara University
- Major sports facilities, including Levi's Stadium and SAP Center at San José
- Major employment centers, including the greater Silicon Valley and downtown San José

Contra Costa County Trip Generators

- Major employment centers, including within Walnut Creek, Concord and Bishop Ranch (San Ramon)

Solano County Trip Generators

- Employment centers in Benicia and Cordelia/Fairfield

3.6 Smart Mobility Framework, Regional Transportation Plan, Sustainable Communities Strategy & Communities of Concern

One of the goals of CMCPs is to identify and recommend transportation improvements that help to achieve a balanced transportation system with land use that provides more transportation choices and reduce greenhouse gas emissions while preserving the character of local communities. There are different tools that take both land use and transportation into consideration to help achieve this goal. At the State level, Caltrans has developed the Smart Mobility Framework that lays out a vision for multimodal travel choices, livable communities and a robust and sustainable economy. In the Bay Area, MTC has adopted the Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS) that combines transportation investment and sustainable development pattern to achieve the region's and State's greenhouse gas emission reduction goals. The following sections discuss these efforts in greater detail. In addition, Communities of Concern and areas of air quality burden are presented to highlight where disadvantaged groups are located along the Corridor.

Smart Mobility Framework

In 2010, Caltrans introduced the concept of Smart Mobility through the establishment of the Smart Mobility Framework (SMF).⁹ The SMF is a transportation planning guide that includes place-types to further integrate Smart Growth concepts into transportation and land use. CTC's CMCP Guidelines (2018) require all CMCPs be consistent with the principles of the SMF. The SMF is centered around the concept of location efficiency of a place. A high level of location efficiency points to the desired integration of transportation and land use to achieve high levels of non-motorized travel and transit use, reduced vehicle trip making, and shorter average trip length while providing a high level of accessibility. The SMF establishes seven place-types based on their respective Location Efficiency. Within each place type, there are also sub-categories to further differentiate one place from another. **Table 3-5** presents the SMF place-type definitions.

The SMF is not intended to replace or supersede local land use and zoning authority. Rather, it is a tool that suggests suitable strategies that would help places gain more location efficiency by taking existing land use characteristics and transportation facilities and services into consideration.

⁹ <http://www.dot.ca.gov/hq/tpp/offices/ocp/smf.html>

Table 3-5. Smart Mobility Framework Place Types

Place-Type	Place-Type Description
1. Urban Centers <ul style="list-style-type: none"> • 1a. Urban Cores • 1b. Urban Centers 	High density, mixed use places with high jobs-housing ratios overall, well-connected street network, high levels of transit service and pedestrian supportive environments. Transit oriented development fits into all of the urban place-types.
2. Close-In Compact Communities <ul style="list-style-type: none"> • 2a. Close-in Centers • 2b. Close-in Corridors • 3c. Close-in Neighborhoods 	Located near urban core or urban centers, close-in compact communities are comprised primarily of housing but with scattered mixed-use centers and arterial corridors forming the skeleton of the transportation system. Housing is varied in density and type. Transit is available to connect neighborhoods to multiple destinations, with an emphasis on serving commute trips. Residents may think of these communities as suburban, but the Smart Mobility Framework differentiates them from suburban communities because of the greater presence of location efficiency factors.
3. Compact Communities	Historic cities and towns as well as newer places characterized by strong presence of community design elements. While most compact communities are outside of metropolitan regions, some are on the periphery of metropolitan regions.
4. Suburban Communities <ul style="list-style-type: none"> • 4a. Centers • 4b. Corridors • 4c. Dedicated Use Areas • 4d. Neighborhoods 	Communities characterized by a low level of integration of housing with jobs, retail and services, poorly connected street networks, low levels of transit service, large amounts of surface parking, and inadequate walkability. Suburban communities are defined by weak-to-moderate presence of location efficient community factors. They vary with respect to regional accessibility; some suburban communities are located within easy commute distance of urban centers, while others are not. Places that share characteristics with suburban communities – such as a high proportion of detached housing – are categorized as being in the suburban community place type only if they match the place type characterization relative to location efficiency factors.
5. Rural and Agricultural Lands <ul style="list-style-type: none"> • 5a. Rural Towns • 5b. Rural Settlements and Agricultural Lands 	Settlement pattern with widely-spaced towns separated by farms, vineyards, orchard, or grazing lands. The rural and agricultural place type may include tourist and recreation destinations which can significantly affect land uses, character and mobility needs.
6. Protected Lands	Lands protected from development by virtue of ownership, long-term regulation, or resource constraints.
7. Special Use Areas ¹⁰ <ul style="list-style-type: none"> • 7a. Commercial with High Location Efficiency • 7b. Commercial with Low Location Efficiency 	Large tracts of single use lands with low levels of employment that are outside of, or poorly integrated with, their surroundings.

¹⁰ To help improve clarity of the place-type analysis, some modifications were made to the original definitions and two sub-types were created under Type 7, Special Use Areas. These are: Place Type 7a, Commercial with High Location Efficiency – large tracts of land used for commercial purposes such as business or industrial parks, warehousing/distribution, light manufacturing/repair, and heavy manufacturing with significant numbers of employees; and Place-Type 7b, Commercial with Low Location Efficiency – large tracts of commercial/industrial single use lands with low employment that are poorly integrated with their surroundings. Including low intensity recreational activities, such as golf courses (but not sports stadiums), and low employment public utilities like water treatment plants or electrical substations.

Place-Types along the I-680 Corridor

Figure 3-2 provides an example of the place-types along the Corridor, established by reviewing the satellite imagery of the existing development pattern and the transportation system including roadways, transit services and active transportation facilities. A larger scale place type map can be found in *Appendix A*.

As shown on the map, the central area of I-680 in Alameda County is a Protected Lands place-type (Type 6). Within this area, a quarry is shown as Special Use Area. To the north and south, Suburban Communities (Type 4) dominate much of the remainder of the Corridor. A few established downtowns or transit-oriented communities are visible: Downtown Fremont as Close-In Center (Type 2a) with a BART connection and relatively efficient land uses, and Main Street Pleasanton as Close-In Corridor (Type 2b). The majority of places along the Corridor are Suburban Communities Neighborhoods (Type 4d) and Suburban Communities Dedicated Use Areas (Type 4c).

Much of the development in the Corridor occurred from the 1950s on with significant grow spurts in the 1980s and 1990s. Both areas north and south of the Protected Lands place type have attracted high-tech sector businesses. **Table 3-6** presents the dominant place types in the corridor.

Table 3-6. *Place Type Examples within the I-680 Corridor*

Place Type	Place Type Examples within the I-680 Corridor
2a. Close-in Centers	Downtown Fremont
2b. Close-in Corridors	Main Street, Pleasanton
4c. Dedicated Use Areas	Business parks near Dublin/Pleasanton BART and Warm Springs/South Fremont BART stations.
4d. Suburban Communities - Neighborhoods	Various areas in Dublin, Pleasanton, Fremont and Milpitas.
5b. Rural Settlements & Agricultural Lands	Sunol
6. Protected Lands	Pleasanton Ridge, Mission Peak
7b. Special Use Areas	DeSilva Gates Aggregates, Castlewood Country Club

Transition Areas

The SMF place-type analysis also helps identify areas where transition from one place-type to another could potentially occur overtime. A review of plans underway along the Corridor suggests a few areas that may transition to places with higher location efficiency due to both investment in high capacity transit and higher density land use. Potential transition areas include:

1) Downtown Fremont

In addition to the current downtown plan by the city of Fremont that promotes a lively mixed-use, transit-oriented sustainable neighborhood¹¹, the BART extension to Silicon Valley and the potential rail across the Dumbarton Bridge may result in increased multimodal accessibility to the downtown area. The area is also designated as planned PDA in PBA 2040, called City Center. This could help transform the downtown area into a place-type with higher Location Efficiency.

2) Warm Springs and Irvington Districts

With the adoption of the Warm Springs/South Fremont Community Plan in 2014¹², the opening of the Warm Springs/South Fremont BART Station in 2017 and the designation as a planned PDA, the station area is expected to see more focused growth with diversity of land uses and increased accessibility. The area surrounding the future in-fill BART Station in the Irvington District (planned to be open in 2026), also designated as a planned PDA, will likely experience similar growth and accessibility improvement. As a result, both Warm Springs and Irvington Districts could transition into a higher location efficiency category.

3) Dublin/Pleasanton

There are planned and potential PDAs near the Dublin/Pleasanton BART Station. With enhanced Altamont Corridor Express (ACE) service and a potential future rail project to San Joaquin County, the station area would likely benefit from increased accessibility with more growth. LAVTA is currently conducting a Tri-Valley Hub Network Integration Study and the Dublin/Pleasanton BART Station is a potential location for a future regional and interregional transit hub. These changes may lead to a potential place-type transition in the surrounding area.

Transportation Investment Recommendations

Place Types help determine transportation needs. SMF identifies transportation strategies for each place type so a greater location efficiency can be achieved, and more smart mobility benefits can be realized in the future. **Table 3-7** lists place-types along the Corridor and identifies examples of planning considerations and transportation strategies for each place-type. See *Appendix A* for a complete list of recommended strategies.

¹¹ <http://www.fremont.gov/DowntownCommunityPlan>

¹² <http://www.fremont.gov/1515/Warm-SpringsSouth-Fremont>

Table 3-7. SMF Recommended Strategies Examples

Place-Type	Recommended Strategies Examples
2a: Close-In Compact Communities and Close-In Centers 2b: Close-In Corridors	<ul style="list-style-type: none"> • High capacity transit • Street network connectivity with high amenity level • Maintain/improve public safety • Complete neighborhoods • Space for recreation
4c: Dedicated Use Areas 4d: Suburban Communities – Neighborhoods	<ul style="list-style-type: none"> • Identify centers and corridors that can be transformed into more location-efficient places • Investments that improve the operational efficiency of existing arterial and freeway corridors • Speed management • Ride-share promotion • Strategic redevelopment of commercial corridors • Strong community presence for all new development
5b: Rural and Agricultural Lands – Rural Settlements and Agricultural Lands	<ul style="list-style-type: none"> • Inside towns, walking and bicycling facilities focused on connectivity and comfort • Designate land for long-term agricultural use • Safety improvements for walking and bicycling • Demand-responsive transit • Park-and-ride lots
6: Protected Lands	<ul style="list-style-type: none"> • Where public access and recreational use is permitted, bicycle facility, and trail projects
7B: Special Use Areas – Non-Commercial SMF	<ul style="list-style-type: none"> • Provide access and connectivity improvements that are specific to use and location

Plan Bay Area 2040

Plan Bay Area 2040 (PBA 2040), approved July 2017, is the RTP/SCS for the Bay Area, and responds to Senate Bill 375 (2008), which requires each of the State’s 18 metropolitan regions to develop a Sustainable Communities Strategy (SCS) to accommodate future population growth while reducing greenhouse gas emissions from cars and light trucks. MTC produced the RTP/SCS in concert with the Association of Bay Area Governments (ABAG) which is responsible for developing regional housing and employment forecasts. The Plan charts a course for reducing per-capita greenhouse gas emissions through the promotion of more compact, mixed-use residential and commercial neighborhoods near transit. MTC is currently in the process of developing PBA 2050, an update to the RTP/SCS. The CTC CMCP Guidelines require CMCPs be consistent with the goals and objectives of the RTP, including the forecasted development pattern identified in the SCS.

The regional forecast shows that between 2010 and 2040, the Bay Area is projected to grow from 3.4 to 4.7 million jobs, while the population is projected to grow from 7.2 to 9.5 million people. As of 2015, almost half of the projected jobs have been added and nearly a quarter of the projected population growth has occurred. During the same period, only 13 percent of projected household growth has occurred, held back in part by financial conditions as a result of the 2008 Great Recession.¹³

PBA 2040 projects and programs along the I-680 Corridor can be found in Chapter 7, along with projects in other plans and funding programs.

¹³ MTC, Plan Bay Area 2040 (2017): <http://2040.planbayarea.org/forecasting-the-future>

Priority Development Areas, Priority Conservation Areas and Priority Production Areas

PBA 2040 establishes Priority Development Areas (PDA) and Priority Conservation Areas (PCA). PDAs are areas within existing communities that local city or county governments have identified and approved for future growth. These areas typically are transit accessible and are located near established job centers, shopping districts and other services. PCAs are locations designated for the protection of natural habitats and the preservation of open space for future generations, including farming, ranching, recreational and resource lands. PCAs are identified through consensus by local jurisdictions and Park/Open Space Districts. Unlike SMF place types that are based on existing characteristics, PDAs and PCAs point to a future growth pattern supported by plans adopted by local governments.

With the development of PBA 2050, MTC is updating the regional growth framework by refreshing PDAs and PCAs as well as introducing a new designation called Priority Production Area (PPA). PPAs are areas zoned for industrial use or have a high concentration of industrial activities such as production, advanced manufacturing, distribution, or related activities that local jurisdictions can nominate for inclusion into PBA 2050. The updated PDAs and PCAs and the newly designated PPAs will help focus new housing and job growth in the region. PDAs in the counties of Santa Clara, Alameda, Contra Costa and Solano help accommodate a large share of the forecasted growth in the Bay Area. Below is a list of PDAs located within proximity to I-680, including those in the current PBA 2040 and those that have been submitted to MTC for inclusion into PBA 2050. MTC is updating the PDA framework as part of the PBA 2050 development, so some of the PDAs may change. Newly proposed PPAs along I-680 are listed separately.

Alameda County PDAs

- Warm Springs (Fremont)
- Irvington District (Fremont)
- City Center (Fremont)
- Centerville (Fremont)
- Hacienda (Pleasanton)
- Downtown Specific Plan Area (Dublin)
- Transit Center/Dublin Crossings (Dublin)
- Town Center (Dublin)
- Osgood Road (Fremont) - proposed
- Warm Springs Boulevard (Fremont) - proposed

Santa Clara County PDAs

- Greater Downtown (San José)
- Downtown “Frame” (San José)
- VTA City Cores, Corridors & Station (San José)
- East Santa Clara/Alum Rock Corridor (San José)
- Berryessa Station (San José)
- Capitol Corridor Urban Villages (San José)
- North San José (San José)
- Transit Area (Milpitas)
- VTA City Cores, Corridors & Station (Milpitas)
- Midtown Specific Plan (Milpitas) - proposed

Contra Costa County PDAs

- City Center (San Ramon)
- North Camino Ramon (San Ramon)
- Downtown (Danville)
- Core Area (Walnut Creek)
- Contra Costa Center (Contra Costa County)
- Buskirk Avenue Corridor (Pleasant Hill)
- Diablo Valley College (Pleasant Hill)
- Downtown (Concord)
- Community Reuse Area/Los Medanos (Concord)
- Downtown (Martinez)

Solano County PDAs

- Downtown (Benicia)
- Northern Gateway – Benicia Industrial Park (Benicia)

Proposed Priority Production Areas along I-680 include:

Santa Clara County PPAs

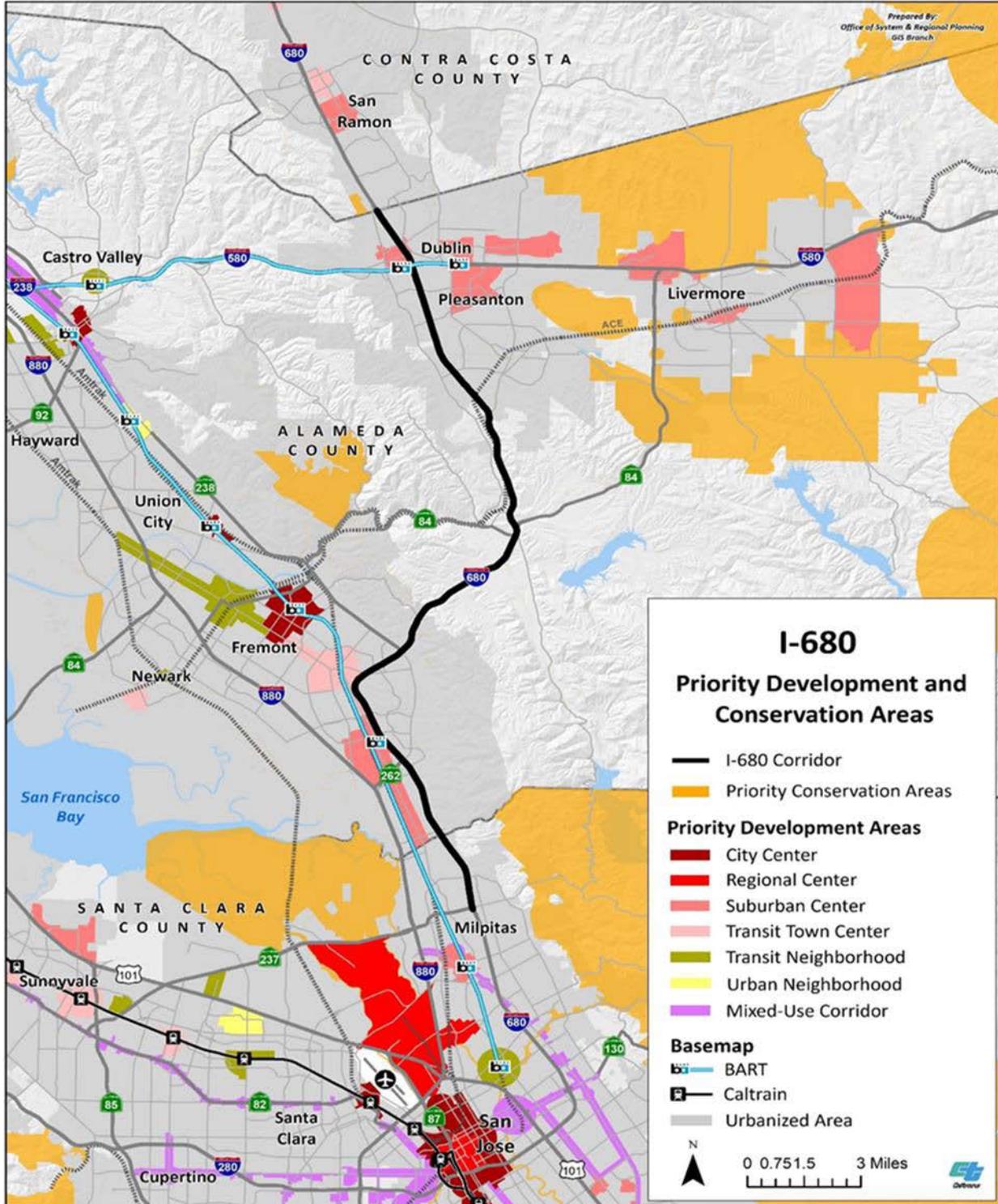
- Central Manufacturing Area (Milpitas)
- McCarthy Ranch Industrial Area (Milpitas)
- Southwestern Employment Area (Milpitas)
- 'Rockspring' (San José)

Alameda County PPAs

- Bayside Industrial (Fremont)
- Pacific Commons (Fremont)
- Union City (Union City)

See **Figure 3-3** for PDAs and PCAs along the I-680 Corridor.

Figure 3-3. Priority Development Areas and Priority Conservation Areas



Source: MTC, 2017. This map does not include proposed PDAs, PCAs, and PPAs for Plan Bay Area 2050.

Geographic Areas of Concern

MTC has developed a land use designation called “Communities of Concern” which are communities that have high concentration of both minority and low-income households or that have a concentration of other factors¹⁴ including people with disabilities, Seniors, and cost-burdened renters. MTC identified locations where these population groups are in relative high concentration as part of Plan Bay Area 2040.¹⁵ The additional factors to identify Communities of Concern include:

1. Limited English Proficiency
2. Zero-Vehicle Household
3. Seniors 75 Years and Over
4. People with Disability
5. Single-Parent Family
6. Severely Rent-Burdened Household

Analysis has been conducted to further identify disadvantaged communities via CalEnviroScreen 3.0.¹⁶ CalEnviroScreen is a screening methodology that is used to identify communities burdened by multiple sources of pollution and their potential health effect. The tool utilizes a number of sources to determine the level of risk a community faces:

- Pollutants, such as Particulate Matter 2.5, ozone, diesel emissions, pesticides, toxic releases. Poor drinking, brownfield remediation (cleanup) sites, groundwater threats, hazardous waste water, and solid waste
- Level of asthma occurrence, low birth rates, cardiovascular risks, education levels, linguistic Isolation, poverty, unemployment rate, and housing burden

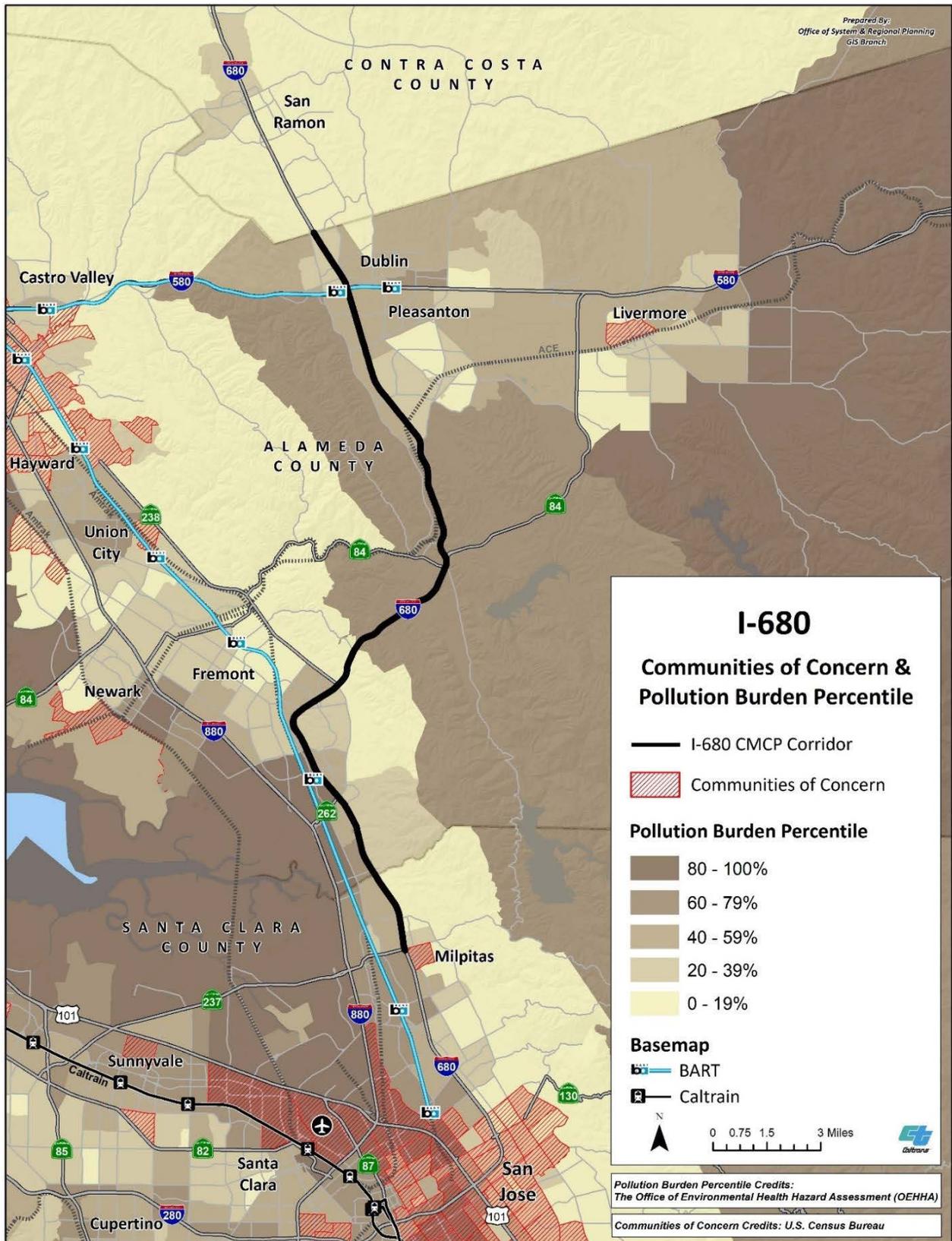
Figure 3-4 presents a map of these two geographies along the I-680 Corridor.

¹⁴ <http://www.planbayarea.org/2040-plan/plan-details/equity-analysis>

¹⁵ <http://mtc.maps.arcgis.com/home/webmap/viewer.html?webmap=7ce7b5ba22514340bb7dffdc6bdc4287>

¹⁶ <https://oehha.ca.gov/calenviroscreen/report/calenviroscreen-30>

Figure 3-4. MTC's 2017 Communities of Concern and Pollution Areas along I-680



Source: MTC, 2017 and CalEnviroScreen, 2018

3.7 Environmental Considerations and Sea Level Rise

Environmental Considerations

The purpose of this environmental scan is to conduct a high-level identification of potential environmental factors that may require future analysis in the project development process. This is a high-level, qualitative evaluation of the environmental factors in the Corridor for planning purposes to try to avoid late surprises that may significantly affect project cost and schedule during future phases of the project development process. Information presented here may not represent all environmental considerations that exist within the Corridor vicinity. The factors are categorized based on a scale of a low-medium-high probability of an environmental issue. **Table 3-8** shows some environmental considerations within the I-680 Corridor. For the purposes of the CMCP, the most important environmental considerations for funding include “direct mitigation,” restoration, and/or protection of critical habitat and open space, such as with section 4(f) lands that are prominent in the Corridor.

Table 3-8. Environmental Consideration for the I-680 Corridor

	Segment	
	1	2
Section 4(f) Land ¹⁷	High	High
Farm/Timberland ¹⁸	Low	Low
Floodplain ¹⁹	100 year	100 year
Climate Change/Sea Level Rise ²⁰	Low	Low
Waters and Wetlands ²¹	Low	Low

Air Quality

The California Legislature created the Bay Area Air Quality Management District (BAAQMD) in 1955, as the first regional air pollution control agency in the country. BAAQMD is tasked with regulating stationary sources of air pollution in the nine-county Bay Area except northern parts of Sonoma and Solano Counties. It is governed by a 24-member Board of Directors composed of locally-elected officials from each of the nine counties, with the number of board members from each county being proportionate to its population. Any project of regional significance (design concept, scope, and open-to-traffic date assumptions) will need to be consistent with the regional emissions analysis performed for the current RTP and Transportation Improvement Program (TIP).

Sea Level Rise

Sea level rise (SLR) is perhaps the best documented and most accepted impact of climate change, which can be directly tied to increased levels of greenhouse gas (GHG) emissions. Executive Order B-30-15 has directed State agencies to reduce GHG emissions forty percent by 2030.²² California is on track to meet the 2020 GHG reduction target. The location along I-680 most at risk for inundation is found in Contra

¹⁷ CDFW Owned & Operated Lands & Conservation Easements, <https://map.dfg.ca.gov/bios/>, accessed Oct of 2017

¹⁸ ftp://ftp.consrv.ca.gov/pub/dlrp/FMMP/pdf/statewide/2012/fmmp2012_wallsizes.pdf, accessed Oct of 2016.

¹⁹ NFHL 1% (100 year) Flood, <https://map.dfg.ca.gov/bios/>

²⁰ ART Bay Shoreline Flood Explorer, <https://explorer.adaptingtorisingtides.org/explorer>

²¹ San Francisco Estuary Institute, <https://www.sfei.org/projects/3032#sthash.OgLFN98.dpbs>

²² Governor Brown Executive Order Greenhouse Gas Reduction Target, April 2015

<https://www.ca.gov/archive/gov39/2015/04/29/news18938/index.html>

Costa County, directly south of the Carquinez Strait. In Alameda County, there is no risk of flooding associated with sea level rise that has been identified.

Chapter 4: Multimodal Facilities

As a multimodal transportation corridor, the I-680 Corridor serves the movement of people and goods with a variety of transportation modes. This chapter describes public transit services, park-and-ride facilities, private commuter shuttle services, and pedestrian and bicycle facilities within the I-680 Corridor. It also identifies programmed, planned and in some cases proposed projects within the Corridor. In addition, the chapter summarizes the Transportation Systems Management and Operations (TSMO) strategies and equipment that are currently deployed within the Corridor and examines the networks and major trip generators for freight movement.

Complete Streets Policies

At the State level, Caltrans Deputy Directive DD-64-R2 requires Caltrans to provide for the needs of travelers of all ages and abilities in all planning, programming, design, construction, operations, and maintenance activities and products of the State Highway System. It requires Caltrans to develop integrated multimodal projects and facilitate bicycle, pedestrian, and transit travel by creating a network of “Complete Streets.”²³ At the regional and county levels, MTC and Alameda CTC both have Complete Streets requirements in order to qualify for certain funding programs, such as MTC’s One Bay Area Grant (OBAG) program and Measure BB programs administered by Alameda CTC.²⁴

4.1 Transit Services

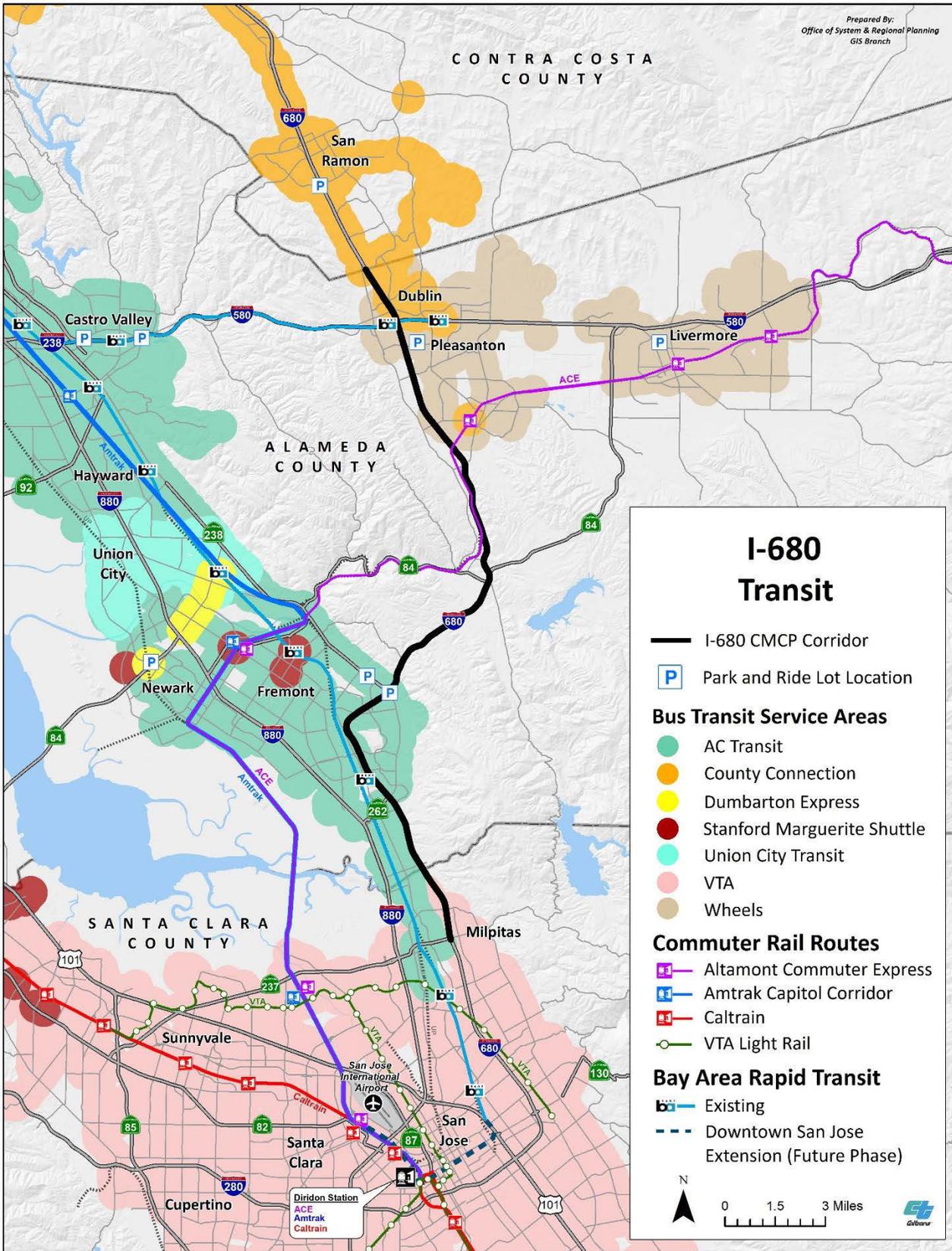
A number of public transit agencies provide services within the I-680 Corridor. Some agencies are specialized in one type of service, such as rail, while others provide a variety of transit services.

The transit services present in the vicinity of I-680 are illustrated in **Figure 4-1**, summarized in **Tables 4-1** and **4-2**, and further described in the sections below. These include BART, ACE Rail, Livermore Amador Valley Transit Authority (LAVTA)/Wheels, Santa Clara Valley Transportation Authority (VTA), Alameda-Contra Costa Transit (AC Transit), County Connection and Amtrak/Capitol Corridor. Additional discussion is provided on transit services in Solano County that operate along I-680 into Contra Costa County.

²³ http://www.dot.ca.gov/hq/tpp/offices/ocp/docs/dd_64_r2.pdf

²⁴ <https://www.alamedactc.org/planning/complete-streets-in-alameda-county/>

Figure 4-1. Transit Services Along or Near I-680



Source: Caltrans, District 4, GIS and Technical Support Branch, 2020

Table 4-1. Express Bus Routes that Travel on I-680 in Alameda County

Operator	Route	Origin-Destination	Entry Interchange	Exit Interchange	Approx. Length along I-680 (mi)	Peak Period Headway (min)
County Connection	92X	Pleasanton ACE Station – Mitchell Dr Park-and-Ride	Bernal Ave	Ygnacio Valley Rd	16.0	60
	97X	Dublin/Pleasanton BART Station – San Ramon Transit Center	I-580	Bollinger Canyon Rd	4.5	60
LAVTA/Wheels	53	Pleasanton ACE Station – Stoneridge Mall	Bernal Ave	Stoneridge Drive	2.5	60
	54	Pleasanton ACE Station – Dublin/Pleasanton BART Station	Bernal Ave	I-580	3.5	60
	70X	Dublin/Pleasanton BART Station – Pleasant Hill BART Station	Dublin Blvd	Treat Blvd	18.0	30

Table 4-2. Bus Routes that Cross or Travel Adjacent to I-680 in Alameda County

Operator	Route	Origin-Destination	Road Crossing I-680 (OC/UC)*	Major Roads Adjacent to I-680
AC Transit	210	Union Landing Transit Center – Mission Center Ohlone College	Washington Blvd (OC)	Washington Blvd
	215	Fremont BART Station – Kato Road & Benicia Street	N/A	Osgood Rd
	217	Fremont BART Station – Great Mall/Main Station	Mission Blvd (UC), S Grimmer Blvd (UC)	Mission Blvd, Warm Springs Blvd
	239	Fremont BART Station – Warm Springs District	S Grimmer Blvd (UC), Mission Blvd (UC)	Grimmer Blvd, Mission Blvd, Warm Springs Blvd
LAVTA/Wheels	3	Dublin/Pleasanton BART Station – Stoneridge Mall	Stoneridge Dr (OC)	Stoneridge Dr
	8	Dublin/Pleasanton BART Station – South Pleasanton	N/A	Hopyard Rd, Valley Ave
	30R	West Dublin/Pleasanton BART Station – Lawrence Livermore National Laboratory	Dublin Blvd (UC)	Dublin Blvd
	501-504	School Routes	Alcosta Blvd (OC)	Multiple
	601-611	School Routes	Stoneridge Dr (OC) W Las Positas Blvd (OC)	Multiple
VTA	120	Fremont BART Station – Lockheed Martin/Moffett Park	Mission Blvd (UC)	Mission Blvd, I-880
	140	Fremont BART Station – Mission College & Montague Expy	Mission Blvd (UC)	Mission Blvd, I-880
	180	Great Mall/Aborn & White – Warm Springs BART Station	N/A	Mission Blvd, I-880
	181	San José Diridon Station – Warm Springs BART Station	N/A	Mission Blvd, I-880

* OC = overcrossing, UC = undercrossing

Overview of Transit Services by Service Type

Express Bus

Livermore Amador Valley Transit Authority (LAVTA)

LAVTA operates the Wheels fixed route and paratransit service in the Tri-Valley communities of Dublin, Livermore and Pleasanton with connections to BART. Wheels buses offer regional connections by providing links between two BART stations (West Dublin/Pleasanton and Dublin/Pleasanton) and three ACE Rail stations (Livermore and Vasco Road Stations in Livermore and Pleasanton Station in Pleasanton). Wheels also connects with six other public transportation systems including the Central Contra Costa Transit Authority (County Connection), Amtrak, the Modesto Area Express (MAX), Solano County Transit (SolTrans), the San Joaquin Regional Transit District (RTD), and West Contra Costa Transit Authority (WestCAT). In 2019, Wheels supported an average daily ridership of over 6,500 passengers, an annual fixed route ridership of over 1.66 million passengers, and an annual paratransit ridership of over 48,000 passengers.

Within LAVTA's larger express bus network, Express Bus Line 70X moves transit riders along I-680 to and from East Dublin/Pleasanton BART Station to Walnut Creek BART Station in the mornings, and in the afternoons to and from Dublin BART Station to Pleasant Hill BART Station.

As part of their FY 2019 Management Action Plan (MAP), LAVTA has indicated one of their primary goals to be service development. The strategies to meet this goal include providing routes/services to meet current and future demand for timely/reliable transit service, optimizing existing routes/services to increase productivity and response to regional projects and studies, and providing routes/services to promote mode shift from personal car to public transit. Within the MAP, several LAVTA initiatives have been identified to further this goal, including:

- Short Range and Long-Range Transit Plan
- Network Integration Study
- Comprehensive Paratransit Assessment (aka Mobility Forward)
- Transit Signal Priority Upgrade Project in Rapid Corridors
- Advanced Intelligent Intersection Project

County Connection

The Central Contra Costa Transit Authority (commonly known as County Connection) provides bus service to the cities of Clayton, Concord, Lafayette, Martinez, Orinda, Pleasant Hill, San Ramon, Walnut Creek; the towns of Danville and Moraga; and the unincorporated areas of central Contra Costa County. Two of its express routes travel into Alameda County to Pleasanton and Dublin.

County Connection currently runs two express routes that travel along I-680 within Alameda County. Route 92X operates between the Pleasanton ACE Station and Mitchell Drive Park-and-Ride lot (in Walnut Creek) and offers three morning and afternoon peak period trips. Route 97X operates between the Dublin/Pleasanton BART Station and San Ramon Transit Center with a 30-minute headway during the morning and afternoon peak periods.

As part of their 2016-2025 Short Range Transit Plan (SRTP), County Connection outlined "status quo" operating, capital, and financial plans (such as fleet replacements, facility maintenance, and street

amenities) which add sufficient service each year to keep pace with basic growth levels within the service areas. Additionally, the SRTP defines a potential future “vision” that offers opportunities to dramatically enhance services, contingent upon securing new funding sources (such as a future CCTA Measure J sales tax extension, BART parking fees, and/or California Air Resources Board Cap and- Trade funds). The future vision identifies 15-minute BART feeder routes and Bishop Ranch circulator routes, as well as an “I-680 Corridor Service Improvements” package that includes Park-and-Ride lots (with smart mobility hubs)²⁵, local and bus services, operation of express buses on the shoulders of I-680, and increased school bus service.

Santa Clara Valley Transportation Authority (VTA)

VTA provides a full coverage of transit services to all of Santa Clara County. The agency also participates as a funding partner in regional rail service including Caltrain, Capitol Corridor, and the Altamont Corridor Express (ACE). In 2018, VTA had an average weekday system ridership of over 117,000, contributing to an annual bus ridership of 27.6 million and an annual light rail ridership of 8.6 million.

Although VTA does not currently operate any bus routes that travel on I-680 in Alameda County, a few express routes cross or parallel a portion of the corridor near the southern border with Santa Clara County. Express Routes 120 and 140 connect the Fremont BART Station to Mountain View and north San José, respectively, and Express Routes 180 and 181 connect the Warm Springs BART Station to east San José and central San José (Diridon station), respectively. In the southern-most portion of I-680, VTA Route 103 travels along I-680 from Eastridge Transit Center to Fruitdale and Southwest Expressway.

I-680 Corridor Express Bus Planning

In an effort to combat heavy AM/PM peak period commuting traffic along the corridor, as well as currently limited long-distance transit options, Contra Costa Transportation Authority (CCTA) is exploring mobility solutions through their Innovate 680 initiative. Innovate 680 has a few key elements that aim to increase the efficiency and sustainability of the I-680 corridor, including completing managed lanes, increasing express bus service, utilizing travel demand management strategies, and implementing technology strategies for first/last mile connections and enhanced corridor operations.

Similarly, Alameda CTC is exploring a concept of express bus service along I-680 that could operate between the Tri-Valley and Silicon Valley and that would utilize the travel time savings provided by travel in a dedicated managed lane. This express bus service would require the completion of the I-680 Express Lane Gap Closure project to operate at optimal efficiency and utilizes buses to provide access to additional commute options, including BART, Amtrak, Caltrain, VTA light rail, local bus service, and Greyhound, for those living along the corridor. Potential operating characteristics include twenty-minute headways during peak periods with service to existing park-and-ride lots in the Corridor and a potential new park-and-ride lot at the Bernal Avenue Interchange in Pleasanton. There is a possibility for this service to connect to Innovate 680 at the Contra Costa County border. Both of these projects are considered as part of this CMCP.

²⁵ These facilities not only provide parking spaces and passenger amenities, but also have the potential to incorporate car sharing, bike sharing, demand-responsive services and employer-based transportation services.

Heavy Rail

Bay Area Rapid Transit (BART)

The BART system consists of 112 miles of heavy rail and 46 stations located throughout Alameda, Contra Costa, San Francisco and San Mateo Counties. BART currently has 669 revenue vehicles to provide service on weekdays and weekends. BART averaged 433,000 weekday trips in 2016. BART is currently the fifth busiest heavy rail rapid transit system in the United States.^{26,27,28}

Although BART does not operate a route directly along I-680, the system's Dublin/Pleasanton and Warm Springs/South Fremont lines have stations near I-680 within Alameda County. As a result, the Corridor is utilized by commuters that connect to the BART network via existing stations in Dublin and Fremont.

Two on-going BART-oriented projects would improve BART connectivity and reach commuters along the I-680 Corridor: BART extension to Silicon Valley and BART Bay Fair Connector. The Valley Transportation Authority (VTA) in Santa Clara County is constructing a long-planned extension of BART into Silicon Valley. The first extension opened in 2017 to the Warm Springs district in Fremont and the opening of the Phase I extension to the Berryessa District in San José is planned for June 2020. Phase II extension to downtown San José and Santa Clara is currently in the environmental phase with a target date for passenger service no later than 2030.

The BART Bay Fair Connector project would modify the BART Bay Fair Station and approaches to add one or more additional tracks and one or more passenger platforms for efficient train service, operational flexibility, and ability to handle transit service increases. Once constructed, this project would enable a one-seat ride from the Tri-Valley to Silicon Valley.

Along with these two planned projects, BART has other key projects to enhance the system and increase capacity.²⁹ These enhancements include:

- New train cars
- Communication-based train control modernization
- New Hayward maintenance complex
- Traction power upgrades
- Station modernization program
- Investment in Transit Oriented Development
- Earthquake safety upgrade

The first of these enhancements are typically called BART Core Capacity project. This multibillion-dollar investment in the core system will enable BART to increase frequencies with longer train cars, improving its ability to serve new demands from both the existing network and extensions that will bring additional ridership.

²⁶ <http://www.bart.gov/about/history/facts>

²⁷ https://www.bart.gov/sites/default/files/docs/BARTfactsheet_Apr17_0.pdf

²⁸ <http://www.apta.com/resources/statistics/Documents/Ridership/2016-q4-ridership-APTA.pdf>

²⁹ <http://www.bart.gov/about/projects>

Interregional Rail

Several interregional rail operators run along rail tracks that are parallel to I-680 in portions within Alameda County and serve similar travel markets as the I-680 Corridor. Currently, the two passenger rail operators are the Altamont Corridor Express and Capitol Corridor. There is a planned rail extension into San Joaquin County along the I-580 Corridor that is currently called Valley Link.

Altamont Corridor Express (ACE)

ACE is a commuter rail service that connects Stockton and San José. The 86-mile route includes ten stops in three counties (San Joaquin, Alameda, Santa Clara), with a travel time of about two hours and twelve minutes. ACE operates four round trips during weekday peak hours – four morning trips to San José and four afternoon trips to Stockton. In 2017, ridership totaled over 1.2 million passengers.

When considering the western portion of the route, ACE offers a commuting alternative to I-680 from Pleasanton to San José. Between Pleasanton and Sunol, the rail right of way is directly adjacent to I-680 and often parallels the freeway. Farther south, between Sunol and San José, the route is closer to the San Francisco Bay and offset from the I-680 alignment by a few miles.

In response to growing travel demand between San Joaquin County and Bay Area job centers, a project to expand ACE service to the San Joaquin Valley via an extension from Lathrop to Ceres/Merced is in the advanced planning stage. The vision outlines near-term, mid-term, and longer-term improvements. Near-term improvements include six daily ACE round trips, initiating ACE weekend service, and the Valley Link (Dublin/Pleasanton to North Lathrop). Mid-term improvements include ten ACE daily round trips and the Valley Link extension to Stockton. Longer-term improvements include 15-minute to 30-minute frequencies, dedicated tracks (branded as “Universal Corridor”), and a one-seat-ride between major hub stations.

Valley Link

Valley Link is a proposed rail service between Dublin/Pleasanton BART Station and North Lathrop that establishes a bi-directional, all-day service, bridging the gap between ACE and BART. This project closes the gap between ACE and BART and provides a reliable alternative to congestion on I-580. This project also connects with ACE at North Lathrop to close the gap to Stockton, Sacramento, Modesto, and future HSR in Merced by connecting to the ACE system. Valley Link service is a key part of an integrated, coordinated, megaregional rail system, introducing increased frequencies, broader market reach, regular interval service, and new connectivity providing improved direct connections to BART and ACE.

Capitol Corridor

Closer to the I-880 Corridor in Alameda County, Capitol Corridor is an intercity passenger rail system with 18 stations along a 170-mile corridor in eight Northern California counties: Placer, Sacramento, Yolo, Solano, Contra Costa, Alameda, San Francisco, and Santa Clara. The Capitol Corridor service has the third-highest passenger rail corridor ridership in the entire national Amtrak system, having carried 1,560,814 passengers during FY 2016.³⁰ The top three origin and destinations along the corridor were Sacramento to Emeryville, Sacramento to Richmond, and Sacramento to Oakland Jack London Square.

³⁰ Caltrans *Interregional Transportation Strategic Plan (ITSP)*, June 2015.

The Capitol Corridor, which began service in 1991, primarily connects San José to Oakland and Sacramento, running parallel to the southern portion of the I-680 Corridor. This is one of three intercity passenger train corridors Caltrans provides the necessary funds to operate the service. Additionally, Caltrans owns the rolling stock. Since 1998, the route has been administered by the Capitol Corridor Joint Powers Authority (CCJPA). The service also provides connections to Auburn, Roseville, and San Francisco (via thruway bus service). Additionally, connections to BART service exist at the Richmond and Oakland Coliseum Stations, and a connection to Caltrain can be made in San José. As the service is recognized as a priority corridor in the Interregional Transportation Strategic Plan, there will be a focus over the next two decades to expand intercity passenger rail service to Monterey County.

CCJPA is currently working on a project that will decrease travel times between Oakland and San José, potentially providing an improved rail alternative for drivers on the southern part of I-680 to access San José. The project, South Bay Connect, will relocate Capitol Corridor service between Oakland and Newark from the Niles Subdivision to the Coast Subdivision, and will inversely relocate freight operations from the Coast Subdivision to the Niles Subdivision. Enhancements to the Coast Subdivision will include track and tie replacements, security fencing, signal upgrades and a new passing siding, and intermodal station at the Ardenwood Park & Ride. Freight enhancements could include a new connection between the Niles and Oakland Subdivisions at Industrial Parkway in Hayward and a new connection at the Shinn District in Fremont.

Local Bus

Livermore Amador Valley Transit Authority (LAVTA)

LAVTA provides local commuting services in addition to relevant express bus service (as introduced previously). Specific to the Corridor, Route 53 operates via I-680 between the Stoneridge Mall and the Pleasanton ACE Station. Route 54 operates via I-680 between the Dublin/Pleasanton BART Station and the Pleasanton ACE Station. Additionally, there are various other bus lines that operate within a couple of miles of I-680, either in crossing or parallel; these include local Routes 3 and 8, rapid Routes 10R and 30R, and school Routes 501-504, 602-604, 607, and 609.

LAVTA was also successful in receiving Transit and Intercity Rail Capital Program funding from CalSTA for a total amount of \$20,500,000 for the Dublin/Pleasanton Capacity Improvement and Congestion Reduction Program in 2018. The program proposes to increase transit ridership through construction of a new multi-level parking structure to create over 500 additional parking spaces, including prioritized vanpool parking, at the Dublin-Pleasanton BART Station.

Alameda-Contra Costa Transit District (AC Transit)

AC Transit currently covers a service area of approximately 1.5 million people in 364 square miles, including cities within Alameda and Contra Costa Counties, unincorporated areas, Downtown San Francisco (via the Bay Bridge), Foster City and San Mateo (via the San Mateo-Hayward Bridge), and Stanford and Palo Alto (via the Dumbarton Bridge). In FY 2017-2018, AC Transit accommodated approximately 169,000 daily weekday riders, over 51.7 million annual riders, and approximately 771,000 annual paratransit riders.

As part of its transit network, AC Transit does not currently operate any bus routes that travel on I-680. However, in southern Alameda County and near the border with Santa Clara County, a handful of bus lines

(Routes 210, 215, 217, and 239) cross or parallel a portion of the Corridor, within the Mission San José and Warm Springs Districts in Fremont.

Within Fremont and Newark, AC Transit is evaluating new service models that would aggregate trips to trunk routes and pilot on-demand flexible service in general areas. This has been explored in other parts of AC Transit's service areas and would be used to increase transit service in the identified Priority Development Areas of Fremont and Newark, in particular. In partnership with Alameda County Transportation Commission, AC Transit and project partners are also developing a multimodal vision for a major corridor that parallels I-680 in southern Alameda County: Mission and Fremont Boulevards. This project explores rapid bus opportunities, highlighting connections to BART and regional rail nodes.

4.2 Park-and-Ride Facilities

The Caltrans Park-and-Ride (P&R) Program facilitates access to transit and ride sharing along freeway corridors with the goal to reduce congestion and vehicle miles traveled. A mode shift away from single-occupancy vehicles helps reduce congestion, improves air quality, and helps Caltrans meet its sustainability goals. Due to the ineligibility of P&R projects for the Interregional Transportation Improvement Program (ITIP) funds and the low priority given to P&R for State Highway Operations and Protection Program (SHOPP) funds, there is little funding available for Caltrans to build or improve P&R facilities. Therefore, Caltrans is focusing on collaboration with local jurisdictions, regional and transit agencies to develop partnership opportunities to enhance, expand, and/or construct P&R facilities.

Existing P&R Inventory along I-680 Corridor

Throughout the San Francisco Bay Area, there are 150 public facilities available to commuters. Caltrans has fifty park-and-ride facilities with a capacity of 5,606 parking spaces.

Along the I-680 Corridor, there is one facility owned and maintained by Caltrans, and it is called Mission Boulevard, with a total of 127 parking spots. This lot is situated near post mile ALA 680 6.4, near SR 238. AC Transit and VTA provide transit services for passengers at this lot. This and other agency park-and-ride locations are listed in **Table 4-3**.

Also within Fremont, Mission San José Park is located along Mission Boulevard (SR 238) around post mile ALA 238 0.7. It is operated under a joint-use agreement with Caltrans, whereby the city of Fremont owns and maintains the rideshare lot. There are 22 parking spaces available at this location, along with bicycle storage lockers. AC Transit and VTA provide transit services for passengers at this lot.

The city of Pleasanton park-and-ride lot is located at the northwest corner of the intersection between Stoneridge Drive and Johnson Drive near post mile ALA 680 19.3. There are 83 parking spaces and five motorcycle parking spaces available at this facility, along with bicycle racks and a bus shelter.

Slightly north of the Alameda County border with Contra Costa County, the Bollinger park-and-ride lot, found within San Ramon, is located in the southwest quadrant of the I-680/Bollinger Canyon Road Interchange (PM CC 680 2.8). There are 108 parking spaces at this facility.

Table 4-3. Park-and-Ride Facilities, 2018

Lot Name	County	Route	Location	Parking Spaces	Occupancy
Mission Boulevard	ALA	680	Southeast quadrant Mission/I-680	127	90.6%
Mission San José Park	ALA	238	0.7 miles west of I-680 on SR 238	22	n/a
City of Pleasanton	ALA	680	Stoneridge and Johnson Drives	83 + 5 motorcycle	n/a
Bollinger	CC	680	Bollinger Canyon Road and I-680	108	n/a

In addition, there are three multimodal transit stations within the Corridor in Santa Clara and Alameda Counties that provide additional lots.

- West Dublin/Pleasanton BART Station (BART and local bus lines, bicycle parking)
- Johnson Park-and-Ride at Stoneridge and I-680 (local bus line)
- Warm Springs BART (BART, local bus lines, bicycle parking)

Planned Park-and-Ride Facilities in the I-680 Corridor

Caltrans has one new park-and-ride project included in the Ten-Year SHOPP Plan that is within the I-680 Corridor. The City of Pleasanton is exploring options to build a lot at I-680 and Bernal Avenue. These planned and proposed projects are listed in **Table 4-4**.

Table 4-4. Planned Park-and-Ride Facilities

Organization	Route	Post Mile	Location	Program Year	New Parking Spaces
Caltrans	680	ALA 0.1	Scott Creek Road	2024	367
AlaCTC/Pleasanton	680	ALA R16.7	Bernal Avenue	TBD	~200

4.3 Private Commuter Shuttle Services

As job growth in the Bay Area outpaces housing growth in recent years, the imbalance between housing and jobs has increased, resulting in longer commutes and significantly more traffic congestion. Private commuter shuttles (Shuttle), which have been in operation since 2004, are the private sector’s response in the San Francisco Bay Area.³¹ A Shuttle operator essentially provides a direct, private transit service from multiple pick-up locations to an employer’s company campus. Companies primarily select shuttle pick-up locations based on high density clusters of employee residences, and transport employees to and from work each day on a regular schedule. The Shuttle route can change over time with the location of the employee residences clusters. The Shuttle services are typically operated either by private charter bus companies in contract with a sole employer, by the employer directly, or by third parties working with bus companies to serve multiple employers.

Within Alameda CTC’s 2017 *Tri-Valley Integrated Transit and Park-and-Ride Study*, a couple of key findings from the existing conditions assessment included that park-and-ride lots in Dublin and Pleasanton are mostly used for private employer shuttles, and the largest concentration of private employer shuttle use is from the Alameda County Fairgrounds (this location was not formally part of the study).

³¹ *Policy Analysis Memo to City and County of San Francisco Board of Supervisors*, March 2014.

Table 4-5 presents a list of the employer shuttles that were identified at existing ACE stations and park-and-ride lots in 2017. Based on the distance from the study area to the employment sites served, it was estimated that the average trip distance for employer shuttles is about 36 miles each way.

Table 4-5. Tri-Valley Private Shuttle Inventory as of 2017

Lot	Location	Private Employer Shuttles	Destination City
Pleasanton ACE Station	Pleasanton	Clorox	Pleasanton
		Safeway	Pleasanton
		Thermo Fisher	Pleasanton
		Other Unidentified Shuttles	Various
Vasco Road ACE Station	Livermore	Lawrence Livermore National Lab	Livermore
East Airway Boulevard PNR	Livermore	Amazon	Sunnyvale
		Genentech	South San Francisco
Johnson & Stoneridge PNR	Pleasanton	Tesla	Fremont
		Uber	San Francisco
Portola PNR	Livermore	E&J Gallo Winery	Modesto
Tassajara (Dublin Corporate Center) PNR	Dublin	Amazon	Sunnyvale
		Facebook	Menlo Park
		E&J Gallo Winery	Modesto
		Genentech	South San Francisco
		GoPro	San Mateo
		Netflix	Los Gatos
		Visa	Foster City, San Mateo
		Yahoo	Fremont, Sunnyvale, San José
		Other Unidentified Shuttles	Various

Source: Alameda CTC Tri-Valley Integrated Transit and Park-and-Ride Study 2017

4.4 Bicycle and Pedestrian Facilities

Policy Overview: District and Countywide Plans

Pursuant to the Complete Streets policies, Caltrans has developed the District 4 Bike Plan and is currently working on the Pedestrian Plan. In addition, each county along the I-680 Corridor has adopted their own bicycle and/or pedestrian plan(s), outlining the policy goals as well as identifying pedestrian and bicycle needs within the county.

Caltrans District 4 Bike Plan

The Caltrans District 4 Bike Plan (2018), evaluates bicycle needs on and across the Bay Area's State transportation network and identifies infrastructure improvements to enhance bicycle safety and mobility and by removing barriers to bicycling in the region. This Plan complements and builds on statewide, regional, and local planning efforts to help create a connected, comfortable, and safer bicycle network for the Bay Area. The Bike Plan provided a needs analysis and identified priority improvements. The needs analysis is based on multiple data sources to rank highway segments on Level of Traffic Stress (LTS), low stress connectivity (permeability), collision history, and potential bicycling demand. Improvements are classified by prioritization categories of top, mid, and low tiers. Recommended projects along the I-680 Corridor from the Bike Plan are included in Chapter 7.

Caltrans District 4 Pedestrian Plan

Caltrans District 4 is currently developing a Pedestrian Plan. The Pedestrian Plan will complement the Bike Plan and will identify and prioritize pedestrian needs on and across the State Transportation Network in the Bay Area.

Alameda CTC Countywide Active Transportation Plan

The Alameda Countywide Active Transportation Plan (CATP) provides a vision, goals, and priorities to improve walking and biking throughout the jurisdictions in the County. The CATP identified the Countywide High Injury Networks for Bikes and Pedestrians as the top 20 percent of the roadway segments in the County where most of the high injury and fatal accidents for these modes occurred. The CATP was developed to establish countywide priorities that further local agencies' efforts to enhance walking and biking for all County residents.

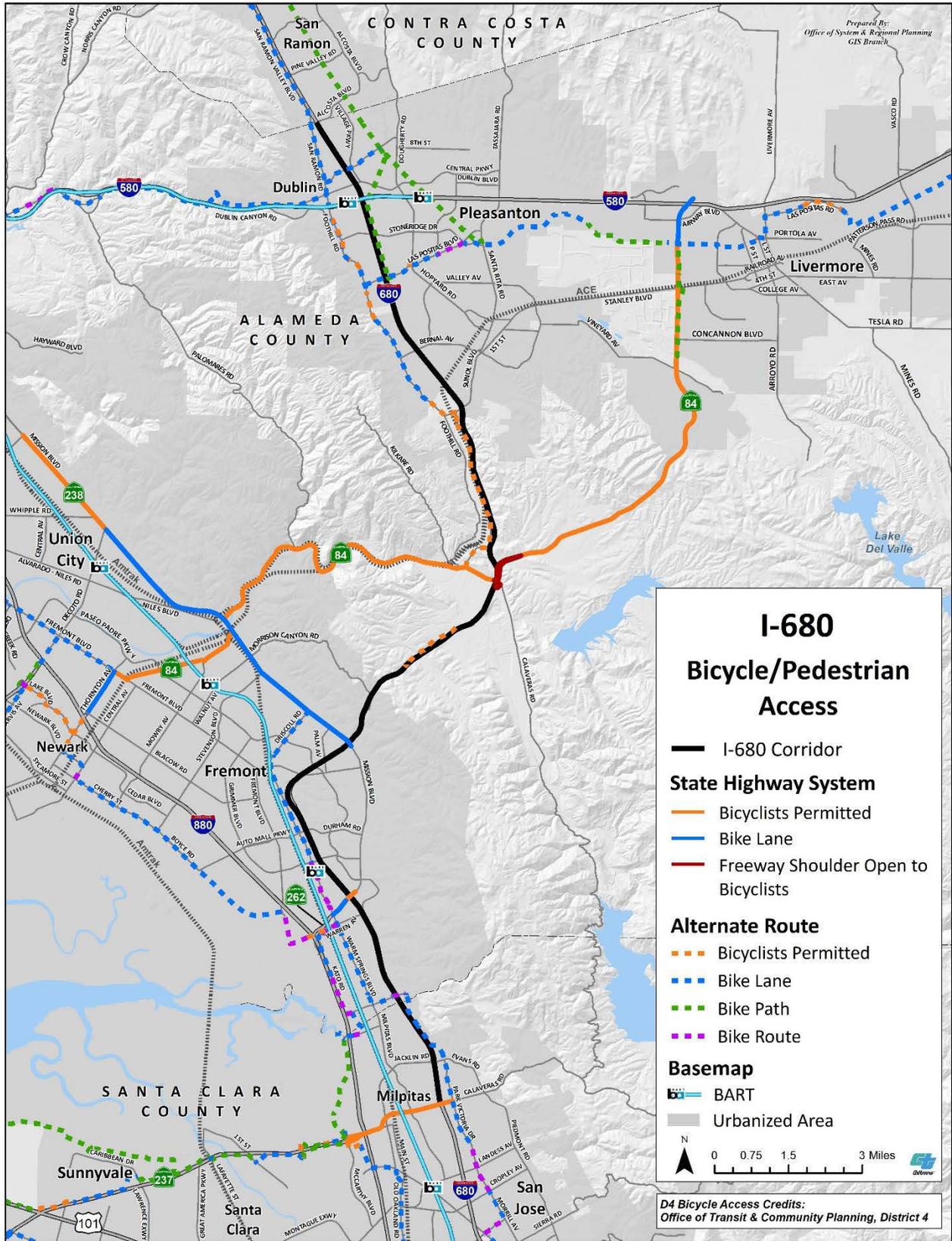
Santa Clara Countywide Bicycle Plan

The vision for the Santa Clara Countywide Bicycle Plan³² is “to establish, protect and enhance bicycling as a viable transportation mode and to assure that bicycling is a practical and safe mode of travel, by itself and in combination with other modes.” This vision is to be achieved by closing gaps, implementing Complete Streets, a steady funding source, and planning and coordination. VTA adopted the Countywide Bicycle Plan in May 2018.

Figure 4-2 shows major bicycle facilities on the State Highway System as well as the nearest parallel facilities when bicycles are not permitted on a State highway.

³² <http://www.vta.org/sfc/servlet.shepherd/version/download/068A0000001FZYt>

Figure 4-2. Major Bicycle Facilities in the vicinity of I-680 Corridor



Source: Caltrans, District 4, GIS and Technical Support Branch, 2019

Pedestrian and Bicycle Facility Needs and Projects

Caltrans has endorsed pedestrian and bicycle oriented design in various guidelines and standards such as Design Information Bulletin (DIB) 84³³, the Highway Design Manual³⁴, the Complete Intersections: A Guide to Reconstructing Intersections and Interchanges for Bicyclists and Pedestrians (2010)³⁵, and National Association of City Transportation Officials (NACTO) Urban Bikeway Design and Urban Street Design Guides.³⁶ The following strategies represent general best-practice that could be implemented along the corridor to ensure the safety of bicyclists and pedestrians and provide connections for multi-modal travel.^{37, 38} The combined bicycle and pedestrian project list is included in Chapter 7 Recommended Strategies. These projects are based on the D4BP, Countywide active transportation plans in Santa Clara and Alameda Counties and local active transportation plans.

- Complete Streets Strategies:
 - Reconstruct ramps to intersect crossroad at 90-degree angle with as small a radius as possible and install a stop or signal control
 - Encourage slower vehicle speeds until past ramp entry
 - Limit on-ramps to a single-entry lane, where feasible
 - Provide single, rather than dual, right-turn only lanes, or minimize conflicts where dual right turn lanes are needed
 - If a dual right-turn only lane is needed, channelize it and split into two separate movements
 - Widen sidewalks and shoulders to standard widths, with in general the minimum being five feet and four feet, respectively
- Pedestrian-Specific Strategies:
 - Locate crosswalks appropriately, considering speed, sight lines, and crossing distance
 - Leading Pedestrian Interval
 - Shorten crossing distance
 - Install pedestrian warning signs, yield signs, pedestrian-actuated beacons, and high-visibility crosswalks where crossings are uncontrolled or yield-controlled
 - Provide sidewalks on both sides of overcrossings and undercrossings, where feasible
 - For ramp crossings, add pedestrian signals, coordinated with adjacent traffic signals
 - Install accessible pedestrian signals
 - Lighting at uncontrolled crossings, pedestrian scaled lighting
 - Provide “no right-turn on red” signs where there are two right turn-lanes and a pedestrian crossing
- Bicycle-Specific Strategies:
 - Provide context sensitive bicycle facilities on all roads crossing 680, including those through interchanges. Ensure the quality of the bicycle facility is maintained or improved through the interchange.

³³ <http://www.dot.ca.gov/design/stp/dib/dib84-01.html>

³⁴ <http://www.dot.ca.gov/design/manuals/hdm.html>

³⁵ https://nacto.org/docs/usdg/complete_intersections_caltrans.pdf

³⁶ <https://nacto.org/2014/04/11/california-officially-endorses-nacto-urban-street-design-guide-and-urban-bikeway-design-guide/>

³⁷ <https://altaplanning.com/wp-content/uploads/Complete-Intersections-A-Guide-to-Reconstructing-Intersections-and-Interchanges-for-Bicyclists-and-Pedestrians.pdf>

³⁸ <http://www.divergingdiamond.com/>

- If interchange is signalized, ensure signal timing takes into consideration adequate bicycle crossing time through interchange.
- Provide a bicycle pocket or bike lane to the left of dedicated right turn lanes or a Class IV separated bikeway to the right with a protected crossing
- Widen/add buffers to existing and proposed bike lanes, minimum width 18 inches

4.5 Transportation Systems Management and Operations

Caltrans is committed to effective TSMO to optimize the performance of California's transportation systems for all users and modes of travel. Successful TSMO requires proactive integration of the transportation systems to efficiently move people and goods along highly congested urban corridors. Examples of TSMO strategies include, but are not limited to, ramp metering, traffic signal synchronization, Intelligent Transportation Systems/Traffic Operations Systems (ITS/TOS), and managed lanes. Efficiency can often be achieved by operational improvements through ITS deployments. These include four types of management for improving throughput:

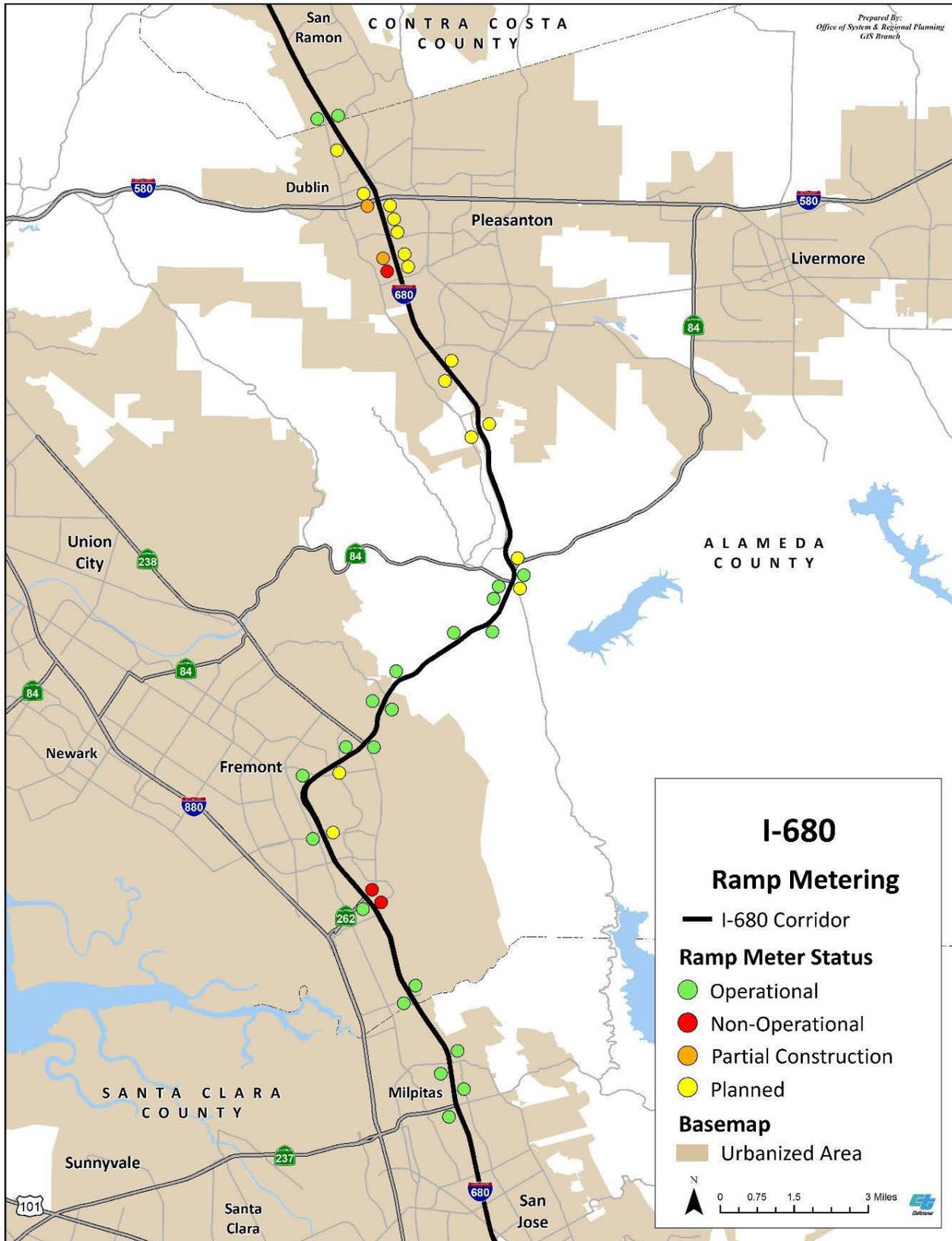
- System management for recurring localized congestion (ramp metering, managed lanes, traveler information, dynamic speed limits, traffic signals and transit priority, parking management system, automated vehicles).
- Incident management for non-recurrent congestion (detection-verification-response, closed-circuit television (CCTV), changeable message signs (CMS), highway advisory radio (HAR), weather detection, traveler information system).
- Event management for emergencies, disasters and other occurrences (through system monitoring, evacuation management, route selection).
- Asset Management for managing existing infrastructure and other assets to deliver an agreed standard of service. One of the first steps in the efficient management of the transportation system will be the completion and implementation of a Transportation Asset Management Plan.

As TSMO strategies are developed and implemented, additional ITS/TOS elements within the Corridor are often required. Caltrans Strategic Management Plan 2015–2020 has as Strategic Objective to “effectively manage transportation assets by implementing the asset management plan and embracing a fix-it-first philosophy.” The plan specifies a target of maintaining ninety percent or better ITS/TOS element health by 2020. Operations and maintenance (O&M) resources are essential to achieve this fix-it-first target. As more ITS/TOS elements are implemented, O&M resource needs will continue to grow.

Ramp Metering and Other ITS/TOS Elements

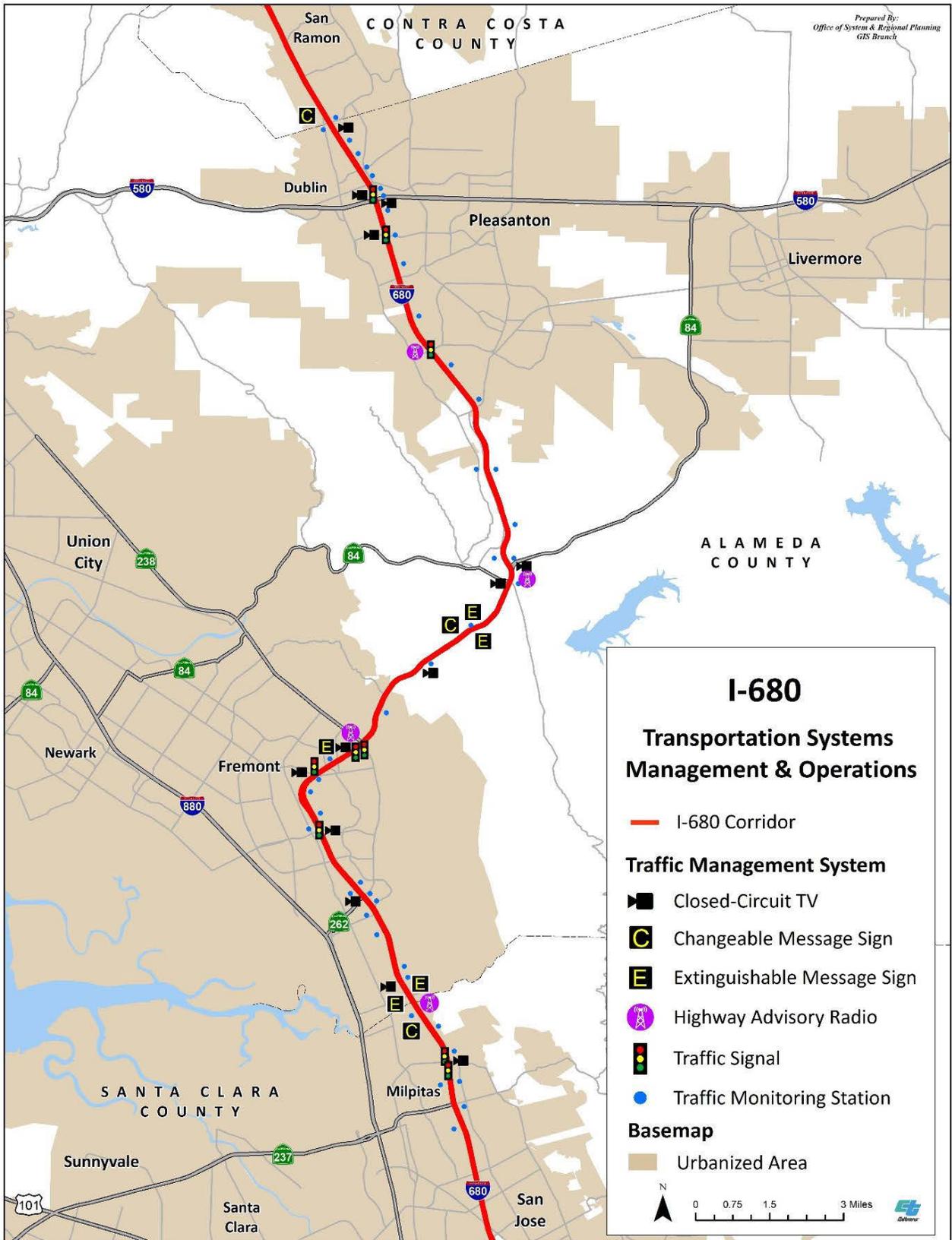
As required by Caltrans Deputy Directive DD-35-R1 Ramp Metering, each District that currently operates, or expects to operate ramp meters within the next ten years, shall prepare a District Ramp Metering Development Plan (RMDP). The RMDP contains a list of ramp metering locations currently in operation or planned for operation in the next ten years. According to the 2017 RMDP, District 4 has 734 existing and/or programmed ramp meters and 561 planned ramp meter projects as of October 2017. **Figure 4-3** on the next page shows operational, non-operational, partially constructed and planned ramp metering locations along the I-680 Corridor. **Figure 4-4** shows Traffic Management System element locations along I-680.

Figure 4-3. I-680 Ramp Metering Locations



Source: Caltrans, District 4, GIS and Technical Support Branch, 2019

Figure 4-4. I-680 TMS Locations



Source: Caltrans, District 4, GIS and Technical Support Branch, 2019

4.6 Broadband

California Governor's Executive Order S-23-06 Twenty-first Century Government established the California Broadband Task Force, consisting of Caltrans and other public and private stakeholders, to identify opportunities to facilitate broadband installation across the State. Assembly Bill 1549 of 2016 requires Caltrans to notify broadband deployment organizations on construction methods suitable for broadband installation to bring together private and public partnership for opportunities to increase advanced communication technologies. Caltrans developed the *Incorporating Wired Broadband Facility on State Highway Right-of-Way User Guide*, providing guidelines for wired broadband providers about Caltrans processes to incorporate wired broadband facilities in State Highway right-of-way.

In 2018, CTC's Comprehensive Multimodal Corridor Plan Guidelines identify the need to install conduit along certain California State Highways for future deployment of broadband fiber to service the needs and demands of a wide range of users. The California Advanced Services Fund (CASF) funded 17 regional broadband consortia across the state to identify "Strategic Broadband Corridors" that should become part of future Caltrans planning in an effort to provide broadband services to areas currently without broadband access and to build out facilities in underserved areas.

I-680 is among the proposed strategic broadband corridors recommended by the regional broadband consortia. See **Figure 4-5** for a map of strategic broadband corridors.

MTC's Regional Communications Strategic Investment Plan

Building on the strategies to enhance the regional communications network outlined in previous iterations, the 2013 Bay Area Regional Communications Plan factored in additional programs (Express Lanes, Integrated Corridor Management, Freeway Performance Initiative), and consider new priorities from local and regional stakeholders throughout the Bay Area. This Plan introduced a "Regional Communication Fiber Ring" around the San Francisco Bay, aimed to reduce lease-line recurring costs, upgrade existing infrastructure and share data among agencies.

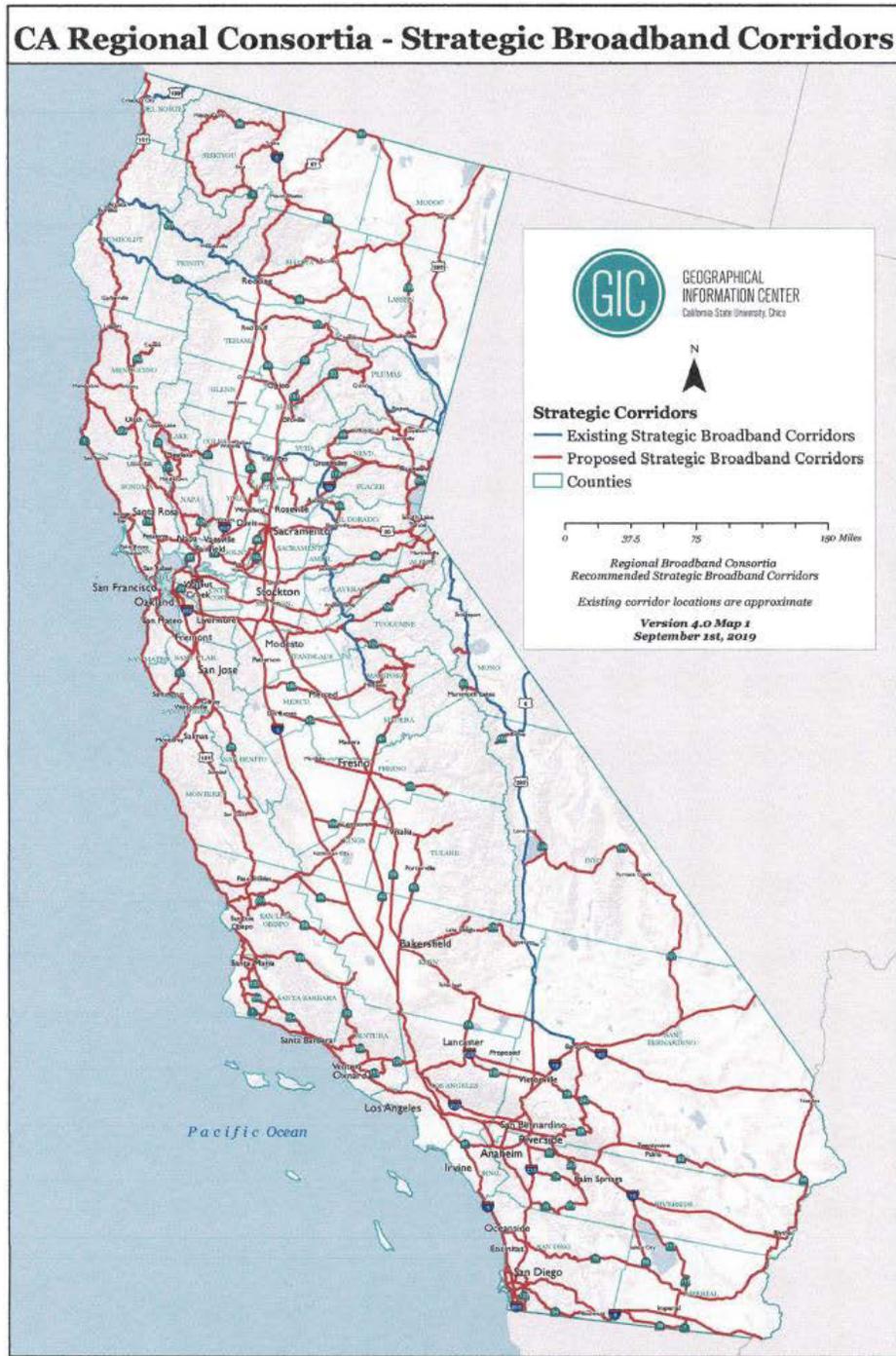
The Bay Area Regional Communications Plan is currently being updated to create a Regional Communications Strategic Investment Plan. This plan will propose projects and create a roadmap for future investments. It will enable MTC, Caltrans, and other regional stakeholders to develop a regional communications network that can potentially support future broadband deployment in the Bay Area. The proposed "fiber ring" includes US 101, I-80, I-580, I-880 and other priority corridors. I-680 between SR 262 and I-580 is identified as a candidate for future implementation beyond the initial phases.

Regional Communications Infrastructure

The existing regional communications infrastructure includes the following components:

- Seventeen Bay Loop Microwave sites owned and operated by the Bay Area Regional Interoperable Communications Systems Authority (BayRICS)
- BART fiber communications infrastructure along their right-of-way throughout the Bay Area. Caltrans has sixteen access points to BART fiber strands. San José, San Francisco, Oakland, and Dublin also have connections to BART fiber communications infrastructure.

Figure 4-5. Strategic Broadband Corridors



Sub-Regional Communications Infrastructure

There is also sub-regional infrastructure found within the I-680 Corridor. Existing communication infrastructure along I-680 is found between I-580 and the Contra Costa County line (Caltrans/BAIFA).

In addition to the existing infrastructure, future transportation projects such as express lanes projects may also offer opportunities to help support broadband expansion. See Chapter 7 for future transportation projects within the Corridor.

4.7 Transportation Demand Management

Transportation demand management (also known as TDM) is a broad application of projects and strategies aimed at reducing travel demand or shifting the demand to other modes, routes, or times.

Policy and program - driven projects include:

- Alternative mode travel incentives
- Carpool/vanpool incentives
- Subsidized transit passes
- Parking management programs
- Guaranteed ride home programs
- Alternate mode trip planning websites and applications

TDM can also include infrastructure and operational projects, including but not limited to HOV/express lanes, bicycle parking, park-and-ride lots (see 4.2), and Complete Street treatments on local streets.

TDM Examples

Regionwide, efforts are being implemented in support of TDM initiatives, encouraging the use of alternative modes. These consist of:

- The Bay Area Commuter Benefit Program
 - Program which requires employers with 50 or more full-time employees to register and offer commuter benefits to their employees, including a pre-tax benefit, employer subsidy, employer-provided transit, or an alternative benefit
 - MTC and Bay Area Air Quality Management District are leading the effort to ensure this program becomes permanent
- The 511 Rideshare Program
 - Program supports travelers in the Bay Area by providing information and incentives for ridesharing, including pairing riders in static carpools and vanpools, and promoting a select group of qualifying private sector carpool matching smartphone applications

In Alameda County, Alameda CTC takes into consideration TDM in its planning efforts. For example, planning for multimodal transportation infrastructure and services is considered in the County Transit Plan, Multimodal Arterial Plan and Goods Movement Plan. There are TDM programs in place such as the Guaranteed Ride Home (GRH) Program and the Safe Routes to School (SR2S) Program. There are also corridor-specific promotional programs for the I-580 Express Lane Corridor, the I-680 Express Lane Corridor and the I-80 SMART Corridor. Furthermore, Alameda CTC supports local governments in their TDM efforts, and monitors compliance with the required program as part of the TDM Element in Alameda CTC's Congestion Management Program (CMP).

4.8 Freight Network, Facilities and Trip Generators

I-680 is a primary access route between Silicon Valley, the East Bay, and the Central Valley (via I-580 and I-80). It connects to the Norman Y. Mineta San José International Airport via I-880 and US 101 and is used for intraregional goods movement. To the north, I-680 is a major connecting route for the Port of Benicia and I-80.

I-680 is identified on the federally-designated National Highway Freight Network (NHFN) as a ‘Primary Highway Freight System (PHFS) Interstate from US 101 in Santa Clara County to I-580 in Alameda County. North of I-580, the route is identified as a Non-PHFS Interstate. The NHFN consists of the following elements: PHFS, portions of the Interstate System not part of the PHFS (Non-PHFS Interstates), Critical Rural Freight Corridors (CRFCs), and Critical Urban Freight Corridors (CUFCs). The route in its entirety is part of the STAA National Network.³⁹ The State is committed to a broader, long-term vision for accelerating the transition of California’s multimodal freight system from its already robust stature, to a safer, more efficient and reliable, and less polluting freight system. California Freight Mobility Plan 2020, to be approved in 2020, responds to these needs through various initiatives and contains an extensive set of projects.

As referenced in the 2016 Alameda County Goods Movement Plan, improvements to the I-580/I-680 Interchange should be a priority due to the level of truck volumes, delays, and, most importantly, safety issues. Furthermore, as outlined in the Goods Movement Plan’s accompanying appendices, strategies to improve goods movement include the identification of potential project alternatives to reduce PM travel time delay along I-680 near Fremont, in addition to various enhancements to adjacent and connecting roadways – Santa Rita Boulevard, Auto Mall Parkway, and State Route 262 – that will support freight mobility.

Table 4-6. I-680 Truck Traffic Data 2016

	US 101 – SR 84	SR 84 – Alcosta Blvd	Alcosta Blvd – SR 4
Total Average Annual Daily Truck Traffic (AADTT)	13,409	13,072	10,655
Total Truck Share (% of AADT)	9.0	7.6	6.38
5+ Axle AADTT	8,368	7,412	4,296
5+ Axle Trucks Share (% of AADTT)	62.0	57.0	40.0

Source: Caltrans Traffic Census, 2016

As shown in **Table 4-6**, 2016 truck traffic accounts for nine percent of traffic between US 101 and SR 84, the highest truck percentage within the Corridor, and 62 percent of those trucks have five or more axles. These percentages drop only slightly for truck traffic between SR 84 and Alcosta Boulevard in Dublin, just

³⁹ According to FHWA, the National Network was authorized by the Surface Transportation Assistance Act of 1982 (P.L. 97-424) and specified in the U.S. Code of Federal Regulations (23 CFR 658) to require states to allow conventional combinations on "the Interstate System and those portions of the Federal-aid Primary System ... serving to link principal cities and densely developed portions of the States ... [on] high volume route[s] utilized extensively by large vehicles for interstate commerce ... [which do] not have any unusual characteristics causing current or anticipated safety problems." Conventional combinations are tractors with one semitrailer up to 48 feet in length or with one 28-foot semitrailer and one 28-foot trailer, and can be up to 102 inches wide. https://ops.fhwa.dot.gov/freight/infrastructure/national_network.htm.

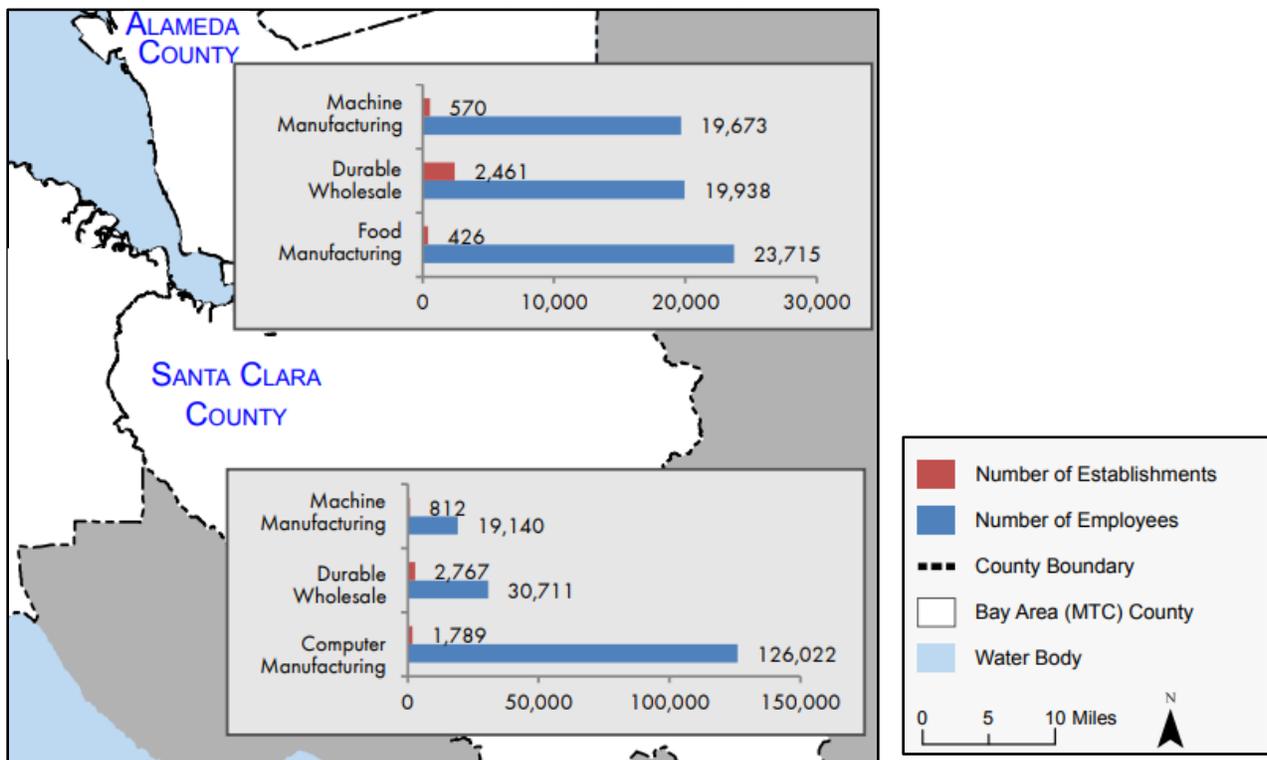
north of I-580. The share of truck traffic north of Alcosta Boulevard drops further but remains high in absolute numbers.

Figure 4-6 helps show how Alameda and Santa Clara Counties contain extensive manufacturing industries vital for California and the national economy. In Fremont, home to nearly 30,000 manufacturing jobs includes Tesla, Inc. (electric vehicles), Oorja (methanol fuel cells), Boston Scientific (medical devices), contract manufacturers such as Plexus and Pantronix, and electronics companies like Western Digital Corporation and Lam Research. In Milpitas, where more than 20 percent of the City’s workforce is employed in the manufacturing sector, innovative contributors include KLA-Tencor, Flextronics International, TDK, Micron, and Cisco.

Other major establishments in the region that rely on I-680 consist of the Lawrence Livermore National Laboratory in Livermore, healthcare facilities (Valley Care Health System in Livermore and Washington Hospital Healthcare in Fremont), and large shopping outlets (Great Mall Outlet in Milpitas and Stoneridge Shopping Center in Pleasanton).

Furthermore, the proposed Priority Production Areas (PPAs) discussed in Section 3.6 will likely generate freight demand as development progresses.

Figure 4-6. Top Three Goods Movement Industries by Employment by County



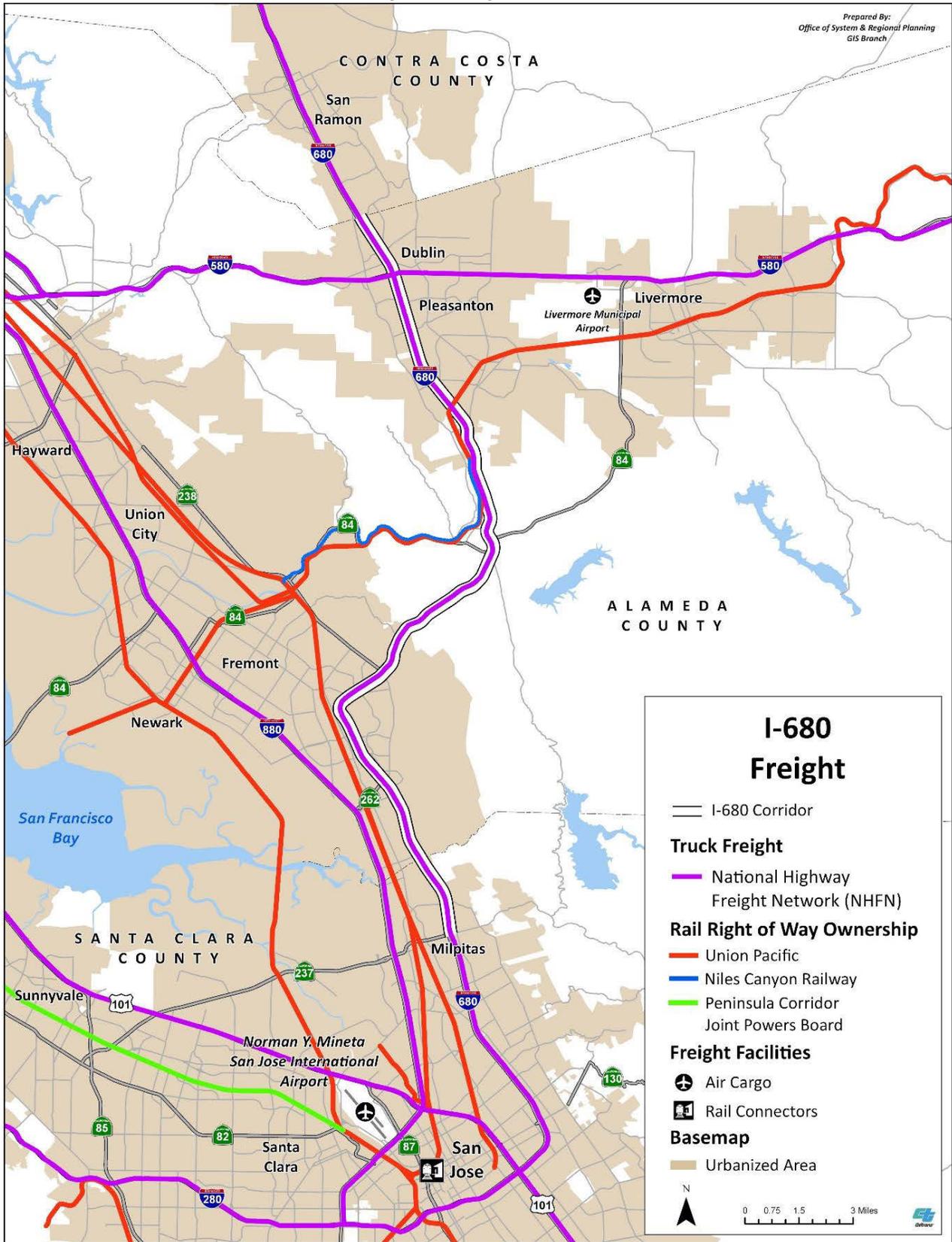
Source: Dun & Bradstreet Business Establishment Data, 2014

I-680 is included in the 2016 San Francisco Bay Area Goods Movement Plan produced by MTC. The document lists I-680 as a major goods movement route in the Bay Area, functioning as a global gateway and intraregional corridor, traversing several counties (Santa Clara, Alameda, Contra Costa and

Solano) and accommodating key elements such as the Port of Benicia and Valero Oil Refinery. I-680 serves trucks moving from the South Bay and Fremont, connecting to and from the warehouses and distribution centers in the San Joaquin Valley via I-580. I-680 is also included as one of the “regionally significant freight routes” recommended for the scoping of new improvement projects to address identified truck delay, truck reliability, and truck safety issues.

The route is also part of the study called Northern California Megaregion Goods Movement Study by MTC, with support from Caltrans, the San Joaquin Council of Governments (SJCOG), the Sacramento Area Council of Governments (SACOG) and the Association of Monterey Bay Area Governments (AMBAG). The mega-region contains many goods movement clusters (also known as freight-dependent industries), and I-680 is critical in connecting the Bay Area to the Central Valley (via I-580 and I-80) and to the Monterey Bay Area (via US 101). **Figure 4-7** shows delays on major Bay Area highway corridors. **Figure 4-8** shows freight facilities with the I-680 Corridor.

Figure 4-8. Freight Facilities



Source: Caltrans, District 4, GIS and Technical Support Branch, 2019

Chapter 5: Freeway Performance

5.1 Existing Conditions

The existing conditions for the I-680 Corridor were derived from the following reports:

- *Southbound I-680 Express Lane Performance Evaluation – An After Study (June 2013)*. The study limits are southbound from Niles Boulevard (ALA, I-680, PM R11.06) to just south of SR 237 (SCL, I-680, PM M7.4).
- *Final Draft Traffic Operations Analysis Report (TOAR) for I-680 Northbound (SR 237 to SR 84) Express Lane Project (October 2013)*. The study limits are from south of SR 237 (SCL, I-680, PM M7.4) to Alcosta Boulevard (CC, I-680, PM 0.1).
- *The I-680 Data Collection Summary (August 2017)*. The study limits are northbound from (south of) Grimmer Boulevard (ALA, I-680, PM M3.38) to north of SR 84 (ALA, I-680, PM R12.9), and southbound from (north of) SR 84 (ALA, I-680, PM R12.9) to SR 237 (SCL, I-680, PM M7.4).
- *Draft Traffic Operations Analysis Report for I-680 Express Lanes from State Route 84 to Alcosta Boulevard (March 2019)*. The study limits are in northbound direction from Washington Boulevard (ALA, I-680, PM M5.31) to Bollinger Canyon Road (CC, I-680, PM R2.89), and in southbound direction from Bollinger Canyon Road to Sheridan Road (ALA, I-680, PM R8.31).

These reference documents are pertaining to different phases of the I-680 Express Lanes, some of which are operational or being developed while others are planned for the future. Therefore, data coverage and collection methodology may not always be consistent between documents. This is an inherent limitation of the hybrid approach used to create this CMCP. Where data gaps exist, Caltrans Traffic Census, INRIX and Traffic Accident Surveillance and Analysis System-Transportation Systems Network (TASAS-TSN) were used to bridge the gaps to the extent feasible to provide a general assessment of the freeway performance and to complement existing project reports and studies.

Segment 1

This section documents the existing conditions of Segment 1 of the I-680 Corridor from SR 237 in Santa Clara County to SR 84 in Alameda County.

This segment of I-680 is a full access-controlled freeway. North of SR 237, the freeway consists mostly of three general purpose (GP) lanes in each direction but contains sections with four GP lanes as well. Additionally, one express lane (EL) in the southbound direction is found between SR 84 and SR 237. There is currently no managed lane in the northbound direction, but construction of Phase I of the northbound express lane between Auto Mall Parkway and SR 84 began in 2018, with expected completion date of Fall 2020. Phase II between the Santa Clara County line and Auto Mall Parkway is planned for the future.

Traffic Volume, Mode Share and Truck Volume

According to the I-680 Data Collection Summary, within Segment 1, northbound daily mainline volume ranged from approximately 57,000 to 72,000, while southbound daily mainline volume ranged from approximately 63,000 to 86,000 in 2017. Existing southbound express lane between SR 84 and SR 237 also carried up to 11,000 vehicles per day. Around 65 percent of the express lane users were single (paying) commuters during the morning commute, while this number dropped to around fifty percent during the

evening commute. Overall, vehicles with two or more passengers accounted for about twelve to 26 percent of the total traffic, depending on location and time of day, with southbound having a higher percentage than northbound. This is possibly because of the availability of the southbound managed lane.

Caltrans Traffic Census data, as shown in **Table 5-1**, confirms the mainline volumes found in the I-680 Data Collection Summary. Caltrans data also shows a range from almost five to nine percent for trucks as a share of the Annual Average Daily Traffic (AADT) for Segment 1.

Table 5-1. 2016 AADT and Truck Percentage

County	I-680 Post Miles	Location	2016 AADT Volumes	Trucks of Total Traffic	Trucks Five or More Axles
SCL	M7.65	SR 237	146,000	4.6 %	55 %
ALA	M2.38	SR 262	149,000	9.0 %	62 %
	R6.4	SR 238	148,000	4.8 %	47 %
	R11.04	SR 84	147,000	7.6 %	58 %

Source: Caltrans Traffic Census Database <http://www.dot.ca.gov/trafficops/census/>

Freeway Congestion

MTC’s Vital Signs report ranks northbound I-680 from Scott Creek Road in Fremont to Andrade Road in Sunol as the fourth most congested segment in the Bay Area in 2018. Other congested segments on I-680 listed in the Top 50 Congested Locations are in the southbound direction from Capitol Expressway extending beyond I-680 including the US 101 Interchange in San José (ranked 17), and in the southbound direction between SR 237 and Berryessa Road (ranked 27), both beyond the limits of the Corridor.

Figure 5-1. INRIX Speed Contour Maps I-680 from SR 237 to SR 84, March 2015

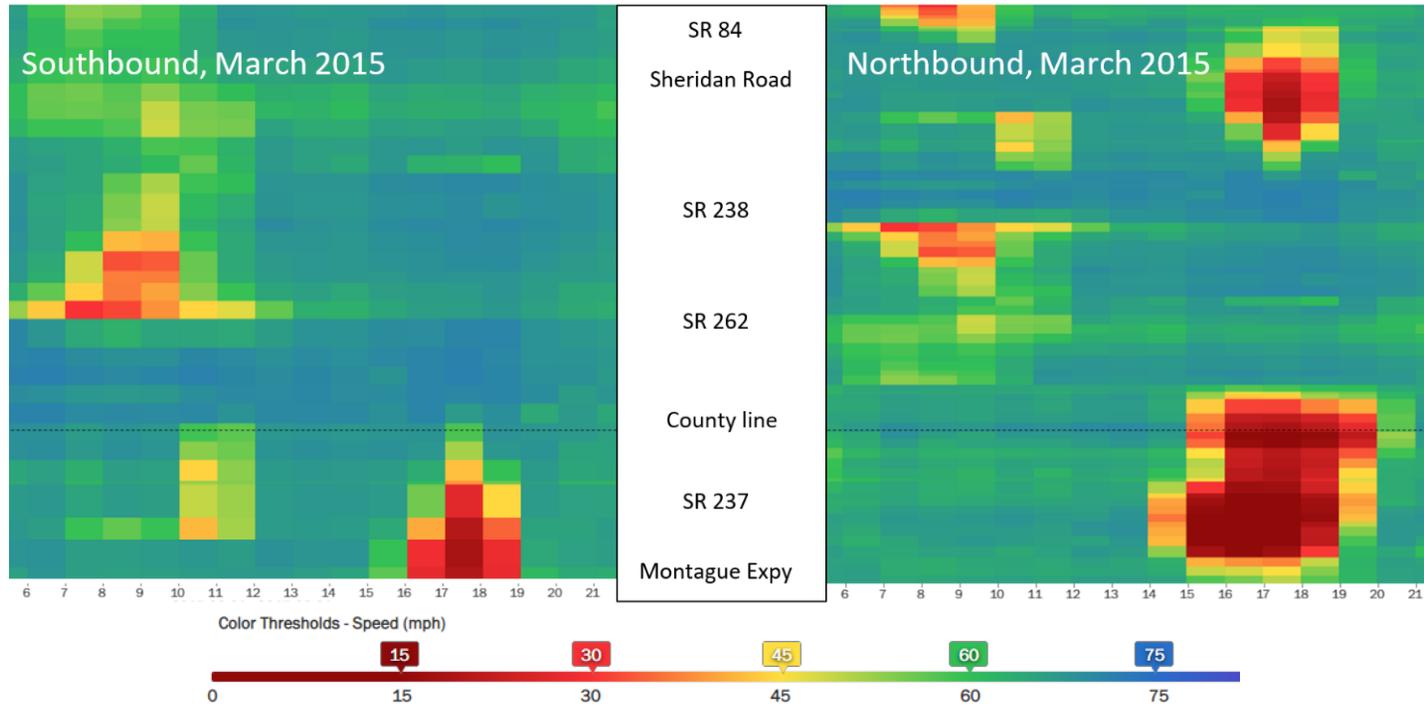


Figure 5-2. INRIX Speed Contour Maps I-680 from SR 237 to SR 84, March 2019

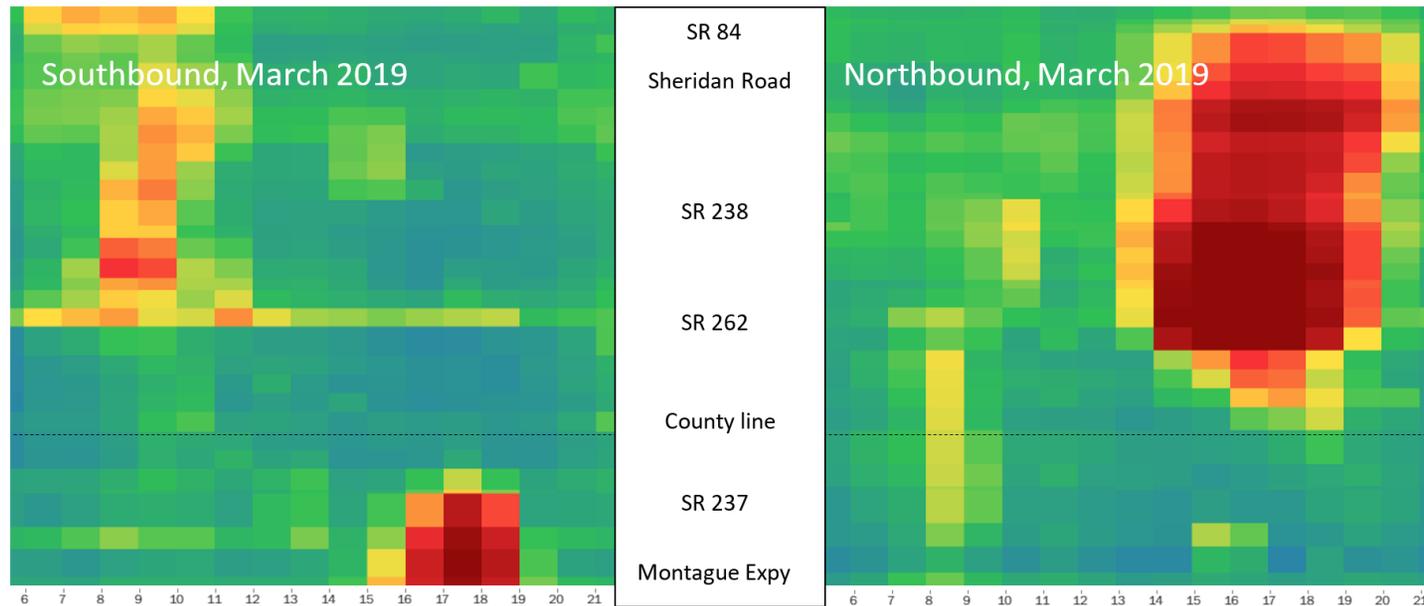
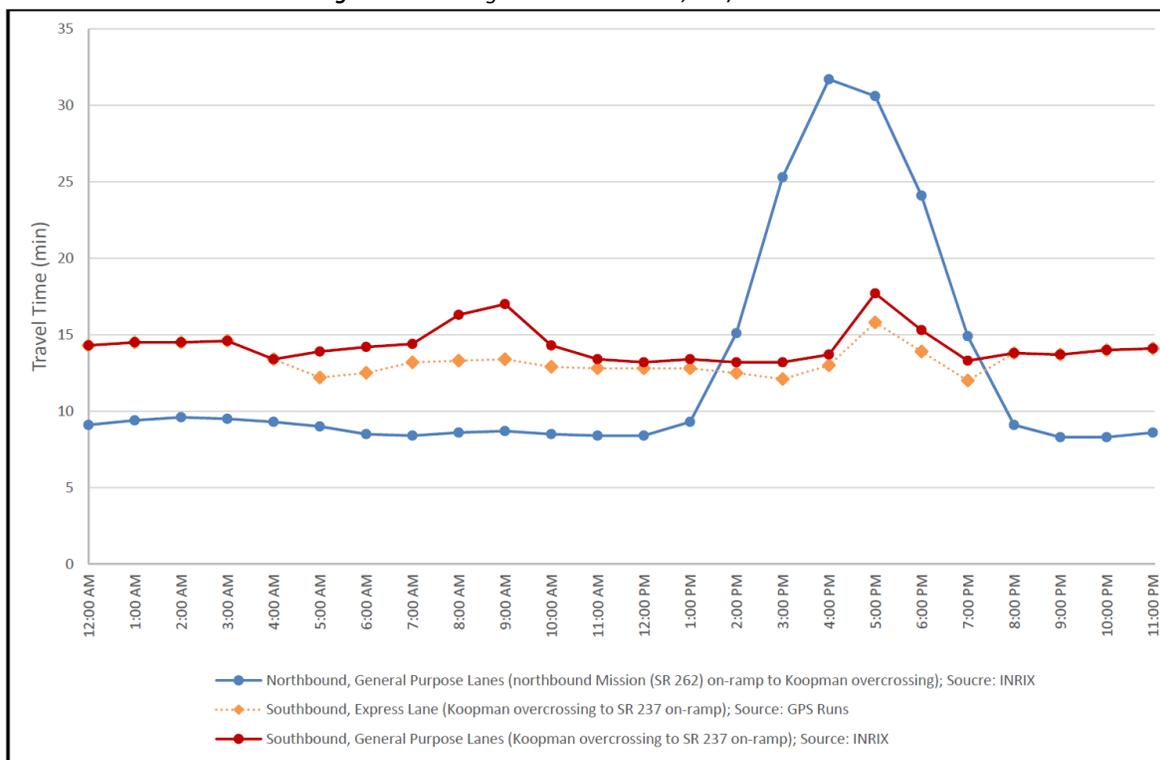


Figure 5-1 and **Figure 5-2** are INRIX speed contour maps showing travel speed from 6 AM to 9 PM for March 2015 and March 2019, respectively.⁴⁰ In the southbound direction, congestion is observed north of SR 262 during AM peak period and near SR 237 and south during PM peak period. Congestion at both locations grew from 2015 to 2019. South of the Alameda/Santa Clara County line, a 2015 congestion area (10 AM to 12 PM) did not recur in 2019. One possible explanation is that more drivers chose I-880 or parallel local arterials in the southbound direction during mid-morning hours as a result of various improvements to these alternative routes. Additionally, app-based tools like Waze became more widespread during this same time-period which is also likely contributing to more traffic on local roads.

In the northbound direction, congestion patterns in 2019 are noticeably different than they were in 2015. While much congestion occurred south of the county line in 2015, it has moved further north into Alameda County and merged with the congestion starting at SR 84 in 2019.

Similarly, this northbound congestion is confirmed by Caltrans Performance Measurement System (PeMS) Travel Time data as provided in the I-680 Data Collection Summary. Compared to the free flow conditions, northbound travel time more than tripled during afternoon and evening commute between SR 262 and just north of SR 84 in 2017. This occurred before the construction of the northbound express lane Phase I began. **Figure 5-3** shows the average travel time on I-680 during February and March 2017.

Figure 5-3. Average Travel Time I-680, Feb/March 2017



Source: I-680 Data Collection Summary, August 1, 2017, Exhibit 3, page 11.

⁴⁰ Data from INRIX at https://analytics.inrix.com/roadway_analytics, accessed by Caltrans on December 18, 2019.

Bottlenecks

The 2017 I-680 Data Collection Summary identifies two bottlenecks along northbound GP lanes, located between the Washington Boulevard on-ramp and Calaveras Road off-ramp. These bottlenecks were active during the PM peak period between 2 PM and 8 PM.

Southbound bottlenecks were active during the AM peak period, typically between 7 AM and 10 AM. During the AM peak period, bottleneck locations and duration varied between SR 84 (start of the existing EL) and the SR 262 Interchange. A bottleneck occasionally developed between the Calaveras Road on-ramp and Andrade Road off-ramp. Two bottlenecks observed were caused by offramp vehicle queues to Auto Mall Parkway and SR 262 (Mission Boulevard). At both locations, local street traffic operations resulted in southbound off-ramp vehicle queues extending back onto the mainline that affected southbound mainline vehicle speeds.

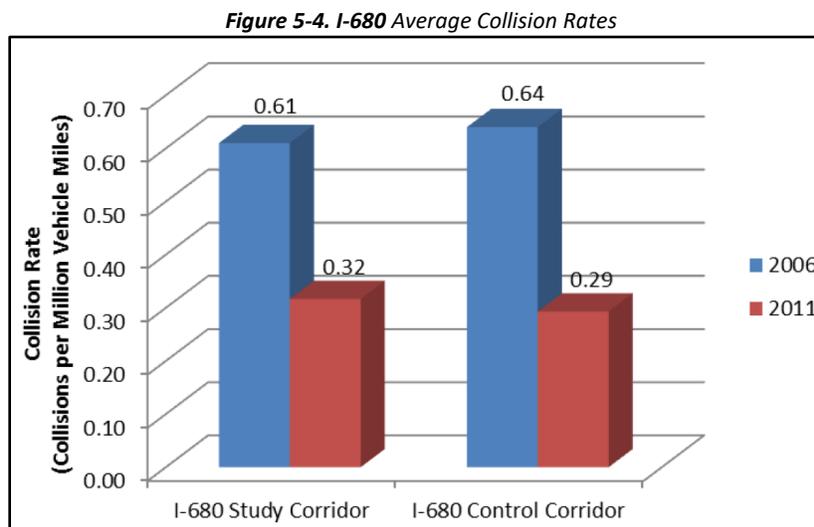
In 2017, the southbound EL typically operated in free-flow conditions for the entire day except at the southern end during PM peak period. Similar to the GP lanes, the speeds on the EL between the Jacklin Road off-ramp and EL end were impacted by the downstream bottleneck between the Berryessa Road on-ramp and McKee Road off-ramp.

Ramp Metering

All operational ramp meters were functioning well in Segment 2, with a limited number of ramp meters still in the planning phase.

Safety

As shown in **Figure 5-4**, the 2013 Southbound I-680 Express Lane Performance Evaluation found that the collision rates on the I-680 study corridor and a control corridor both dropped more or less by 50 percent between 2006 and 2011. The control corridor is a corridor with similar characteristics that did not undergo any changes during the study period. Reasons for such significant changes could not be obtained from the CHP at the time of report development.



Source: Southbound I-680 Express Lane Performance Evaluation, June 2013, Figure ES-4, page ES-9.

TASAS accident data for I-680 within the study limits for the three-year period from January 1, 2016 through December 31, 2018 is summarized in **Table 5-2**.

Table 5-2. Three-Year Accident Data, January 1, 2016 to December 31, 2018

Location	Number of Collisions Total	Actual Collision Rate per million vehicle miles			Average Collision Rate per million vehicle miles		
		Total	F	F + I*	Total	F	F + I
SCL 237 to ALA CL	181	0.52	0.006	0.22	0.8	0.003	0.25
ALA CL to SR 84	1875	1.01	0.004	0.32	0.76	0.005	0.25

Source: Caltrans, TASAS-TSN report
 * F = Fatal, I = Injury, CL = County Line

Segment 2

This section documents the existing conditions of Segment 2 of the I-680 Corridor from SR 84 in Alameda County to Alcosta Boulevard at the county line with Contra Costa County. Information presented in this section, unless otherwise noted, came from the *Draft Traffic Operations Analysis Report (TOAR) for I-680 Express Lanes from State Route 84 to Alcosta Boulevard (March 2019)*. The TOAR was prepared for a project that would widen the freeway and add an HOV/Express Lane (in the median) along I-680 between SR 84 and Alcosta Boulevard in Contra Costa County. The project would close a gap in the existing and in-construction portions of the I-680 Alameda/Contra Costa County HOV/express lane system between Fremont and Walnut Creek. This project is also known as the Gap Closure Project, delivered in multiple phases. The study area of this 2019 TOAR includes I-680 northbound from the Washington Boulevard Interchange to the Bollinger Canyon Road Interchange (outside CMCP corridor limits), and I-680 southbound from the Bollinger Canyon Road Interchange to the Sheridan Road Interchange. This segment of I-680 is a fully access-controlled freeway, with typically three GP lanes in each direction and no managed lanes. The Gap Closure Project is currently going through the development process.

AADT and Truck Volume

Using Caltrans Traffic Census data, shown in **Table 5-3**, the daily mainline volumes are highest near I-580 and toward Alcosta Boulevard. Volumes range from 147,000 to 173,000. For truck traffic, the section north of I-580 shows a lower number in total trucks and a diminishment of trucks with five axles or more compared to the section to the south.

Table 5-3. 2016 AADT and Truck Percentage

County	I-680 Post Miles	Location	2016 AADT Volumes	Trucks of Total Traffic	Trucks Five or More Axles
ALA	R11.04	SR 84	147,000	7.6%	58%
	R20.06	I-580	172,000	7.6%	57%
CC	R0.01	Alcosta Boulevard	173,000	5.3%	31%

Source: Caltrans Traffic Census Database, 2016 <http://www.dot.ca.gov/trafficops/census/>

Freeway Congestion

While not ranked in MTC’s Vital Signs report, Segment 2 still experiences consistent congestion in the southbound direction during the morning commute. As shown in **Figures 5-5** and **5-6**, the INRIX speed contour maps show that for Segment 2, the consistent southbound morning congestion grew from 2015 to 2019 with respect to both length and duration. In the northbound direction, evening commute congestion is more visible in 2019, indicating demand has reached roadway capacity.⁴¹

⁴¹ Data from INRIX https://analytics.inrix.com/roadway_analytics, accessed by Caltrans on December 18, 2019.

Figure 5-5. INRIX Speed Contour Maps I-680 from SR 84 to Alcosta Boulevard, March 2015

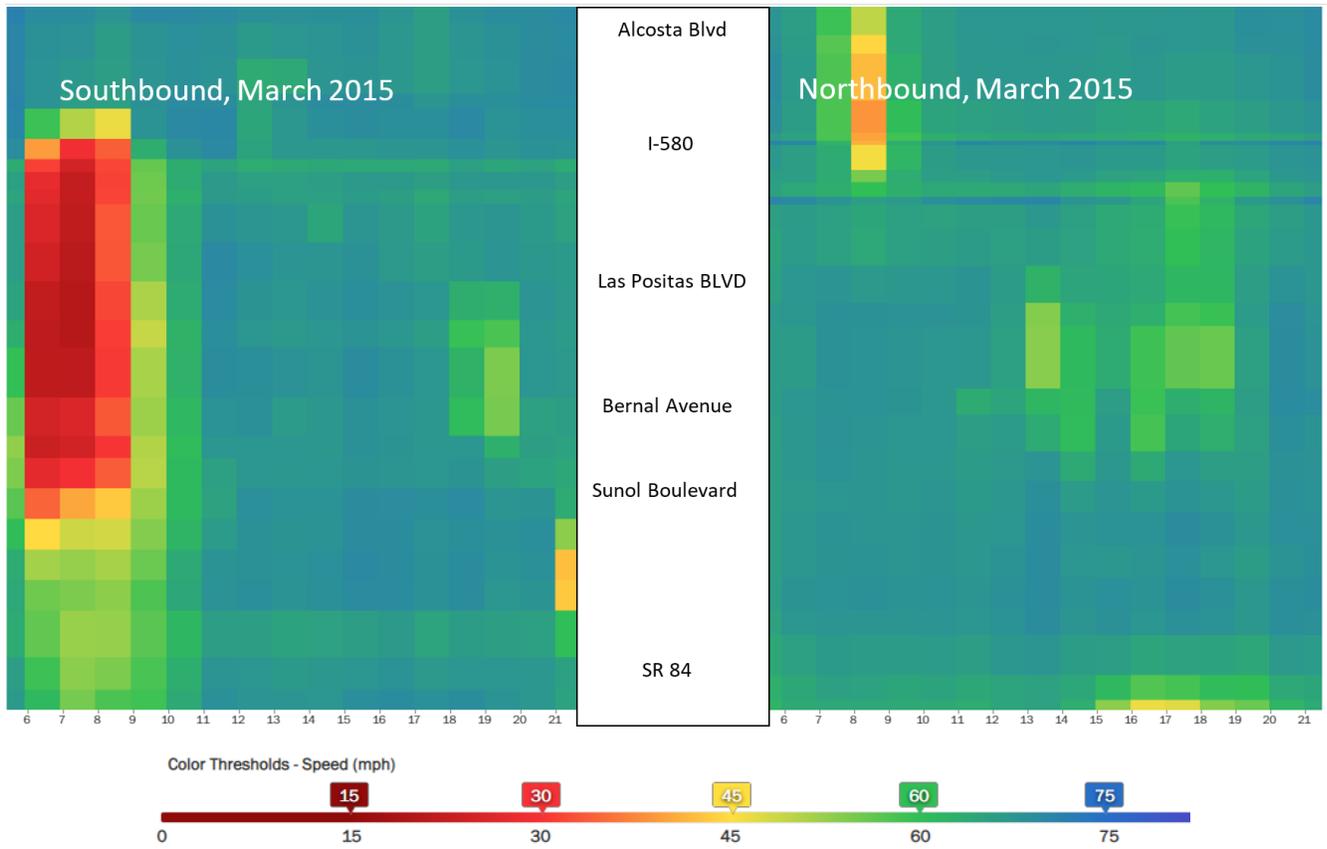
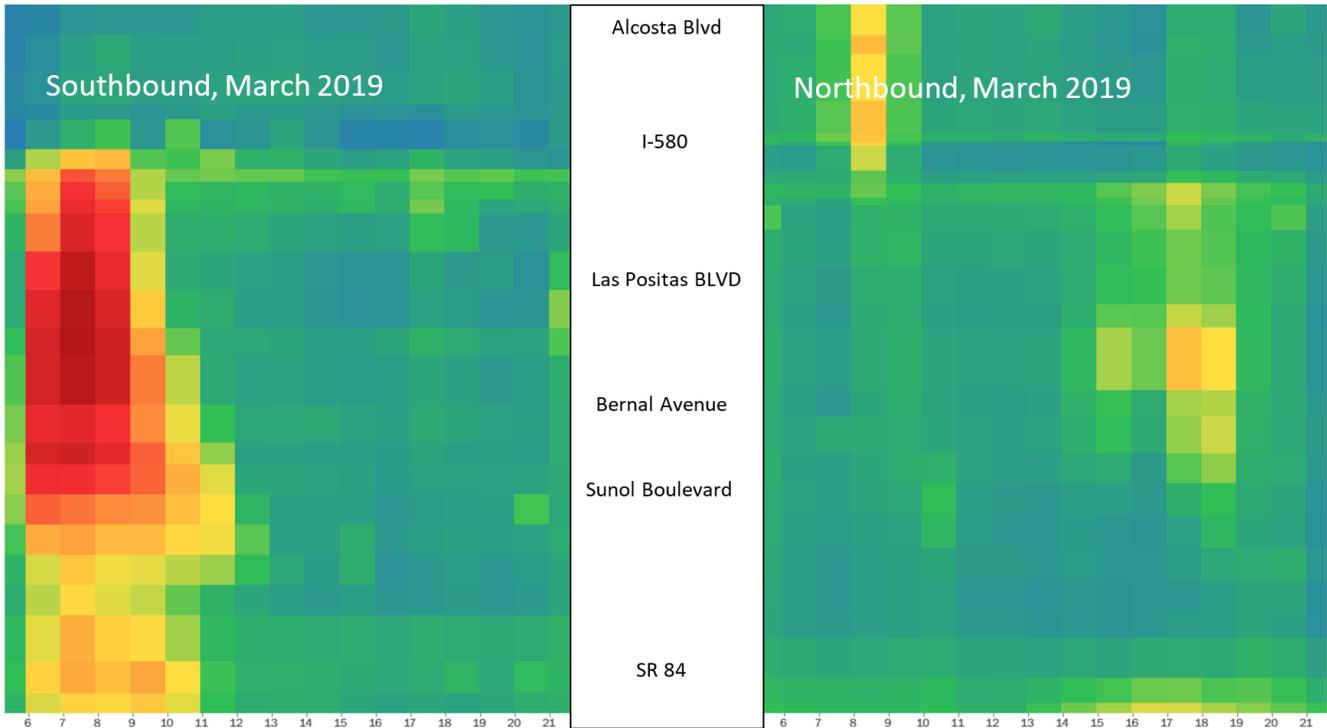


Figure 5-6. INRIX Speed Contour Maps I-680 from SR 84 to Alcosta Boulevard, March 2019



Bottlenecks

According to the 2019 TOAR, during the AM peak period there is a southbound bottleneck that develops between 6 AM and 10 AM between the Sunol Boulevard loop on-ramp and the Koopman Road off-ramp. The queue from this bottleneck extends as far back as the westbound I-580 off-ramp.

During the PM peak period there is a southbound bottleneck that develops between the Bollinger Canyon Road diagonal on-ramp and the Alcosta Boulevard on-ramp, from 4:30 PM to 6:30 PM. While this bottleneck is beyond the northern limit of the I-680 Corridor for this CMCP, it affects the Corridor by controlling the flow of traffic entering the Corridor. The TOAR also suggests an additional PM bottleneck between the Stoneridge Drive diagonal on-ramp and the Bernal Avenue off-ramp, but it is not visible on the speed contour maps above. This bottleneck occurs between 5:30 PM and 6:00 PM. The queue from this bottleneck reaches as far upstream as the Stoneridge Drive off-ramp.

During the AM peak period there are no northbound bottlenecks in the study area. Traffic moves at free-flow speeds (65 miles per hour) throughout the study area, though saturation points are more visible.

During the PM peak period, there is a northbound bottleneck located at the weave section between the Stoneridge Drive diagonal on-ramp and the eastbound I-580 off-ramp. This bottleneck is active and controlling between 5:00 PM and 7:00 PM. Queues from this bottleneck form in the right lane only and extend to the Stoneridge Drive off-ramp.

Ramp Metering

Ramp metering was found to function well along I-680 in the study area with vehicle queues observed of generally less than 10 vehicles per lane. Exceptions to this are occurring in the AM at the Bernal Avenue southbound loop on-ramp and the Sunol Boulevard southbound loop on-ramp, with spill-backs onto local streets. Also in the AM, queues formed at the southbound SR 84 to southbound I-680 connector; when the queue is visible from the mainline this entices some drivers to use the exit to Paloma Way and re-enter the freeway at the on-ramp.

Safety

Accident data for I-680 within the study limits provided by Caltrans for the three-year period from January 1, 2016 through December 31, 2018. **Table 5-4** summarizes the accident data.

Table 5-4. Three-Year Accident Data, January 1, 2016 to December 31, 2018

Location	Number of Collisions Total	Actual Collision Rate per million vehicle miles			Average Collision Rate per million vehicle miles		
		Total	F	F + I*	Total	F	F + I
SR 84 to Alcosta Boulevard	737	0.47	0.002	0.14	0.95	0.007	0.31

Source: Caltrans, TASAS-TSN report

* F = Fatal, I = Injury

Measures of Effectiveness

The 2019 TOAR includes the following measures of effectiveness, as shown in **Table 5-5**. The TOAR study area is slightly larger than Segment 2, with the following definition:

- Southbound travel through the Corridor extends from the Bollinger Canyon Road on-ramp (north of Segment 2) to the Sheridan Road on-ramp in Segment 1; and
- Northbound travel through the Corridor extends from the Washington Boulevard on-ramp (in Segment 1) to the Bollinger Canyon Road off-ramp north of Segment 2.

Table 5-5. Existing Conditions Network Measures of Effectiveness

Measure	AM Peak Period	PM Peak Period
All Origin-Destination Pairs		
Volume Served	168,900	163,700
Vehicle Miles of Travel (VMT)	1,789,900	1,686,200
Vehicle Hours of Delay (VHD) in hours	5,550	11,720
SB Travel Through the Corridor		
Average Travel Time (minutes)	19.7	14.4
Average Travel Speed (mph)	52.0	64.6
Maximum Individual Vehicle Delay (minutes)	17.0	2.7
NB Travel Through the Corridor		
Average Travel Time (minutes)	16.1	23.4
Average Travel Speed (mph)	65.3	46.9
Maximum Individual Vehicle Delay (minutes)	1.3	11.3

Source: TOAR for I-680 Express Lanes from State Route 84 to Alcosta Boulevard, March 2019, page 52, Table 3-5

- AM Peak Period represents eight hours from 5:00 AM to 1:00 PM
- PM Peak Period represents seven hours from 2:00 PM to 9:00 PM
- Combined statistics of all origin-destination pairs i.e., mainlines, entry and exit points, all on- and off-ramps, and intersections in the study network.

5.2 Future Operating Conditions and Alternatives

This section describes the future I-680 Corridor performance mainly derived from the following reports:

- *Final Draft Traffic Operations Analysis Report for I-680 Northbound (SR 237 to SR 84) Express Lane Project (October 2013)*. The study limits are northbound I-680 from SR 237 (SCL, I-680 PM M7.65) to Alcosta Boulevard (CC, I-680, PM 0.1), as well as the “Tri-Valley Triangle” area generally bounded by I-680, I-580, and SR 84.
- *Draft Traffic Operations Analysis Report for I-680 Sunol Express Lane — Southbound Access Conversion (June 2016)*. The study limits are southbound I-680 from Sunol Boulevard (ALA, I-680, PM R11.85) to SR 237 (SCL, I-680 PM M7.65).
- *Draft Traffic Operations Analysis Report for I-680 Express Lanes from State Route 84 to Alcosta Boulevard (March 2019)*. The study limits are in northbound direction from Washington Boulevard (ALA, I-680, PM M5.31) to Bollinger Canyon Road (CC, I-680, PM R2.89), and in southbound direction from Bollinger Canyon Road to Sheridan Road (ALA, I-680, PM R8.31).

These reference documents are pertaining to different phases of the I-680 Express Lanes, some of which are operational or being developed while others are planned for the future. Therefore, data coverage and analysis methodology may not always be consistent between documents. This is an inherent limitation of the hybrid approach used to create this CMCP. Where data was not available, data from the 2014 Alameda Travel Demand Model and the 2017 MTC Travel Demand Model were used to provide a high-level overview of future freeway performance.

Segment 1

This section documents the future conditions of Segment 1 of the I-680 Corridor from SR 237 in Santa Clara County to SR 84 in Alameda County.

The Final Draft Traffic Operations Analysis Report (TOAR) for I-680 Northbound (SR237 to SR 84) Express Lane Project (October 2013) examines the northbound direction with three scenarios under 2040 conditions:

- No Project
- Phase 1 Project – with a continuous-access HOV/Express Lane added to the No Project network from just south of Auto Mall Parkway to just north of SR 84, and an auxiliary lane added between the Washington Boulevard on-ramp and the off-ramp to SR 238, and
- Full Project – with a continuous-access HOV/Express Lane added to the No Project network from SR 237 to just north of SR 84, and auxiliary lanes to be added between all interchange pairs that do not currently have them, from the Jacklin Road to the SR 238.

There is not a recent study that provides travel forecasting or future scenario evaluation for the southbound direction, partly because there are no major projects planned, with the exception of converting the existing EL to continuous access. As an alternative, travel demand models from MTC and Alameda CTC were used to provide a general look of the future conditions in the southbound direction.

Alameda CTC Travel Demand Model

The Alameda CTC Travel Demand Model daily volumes are available for 2010 and 2040, presented in **Table 5-6**.

Table 5-6. I-680 Daily Volumes 2010 and 2040 from the Santa Clara County line to SR 84

	2010 Daily Volumes	2040 Daily Volumes	Growth	Annualized Growth
Southbound	80,350	97,800	21.7%	0.72%
Northbound	92,150	107,000	16.1%	0.54%

Source: 2014 Alameda CTC Travel Demand Model

MTC Travel Demand Model

MTC’s Travel Demand Model was also used to create a comparison to the information provided above from the Alameda CTC Travel Demand Model. MTC data is presented in **Table 5-7**.

Table 5-7. MTC Travel Demand Model Data for 2015 and 2040

	2015 Daily Volumes	2040 Daily Volumes	Growth	Annualized Growth
SR 237 – SR 262				
Southbound	80,500	91,000	13.0%	0.43%
Northbound	63,500	81,500	28.3%	0.94%
SR 262 – SR 238				
Southbound	92,500	114,500	23.8%	0.79%
Northbound	79,500	107,000	34.6%	1.15%
SR 238 – SR 84				
Southbound	105,500	142,500	35.1%	1.17%
Northbound	98,000	127,000	29.6%	0.99%

Source: 2017 MTC Travel Demand Model

The traffic volume figures do not fully align between the two models, yet both point to a significant increase in traffic by 2040. Generally, the MTC Travel Demand Model shows greater annualized growth rates compared to the Alameda CTC Model. The only exception is southbound between SR 237 and SR 262. Both models include all nine Bay Areas counties, the Alameda CTC Model includes more detailed information about Alameda County.

Final Draft TOAR for I-680 Northbound (SR237 to SR 84) Express Lane Project

As discussed before, an EL is planned from SR 237 to SR 84 in the northbound direction, and Phase 1 of this project between Auto Mall Parkway and SR 84 is currently under construction, with completion expected by the end of 2020. The TOAR for this project provides more detailed evaluation of Segment 1 of the Corridor.

Bottlenecks

Table 5-8 lists northbound bottlenecks and their characteristics under different scenarios in 2040. The existing bottlenecks at the Washington Boulevard on-ramp and Andrade Road on-ramp will continue to be present, while new bottlenecks are formed in both Segments 1 and 2. Introducing either the

Phase 1 project or the full project will result in additional bottlenecks in the Corridor but will reduce the duration of congestion when compared to the No-Project scenario.

Table 5-8. Northbound Bottlenecks in 2040

	No Project	Phase 1 Project	Full Project
Bottleneck Locations	1. Washington Boulevard On-Ramp*	1. Scott Creek Road On-Ramp*	1. Scott Creek Road On-Ramp
	2. Truck Scales Lane Drop	2. SR 262 On-Ramp	2. SR 262 On-Ramp
	3. Andrade Road On-Ramp	3. Washington Boulevard On-Ramp	3. Washington Boulevard On-Ramp
	4. Alcosta Boulevard On-Ramp	4. Lane Drop North of Vallecitos Road	4. Lane Drop North of Vallecitos Road
		5. Sunol Boulevard On-Ramp	5. Sunol Boulevard On-Ramp
		6. Bernal Avenue On-Ramp	6. Bernal Avenue On-Ramp
		7. Dublin Boulevard On-Ramp	7. Dublin Boulevard On-Ramp
		8. Alcosta Boulevard On-Ramp	8. Alcosta Boulevard On-Ramp
Maximum Total Distance of Vehicle in Queue	26 miles	33 miles	27 miles
Duration of Congestion	More than 6 hours**	5.5 hours**	5 hours**

Source: 2013 TOAR for I-680 Northbound Express Lane Project, Table 7-2, page 82

* Indicating the most severe bottleneck for each scenario.

** Value represents the maximum total distance by summing the individual queue lengths from each bottleneck.

Measures of Effectiveness

Measures of effectiveness (MOEs) across the TOAR study area for the six-hour PM peak period are presented in **Table 5-9** for the No Project, Phase 1 Project and Full Project scenarios.

Table 5-9. 2020 and 2040 PM Peak Period Measures of Effectiveness

	Total Travel Time	Average Travel Speed	Vehicle-Hours of Delay	Person-Hours of Delay
2020				
No Project	24,900	37 mph	11,900	14,000
Phase 1 Project	17,900	55 mph	3,900	4,600
Full Project	17,900	55 mph	3,900	4,600
2040				
No Project	62,500	24 mph	41,200	48,400
Phase 1 Project	60,300	28 mph	36,600	42,900
Full Project	54,400	32 mph	30,200	34,400

Source: 2013 TOAR for I-680 Northbound Express Lane Project, Table 6.3, page 72, and Table 7.3, page 84.

Table 5-10. MOE Percentage Change Compared to No Project

	2020 Phase 1 Project	2040 Phase 1 Project	2020 Full Project	2040 Full Project
Total Travel Time	- 28%	- 4%	- 28%	- 13%
Average Travel Speed	+ 49%	+ 17%	+ 49%	+ 33%
Vehicle Hours of Delay	- 67%	- 11%	- 67%	- 27%
Person Hour of Delay	- 67%	- 11%	- 67%	- 29%

Source: 2013 TOAR for I-680 Northbound Express Lane Project, Table 6.3, page 72, and Table 7.3, page 84.

While the overall levels of congestion and delay in the Corridor are expected to increase substantially by 2040, implementing Phase 1 and the Full Project would reduce vehicle-hours of delay by 11 percent and 27 percent, respectively, as shown in **Table 5-10**. The Full Project from SR 237 to SR 84 provides additional operational benefits compared to just the Phase 1 Project, particularly in the southern part of the Corridor extending into Santa Clara County.

Segment 2

This section summarizes the future conditions of the I-680 Corridor in Segment 2 from SR 84 to the Contra Costa County line. Information presented in this section is derived from the Draft Traffic Operations Analysis Report for I-680 Express Lanes from State Route 84 to Alcosta Boulevard (March 2019). The TOAR was prepared for a project that would widen the freeway and add an HOV/Express Lane (in the median) along I-680 between SR 84 and Alcosta Boulevard in Contra Costa County. The project would close a gap in the existing and in-construction portions of the I-680 Alameda/Contra Costa County HOV/express lane system between Fremont and Walnut Creek. This project is also known as the Gap Closure Project, to be constructed in multiple phases. The TOAR study limits are in northbound direction from Washington Boulevard (ALA, I-680, PM M5.31) to Bollinger Canyon Road (CC, I-680, PM R2.89), and in southbound direction from Bollinger Canyon Road to Sheridan Road (ALA, I-680, PM R8.31). This 2019 TOAR uses Year 2025 as near-term horizon year (Build Year) and Year 2045 as long-term horizon year (Design Year), which is different than the 2013 TOAR discussed before for Segment 1.

The No-Build Alternative assumes the following modifications to be completed by Year 2025:

- I-680 Northbound HOV/Express Lane Project Phase 1: from Auto Mall Parkway to just north of the northbound SR 84 off-ramp (continuous access, currently under construction)
- Existing Alameda/Santa Clara County I-680 Southbound HOV/Express Lane conversion to continuous access (currently under construction)
- SR 84 (Vallecitos Road) corridor widened to four lanes from Ruby Hills Drive to I-680
- Consolidated access point (signalized) at Vallecitos Road (SR 84)/Vallecitos Atomic Laboratory Road-Little Valley Road
- I-680/SR 84 Interchange improvements
 - HOV meter bypass lane for southbound SR 84 connector to southbound I-680
 - Northbound I-680 to northbound SR 84 connector widened to a two-lane exit (one exit only lane plus one optional exit lane)
 - Modified Calaveras Road (SR 84) on-ramp to northbound I-680 and northbound SR 84
- Southbound I-680 Express Lane extended upstream to approximately 0.8 miles north of Koopman Road
- Activate northbound I-680 PM peak period ramp meters from the Vargas Road on-ramp to the Stoneridge Drive diagonal on-ramp (inclusive of these ramps); meters active from 2:00 PM to 7:00 PM (under construction)

The Build Alternative includes all modifications as shown with the No-Build Alternative but with ELs added in both directions between SR 84 and Alcosta Boulevard. Consistent with other ELs that are currently being planned and implemented in the Bay Area, the Build alternative would allow continuous access between the ELs and the adjacent GP lanes.

TSMO strategies such as ramp metering, TOS, and auxiliary lanes are already in use within the project limits. Additional TOS elements for transportation management will be installed as part of this project. They include vehicle detection systems to monitor traffic speed and density, and enforcement, incident management, and other subsystems to maintain acceptable traffic flow in the HOV/express lanes.

Traffic Demand Management (TDM) focuses on regional means of reducing the number of vehicle trips and VMT as well as increasing vehicle occupancy. The proposed HOV/ELs would facilitate transit use and ridesharing. In addition, the vehicle detection systems for monitoring traffic speed and density to maintain an acceptable LOS in the HOV/express lanes would benefit transit and other HOVs.

To establish a comparison with Segment 1, estimates from the Travel Demand Models of both Alameda County and MTC are provided here as well.

Alameda CTC Travel Demand Model

The Alameda CTC Travel Demand Model daily volumes are available for 2010 and 2040, presented in **Table 5-11**.

Table 5-11. I-680 Daily Volumes 2010 and 2040 from SR 84 to the Contra Costa County line

	2010 Daily Volumes	2040 Daily Volumes	Growth	Annualized Growth
Southbound	76,650	86,300	12.6%	0.42%
Northbound	68,650	73,800	7.5%	0.25%

Source: 2014 Alameda CTC Travel Demand Model

MTC Travel Demand Model

MTC’s Travel Demand Model was also used to create a comparison to the information provided above from the Alameda CTC Travel Demand Model. MTC data is presented in **Table 5-12**.

Table 5-12. MTC Travel Demand Mode Data for 2015 and 2040

	2015 Daily Volumes	2040 Daily Volumes	Growth	Annualized Growth
SR 84 – Sunol Blvd				
Southbound	74,500	85,500	14.8%	0.59%
Northbound	66,500	74,500	12.0%	0.48%
Sunol Blvd – I-580				
Southbound	65,200	75,500	15.8%	0.63%
Northbound	57,000	62,900	10.6%	0.41%
I-580 – Alcosta Blvd				
Southbound	97,000	116,800	20.4%	0.82%
Northbound	99,300	107,800	8.6%	0.34%

Source: 2017 MTC Travel Demand Model

The traffic volume figures for Segment 2 do not fully align between the two models, yet both point to a substantial increase in traffic by 2040. Generally, the MTC Travel Demand Model shows greater annualized growth rates compared to the Alameda CTC Model.

The following information is from the Draft Traffic Operations Analysis Report for I-680 Express Lanes from State Route 84 to Alcosta Boulevard (March 2019).

Year 2025 Bottlenecks

I-680 General Purpose Lanes No Project:

- SB between Sunol Boulevard and Koopman Road (5:30 AM – 10:00 AM)
- SB between Bollinger Canyon (north of Segment 2) and Alcosta Boulevard (3:30 PM – 7:00 PM)
- SB between Stoneridge Drive and Bernal Avenue (4:30 PM – 7:00 PM)
- NB between Stoneridge Drive and I-580 (4:30 PM – 7:00 PM)

I-680 General Purpose Lanes with Project:

- SB between Paloma Way (SR 84) and Andrade Road (6:30 AM – 7:30 AM)
- SB between Bollinger Canyon (north of Segment 2) and Alcosta Boulevard (3:30 PM – 7:00 PM)
- NB between Stoneridge Drive and I-580 (5:30 PM – 6:00 PM)

While bottlenecks may still occur with the Express Lane project in place, the duration of congestion diminishes significantly. For example, the first bottleneck shifted south toward the southbound Express Lane entrance and was reduced from 4.5 hours to one hour.

The Express lanes are expected to remain free flowing with speeds expected to be higher than 50 miles per hour. Volumes are expected to remain at or below 1650 vehicles per hour, ensuring operations would meet federal guidelines.

Year 2045 Bottlenecks

I-680 No Project:

- SB between Sunol Boulevard and Koopman Road (5:00 AM – 12:30 PM)
- SB between Bollinger Canyon (north of Segment 2) and Alcosta Boulevard (11:30 AM – 1:00 PM)
- SB between Bollinger Canyon (north of Segment 2) and Alcosta Boulevard (2:00 PM – 9:00 PM)*
- SB between Stoneridge Drive and Bernal Avenue (4:30 PM – 7:00 PM)
- NB between Alcosta Boulevard and Bollinger Canyon (north of segment 2, 7:30 Am – 10:00 AM)
- NB between Bernal Avenue and Stoneridge Drive (8:00 AM – 11:30 AM)*
- NB between Andrade Road and Calaveras Road/SR 84 (8:00 AM – 1:00 PM)*
- NB between Andrade Road and Calaveras Road/SR 84 (2:30 PM – 9:00 PM)*
- NB between Bernal Avenue and Stoneridge Drive (3:30 PM – 8:00 PM)*
- NB between Stoneridge Drive and I-580 (4:00 PM – 7:30 PM)
- NB between Sunol Boulevard and Bernal Avenue (4:30 PM – 8:30 PM)*

**Bottlenecks temporarily hidden by the spillback from other bottlenecks in this list.*

I-680 With Project:

- SB between Sunol Boulevard and Koopman Road (6:30 AM – 7:30 AM)
- SB between Paloma Way (SR 84) and Andrade Road (5:30 AM – 8:30 AM)
- SB between Alcosta Boulevard and I-580/Dublin Boulevard (8:00 AM – 11:00 AM)

- SB between Bollinger Canyon (north of Segment 2) and Alcosta Boulevard (2:00 PM – 9:00 PM)*
- SB between Stoneridge Drive and Bernal Avenue (5:00 PM – 6:30 PM)
- NB between Alcosta Boulevard and Bollinger Canyon (north of segment 2, 7:30 Am – 10:30 AM)
- NB between Bernal Avenue and Stoneridge Drive (8:30 AM – 11:00 AM)*
- NB between Andrade Road and Calaveras Road/SR 84 (8:00 AM – 11:00 AM)*
- NB between Andrade Road and Calaveras Road/SR 84 (2:30 PM – 8:30 PM)
- NB between Stoneridge Drive and I-580 (4:00 PM – 7:30 PM)

**Bottlenecks temporarily hidden by the spillback from other bottlenecks in this list.*

Compared to 2025 No-Project conditions, it is projected that by 2045 there will be more bottlenecks in Segment 2 and the duration of the congestion period will continue to grow. Implementing the Gap Closure Project would reduce the number of bottlenecks and/or the duration of the congestion period.

Measures of Effectiveness

Three MOEs were used to gauge the benefits of the Gap Closure Project: vehicle-hours of delay, travel time and maximum individual delay.

As shown in **Table 5-13**, the project would substantially reduce vehicle delay for all users in the study area by eliminating or reducing the severity of bottlenecks along I-680. For example, the project substantially reduces the future effect of the existing AM peak period bottleneck along southbound I-680 between the Sunol Boulevard on-ramp and the Koopman Road (Town of Sunol) off-ramp. The project also substantially reduces the future effect of the existing PM peak period bottleneck along northbound I-680 between Stoneridge Drive and I-580. Both of these bottlenecks cause queuing and delay today, and delays are projected to worsen in the Year 2025 No-Project and Year 2045 No-Project scenarios. In the Year 2025 scenario, overall vehicle-hours of delay would be reduced by 34 to 46 percent per peak period with the project. In the Year 2045 scenario, overall vehicle-hours of delay would decrease by 23 to 54 percent per peak period with the project.

Table 5-13. Change in Systemwide Peak Period Vehicle Hours of Delay

Study Period	Vehicle Hours of Delay		
	No Project (hr)	With Project (hr)	Change
Year 2025 (Build Year)			
AM	8,240	4,410	-46%
PM	5,390	3,540	-34%
Year 2045 (Design Year)			
AM	49,500	23,000	-54%
PM	51,500	39,500	-23%

Source: I-680 Express Lanes Study from SR 84 to Alcosta Boulevard, March 2019, Table S-1, p. iv

As shown in **Table 5-14**, Year 2025 travel time savings for northbound I-680 is more modest because operations on the Corridor will be improved by two background projects: the I-680 Northbound HOV/EL Project between SR 262/Auto Mall Parkway in Fremont and SR 84 (currently under construction, expected to open in 2020) and the SR 84 Expressway Widening and SR 84/I-680 Interchange Improvements Project (currently in final design, expected to open by 2025).

Year 2045 travel times along the I-680 Corridor under the With Project scenario will be substantially improved when compared to the No-Project scenario. Travel times along southbound I-680 are

anticipated to decrease by 53 percent in the AM peak period and 14 percent in the PM peak period. Northbound I-680 travel times are anticipated to decrease by 22 to 26 percent.

Table 5-14. Peak Period Average Travel Time

Direction	Study Period	Travel Time		
		No Project (min)	With Project (min)	Change
Year 2025 (Build Year)				
SB	AM	19.6	14.4	-27%
SB	PM	15.6	14.6	-6%
NB	AM	16.4	16.4	No change
NB	PM	17.4	16.2	-7%
Year 2045 (Design Year)				
SB	AM	35.4	16.8	-53%
SB	PM	17.9	15.4	-14%
NB	AM	33.3	25.8	-22%
NB	PM	37.7	28.0	-26%

Source: 2019 TOAR for I-680 Express Lanes from SR 84 to Alcosta Boulevard, Table S-2, pp. v and vi

- Travel through the Corridor includes only those vehicles that travel between the two discrete points.
- Study Period: AM Peak Period represents 5:00 AM to 1:00 PM, PM Peak Period represents 2:00 PM to 9:00 PM
- Southbound travel through the Corridor extends from the Bollinger Canyon Road diagonal on-ramp gore to the Sheridan Road on-ramp gore
- Northbound travel through the Corridor extends from the Washington Boulevard on-ramp gore to the Bollinger Canyon Road off-ramp gore

Another MOE to illustrate the project benefits is maximum individual delay, which represents the relative level of congestion throughout the peak period. A smaller value of maximum individual delay indicates that travel times are more reliable throughout the peak period, which allows drivers to better plan their travel when using the Corridor. As **Table 5-15** shows, the Gap Closure Project is expected to significantly reduce maximum individual delay in both directions during both peak periods, when compared to the No-Project scenario.

Table 5-15. Maximum Individual Delay

Direction	Study Period	Maximum Individual Delay		
		No Project (min)	With Project (min)	Change
Year 2025 (Build Year)				
SB	AM	16.5	1.1	-93%
SB	PM	5.8	1.4	-76%
NB	AM	1.0	0.5	-50%
NB	PM	4.1	0.5	-88%
Year 2045 (Design Year)				
SB	AM	46.9	7.0	-85%
SB	PM	14.3	3.3	-77%
NB	AM	72.5	36.4	-50%
NB	PM	46.6	20.4	-56%

Source: I-680 Express Lanes Study from SR 84 to Alcosta Boulevard, March 2019, Table S-2, p vii

Southbound I-680 from the Bollinger Canyon Road diagonal on-ramp to the Sheridan Road on-ramp, Northbound I-680 from the Washington Boulevard on-ramp to the Bollinger Canyon Road off-ramp.

Chapter 6: Public Outreach

The following includes a review of public outreach efforts and activities that have occurred in Alameda, Santa Clara and Contra Costa Counties, concerning plans or projects with implications to the I-680 Corridor. **Table 6-1** below summarizes the outreach that is described throughout this chapter. *Appendix B* offers a more detailed breakdown of efforts and activities in Alameda County.

Table 6-1. Summary of Public Outreach

Source Title	Plan/Study/Project
2016 Alameda Countywide Transportation Plan (CTP)	Plan
2020 Alameda Countywide Transportation Plan Update	Plan
Alameda County Goods Movement Plan, 2016	Plan
Plan Bay Area 2040	Plan
Plan Bay Area 2050	Plan
Caltrans District 4 Bike Plan, 2018	Plan
Santa Clara County Valley Transportation Plan 2040	Plan
I-680 South Corridor Study, 2016	Study
2017 Contra Costa Countywide Comprehensive Transportation Plan	Plan
I-680 Transit Investment/Congestion Relief Options Study, 2015	Study
I-680 Northbound HOV/Express Lane Project, 2013	Project
SR 84 Expressway Widening and SR 84/I-680 Interchange Improvements Project, Project Approval and Environmental Document (PA&ED) Phase, 2016	Project
HOV/Express Lanes from SR 84 to Alcosta Blvd, 2019	Project

6.1 2016 Alameda Countywide Transportation Plan

The Alameda County Transportation Commission (Alameda CTC) engaged in comprehensive public outreach activities from January 2016 to April 2016 to understand the transportation issues and priorities throughout the County and inform development of the Countywide Transportation Plan (CTP).⁴²

The first phase of outreach consisted of a series of open houses in various locations throughout the county. Workshops were held at four transit-accessible locations, including the Dublin Public Library, Hayward City Hall, Fremont Public Library, Alameda CTC Office (Oakland). To promote attendance, a flyer

⁴² Alameda County Resident Survey Countywide Transportation Plan Update. Executive Summary, dated 2019.

was developed and translated into Chinese and Spanish. Particular efforts were made to reach economically disadvantaged and culturally diverse communities, especially those with limited English proficiency. A total of approximately 192 participants attended four workshops, representing a wide variety of community organizations, advocates, and local agency representatives.

In the second phase of outreach, a series of intercept surveys were conducted during March 2016. Survey locations included South Hayward, Ashland/Cherryland in unincorporated Alameda County, City of Alameda, Oakland, and Berkeley, and included questions regarding demographic and neighborhood residency, mobility and transportation mode, bicycles and pedestrians, safety, pavement quality and impacts to daily transportation, transit use and related obstacles, and effective information sharing related to transit.

6.2 2020 Alameda Countywide Transportation Plan Update

In May 2019, a poll was conducted among 503 residents in Alameda County to assist in an update to the Countywide Transportation Plan (CTP). Census tracts that were identified by the Metropolitan Transportation Commission (MTC) as a Community of Concern (COC) were oversampled to allow for more in-depth analysis. A total of 189 interviews were conducted among residents living within a COC. The survey was conducted online, with residents being invited to the survey via email or an SMS text message.

In addition to the poll, Alameda CTC staff have brought CTP update items to public meetings of the Alameda County Technical Advisory Committee (ACTAC) and the Planning, Policy and Legislative Committee (PPLC) of the Alameda CTC Commission. These are public meetings with materials posted on the Alameda CTC website. In January and March of 2020, Alameda CTC staff presented findings from a needs assessment and initiated discussion on high level strategies to address needs. Several of the strategies discussed are relevant to the Alameda I-680 Corridor, including increasing long-distance transit options through rail and express bus, closing gaps in the managed lane network, expanding park-n-ride options, and working with employers to expand TDM options.

6.3 Alameda County Goods Movement Plan

From Fall 2013 to Summer 2016, various outreach efforts were continually initiated to assist in guiding the development of the Alameda County Goods Movement Plan, Transit Plan, and Multimodal Arterial Plan. A chronological inventory of these activities can be found in *Appendix B*, but these types of outreach are generally categorized as public meetings, focus groups (such as roundtable workshops between partner agencies and stakeholders or survey participants), website, publications or letters (such as an Executive Director's report), media, event (such as open houses), and email outreach.

6.4 Plan Bay Area 2040

The MTC and the Association of Bay Area Governments (ABAG) began working in 2014 to update Plan Bay Area, the RTP for the San Francisco Bay Area. The Plan Bay Area 2040 (PBA 2040, 2017) considers how and where the region should accommodate growth projected to 2040⁴³.

A comprehensive program of public involvement activities was a key part of MTC's long-range planning process. Many participated in RTP public open houses and other meetings, telephone and internet

⁴³ Plan Bay Area 2040: Public Engagement Report, dated 2017.

surveys, and more. The region's cities and counties also participated in the development of the Plan, as did regional agencies, including the Bay Conservation and Development Commission (BCDC) and the Bay Area Air Quality Management District (BAAQMD). Community-based organizations and advocacy groups representing the diverse interests of the Bay Area were active participants throughout the process, as were regional transportation partners. Native American Tribes were also consulted. RTP projects along the I-680 Corridor are included in Chapter 7.

6.5 Plan Bay Area 2050

As discussed earlier, MTC is developing Plan Bay Area 2050 (PBA 2050), the region's next RTP/SCS and an update to PBA 2040. As part of the update, several public meetings were held by Alameda CTC to discuss and seek approval for projects that should be considered in PBA 2050 for Alameda County. They were held in June 2019 and February 2020 at meetings of both the Alameda County Technical Advisory Committee (ACTAC) and the Planning, Policy and Legislative Committee (PPLC) of the Commission. In June 2019, ACTAC and PPLC approved a list of major projects for consideration, including projects within the I-680 Corridor. These projects were submitted to MTC/ABAG. In February 2020, ACTAC and PPLC approved a revised list of projects that also included planning level funding for trails and bus service that would complement the capital infrastructure projects. Projects within the I-680 Corridors are included in Chapter 7 of this CMCP. MTC/ABAG will adopt the project list for PBA 2050 in 2021.

6.6 Caltrans District 4 Bike Plan

Caltrans developed the District 4 Bike Plan in 2018, the first District in the State. With the assistance from a public engagement consultant, Caltrans District 4 staff designed and carried out an inclusive outreach process in 2017 with the goal of collecting input from a broad cross-section of Bay Area communities to help identify bicycle needs on and across the State highways and prioritize recommended projects. The tools used for public outreach included focus group discussion to engage with traditionally under-represented communities, creating a Technical Advisory Committee, community workshops, online survey, webinars and online project comment tools. One of the highlights from these public outreach activities is the use of technology to assist with gathering additional input from Bay Area residents. For instance, an interactive mapping survey recorded over 3,490 respondents to answer questions and provided 20,157 map "pins" to indicate their bicycling experience across the State transportation system.

6.7 Santa Clara County Valley Transportation Plan 2040

VTA developed a long-range countywide transportation plan called Valley Transportation Plan (VTP) 2040 in 2014, an update to VTP 2035 adopted in 2009. VTP 2040 provides programs, projects and policies for roadways, transit, Intelligent Transportation Systems (ITS)/Systems Operations Management (SOM), bicycle and pedestrian facilities, and land use/transportation integration. VTP 2040 projects serve as VTA's recommendations for the RTP.

The development of VTP 2040 project lists included outreach to VTA member agencies, community organizations, public officials, and the general public to help determine which projects should move forward. Project lists were initially developed from existing lists and priorities set by VTA Member Agencies. Initial lists were refined through a review process involving VTA committees and Board of Directors as well as public meetings and workshops. Among a menu of public outreach activities, three public meetings were held in Mountain View (March 19), Gilroy (March 21) and San Jose (March 25), respectively, in 2013. Other public engagement efforts included social media (Facebook and Twitter), VTP 2040 public outreach webpage as well as community outreach emails/phone calls for input and questions.

The Draft Final Plan was presented at various VTA committees before being adopted by the VTA Board of Directors.

6.8 I-680 South Corridor Study

VTA developed the I-680 South Corridor Study in 2016 for the ten-mile segment of I-680 in Santa Clara County. The study limits overlap with the limits of this CMCP from SR 237 to the Alameda/Santa Clara County line. The stakeholders in this study included Caltrans, the County of Santa Clara, and the cities of Milpitas and San José. In addition to liaison with agency staff, a public outreach process was held to receive input and feedback from the local communities. A public open house meeting was held to receive ideas on proposed improvements and to incorporate them into the study. VTA also used a web-based crowd-sourcing interface to obtain public input on problem areas within the study area. This web-based outreach was tremendously successful with responses on a broad range of highway, transit/local street, bicycle and pedestrian issues. Recommended projects from the study were later incorporated into VTA's submission to MTC for PBA 2050 consideration.

6.9 2017 Contra Costa Countywide Comprehensive Transportation Plan

The Countywide Comprehensive Transportation Plan has been prepared with substantial public input since work began with updating the plan in 2014. CCTA's outreach methods ranged from the traditional formats to new technologies, including social media. This extensive outreach effort enabled CCTA to learn how residents generally viewed the Plan's proposals and transportation needs. An online public engagement survey/comment tool and a telephone town hall meeting offered individuals the opportunity to engage with CCTA's Board members and senior staff. A website portal enabled residents to express their priorities by showing how they would allocate funding and prioritize investments across an array of projects and programs. Other efforts included countywide workshops, meetings with the Citizens Advisory Committee, public meetings, focus group and stakeholder outreach, workshops and study sessions with the Regional Transportation Planning Committees (RTPC) and a two-month online open house for residents to learn more about the Plan. The Countywide Comprehensive Transportation Plan included a comprehensive list of projects, such as Innovate I-680, which is incorporated into Chapter 7.

6.10 I-680 Transit Investment/Congestion Relief Options Study

CCTA approved the I-680 Transit Investment/Congestion Relief Options Study in 2015. An extensive public outreach process was conducted in the Fall of 2014. The effort resulted in feedback from the public indicating a strong interest in improving transit service along I-680 in Contra Costa County. In addition, the Tri-Valley, Lamorinda, and Central County Action Plans are all supportive of congestion relief and improved transit options along I-680. During the development of the study, a Policy Advisory Committee (PAC) and a Technical Advisory Committee (TAC) were established. The PAC included two transit agencies, two county agencies, three RTPCs, and six municipalities. The TAC included Caltrans, three transit agencies, three county agencies, Bike East Bay, and three Regional Transportation Planning Committees, including ten municipalities. Top ranked projects and strategies were later incorporated into Innovate 680.

6.11 I-680 Northbound HOV/Express Lane Project

This project involves implementing Express Lanes on northbound I-680 between SR 237 and SR 84. Scoping for this project included the use of several channels of communication, including the Notice of Preparation (NOP) for the EIR, mailers, internet, and newspaper ads. In addition, two public scoping meetings were

held on October 3, 2012 in Pleasanton, and on October 4, 2012 in Fremont to solicit comments from agencies and the community. A total of 20 written comments were submitted during the scoping period. Meeting attendees also provided verbal comments to the project team. Additionally, two letters were received from local agencies (Alameda County Water District and City of Pleasanton).

The draft Environmental Impact Report/Environmental Assessment (EIR/EA) was circulated for public review between November 2014 and January 2015. Outreach methods included compliance with CEQA and NEPA requirements, and notification to the local community and stakeholders in the area. Notifications were distributed via newspaper advertisements, corridor mailings, the project website, and agency notification. Information on this project was then presented at two public open forum meetings, held on January 8, 2015 in Fremont, and January 13, 2015 in Pleasanton.

6.12 SR 84 Expressway Widening and SR 84/I-680 Interchange Improvements Project

Sponsored by Caltrans and the Alameda CTC, the project proposes to widen and upgrade SR 84 to expressway standards, as well as improve SR 84/I-680 Interchange ramps and extend the existing southbound I-680 HOV/Express Lane.

In accordance with the California Environmental Quality Act (CEQA) and the National Environmental Policy Act (NEPA), Caltrans filed a Notice of Preparation for the EIR/EA in May 2016 and held three public scoping meetings around that time in Sunol, Livermore, and Pleasanton. Notification of the scoping meetings were issued in the forms of newspaper advertisements, online advertisements, invitation mailers and online postings on the Patch websites for local cities and Alameda CTC's Facebook page. Approximately 67 members participated in all three meetings.

In November 2017, Caltrans held three public review meetings for the public release of the Draft EIR/EA in Sunol, Livermore, and Pleasanton. In addition to the notification methods listed above, notification of the Draft EIR/EA review meetings was issued by Caltrans mailing and/or emailing announcements to individuals who attended scoping meetings, provided comments during the scoping period, or requested project notifications, and Caltrans mailing invitation letters to elected officials and emailing invitations to staff representatives of elected officials. Copies of the Draft EIR/EA were made available for review at the Caltrans District 4 Office in Oakland, as well as public libraries in Livermore and Pleasanton. Approximately 13 members of the public participated in each of the three meetings. Twenty-three comments were submitted during the public review period.

6.13 HOV/Express Lanes from SR 84 to Alcosta Blvd

Sponsored by the Alameda CTC, an action plan has been created pertaining to outreach leading to the environmental phase of the HOV/Express Lanes Gap Closure Project from SR 84 to Alcosta Boulevard. As is customary, Alameda CTC engages in activities such as project web page modifications, social media presence, and newsletters.

Public Information Meetings for the project were held in Dublin on October 9, 2018, Sunol on October 16, 2018, and Pleasanton on October 18, 2018. During these meetings, the project team addressed the vision of the project, project status and timeline, and solicited questions about the project while providing informational posters, helpful maps, and comment cards.

Chapter 7: Recommended Strategies

7.1 Project Lists

This section presents the recommended projects within the Alameda I-680 Corridor. There are three major project categories: 1) highway, transit and park-and-ride projects, 2) active transportation projects and 3) projects in the SHOPP and the Ten-Year SHOPP Plan/Project Book.

Highway, Transit and Park-and-Ride Projects

As shown in **Table 7-1**, the first group of projects include highway, transit and park-and-ride projects. The list includes projects in Plan Bay Area 2040 (2017), the Bay Area's current regional transportation plan, as well as additional projects that may be included in future RTP updates such as the current on-going update, Plan Bay Area 2050. Where appropriate, projects led by Contra Costa and Santa Clara Counties are included in the project list noted as CC and SCL, respectively.

The recommended highway strategies include managed lane projects, other operational improvements such as auxiliary lanes, interchange reconfiguration and local arterial projects that will help improve the operations of freeway interchanges.

The recommended transit strategies consist of a variety of projects. To leverage the travel time savings afforded by new managed lanes, transit strategies include new express bus services on I-680 with accompanying park-and-ride infrastructure and travel demand management (TDM) strategies. There are projects to improve both long-distance rail in the Corridor such as ACE in the Tri-Valley and BART in southern Alameda County, as well as local bus improvements to increase connectivity along the Corridor. Local bus enhancements include increasing on-demand services for LAVTA and AC Transit in the Fremont and Newark areas as well as investments in bus rapid transit facilities in southern Alameda County to encourage keeping shorter distance auto trips off of I-680 shifting to buses.

It is important to note that transit projects that would improve travel conditions along the I-680 Corridor but not physically connect to the Corridor are not included in the table. These projects are described in Chapter 4 of the CMCP and include heavy and commuter rail services such as improvements to BART's core capacity and connections to the South Bay as well as extensions to commuter rail beyond BART's current terminus at Dublin/Pleasanton and across the Dumbarton Bridge.

Table 7-1 also includes information on when a project is expected to be ready for construction. Projects are grouped into short, medium and long-term time frames based on the following criteria:

- Short-term: within four years (by Fiscal Year 2023/2024)
- Mid-term: between four and ten years (by Fiscal Year 2029/2030)
- Long-term: After FY 2030

Table 7-1. I-680 Corridor Future Highway, Transit, and Park-and-Ride Projects
(not in priority order)

#	Project Type	Co.	Title	Description	Cost Estimate (\$M)*	Short-Term** (0-4 Years)	Medium-Term (4-10 Years)	Long-Term (10+ Years)	RTP ID/ Source
Projects in Alameda County									
1	Interchange	ALA	I-580/I-680 Interchange	Improve capacity, operations and safety at the interchange, primarily in the westbound direction approaching the interchange. This project includes the Phase 1 short-term operational improvements.	\$1,500			X	17-01-0028
2	Interchange	ALA	I-680 Overcrossing Widening and Improvements	Widen Stoneridge Drive overcrossing at I-680 constructing third westbound lane.	\$19	X			17-01-0042
3	Interchange	ALA	I-680 Sunol Interchange Modification	Signalize Sunol at I-680 Interchange ramps and widen Southbound on ramp.	\$15	X			17-01-0044
4	Interchange	ALA	SR 84/I-680 Interchange Improvements and SR 84 Widening	Construct interchange improvements for the Route 84/I-680 Interchange, widen Route 84 from Pigeon Pass to I-680 and construct aux lanes on I-680 between Andrade and Route 84. (Currently in Design)	\$244	X			17-01-0029
5	Interchange	ALA	Auto Mall Parkway Improvements	Enhance capacity and operations of Auto Mall Parkway from Fremont Blvd to I-680, including freeway interchange upgrades and bike/ped facilities, with potential widening from four to six lanes and grade separation at Auto Mall/Osgood.	\$50		X		17-01-0052
6	Managed Lanes	ALA	I-680 Express Lanes Phase II: Northbound from SCL County Line to Auto Mall Parkway	Express lanes on I-680 in the northbound direction from Auto Mall Parkway to County Line.	\$130			X	17-10-0058

#	Project Type	Co.	Title	Description	Cost Estimate (\$M)*	Short-Term** (0-4 Years)	Medium-Term (4-10 Years)	Long-Term (10+ Years)	RTP ID/ Source
7	Managed Lanes	ALA	I-680 Express Lanes from SR 84 to Alcosta Blvd Phase 1: SB Express Lane	The SB I-680 Express Lanes from SR 84 to Alcosta Boulevard Project will close the gap between existing and in-progress High Occupancy Vehicle (HOV)/express lane projects directly to the north and south. This project is intended to include a Caltrans project that would repave the general purpose lanes along this segment for \$95 million.	\$350	X			17-10-0062
8	Managed Lanes	ALA	I-680 Express Lanes from SR 84 to Alcosta Blvd Phase 2: NB Express Lane	The NB I-680 Express Lanes from SR 84 to Alcosta Boulevard Project will close the gap between existing and in-progress High Occupancy Vehicle (HOV)/express lane projects directly to the north and south.	\$225		X		17-10-0062
9	Managed Lanes	ALA	SR 262 Mission Boulevard Cross Connector Improvements	Increase mobility between I-680 and I-880 by widening Mission Blvd. to three lanes, an express lane in each direction throughout the I-680 Interchange, rebuild the NB and SB 680 on and off-ramps, and potentially grade separate Mission Blvd. from Mohave Dr. to Warm Springs Blvd.	\$1,000		X		17-01-0020
10	Express Bus	ALA	I-680 Express Bus to Silicon Valley	The project would create an express bus service along I-680 in southern Contra Costa County through Alameda County to employment destinations in Santa Clara County. The express bus would complement the proposed express lanes along the I-680 Corridor across the three counties and serve existing and proposed park-and-ride lots.	Varies	X			MTC PBA 2050***
11	Local Bus	ALA	Fremont Transit Network Improvements	Fremont: AC Transit operating funds for frequent network to support City Center, Centerville, Irvington, Warm Springs and Fremont Blvd PDAs.	\$300	X			MTC PBA 2050

#	Project Type	Co.	Title	Description	Cost Estimate (\$M)*	Short-Term** (0-4 Years)	Medium-Term (4-10 Years)	Long-Term (10+ Years)	RTP ID/ Source
12	Local Bus	ALA	LAVTA On-Demand First-Mile/Last-Mile Microtransit Program	LAVTA's on-demand microtransit program utilizes TNCs to expand coverage to lower-density areas where traditional fixed-route service is not cost-effective to operate. The program subsidizes passengers' TNC fare by 50 percent up to \$5 per trip, though fare and discount structures intended to be flexible. This micro-transit expansion service will not duplicate, but rather expand access to fixed-route buses and regional rail.	\$18	X			MTC PBA 2050
13	Local Bus	ALA	E14th/Mission and Fremont Blvd Multimodal Corridor – Rapid Bus and Mobility Hubs	Connect the communities of central and southern Alameda County with regional transportation facilities, employment areas, and activity centers. The corridor extends through five cities provides connections throughout the inner East Bay paralleling Interstate 880 and BART.	\$330	X			MTC PBA 2050
14	Commuter Rail	ALA	Irvington BART Station	Construct a new infill BART station in Irvington PDA in Fremont on Osgood Road near Washington Boulevard (under construction in 2022).	\$180	X			17-01-0058
15	Commuter Rail	ALA	ACE Near-Term Corridor Improvements	Includes ACE track improvements, preventative maintenance, fixed guideway, locomotive procurement, railcar midlife overhaul, positive train control, FTA non-urbanized formula program, Oakland to San José double track, and ACE Saturday service.	\$137	X			MTC PBA 2050
16	Regional Rail	ALA	Altamont Corridor Vision - Mid-Term (Alameda County Portion)	Alameda County - six additional round-trips between San Joaquin Valley and San José via Altamont Pass for weekend service (ten total daily round trips weekdays).	\$1,351	X			MTC PBA 2050

#	Project Type	Co.	Title	Description	Cost Estimate (\$M)*	Short-Term** (0-4 Years)	Medium-Term (4-10 Years)	Long-Term (10+ Years)	RTP ID/ Source
17	Regional Rail	ALA	Altamont Corridor Vision - Long Term (Alameda County portion)	15 minutes to 0.5 hour frequency during peak periods; dedicated track - "Universal Corridor". The Project would provide safe, frequent, and reliable service by modernizing the corridor connecting the Central Valley and San Francisco Bay Area.	\$6,416		X		ACE
18	P&R	ALA	Climate Program: TDM and Emission Reduction Technology	Projects in this category implement strategies and programs that reduce emissions, encourage alternative transportation modes, and manage transportation demand.	\$150		X		17-01-0002
19	Park-and-Ride	ALA	Scott Creek Road Park-and-Ride Lot	Construct a new park-and-ride lot at the Scott Creek Road Interchange	\$1.9	X			Caltrans
20	P&R	ALA	Bernal Avenue Park-and-Ride Lot	Tri-Valley Integrated Transit and Park-and-Ride Study proposes to construct a new park-and-ride lot at southwest corner of the Bernal Avenue Interchange.	\$1.1	X			18548
Projects in Other Counties									
21	Interchange	SCL	I-680/Calaveras Interchange Improvements	Modify Calaveras Blvd SB off-ramp from an exit only to a standard two-lane exit.	\$32	X			MTC PBA 2050
22	Interchange	SCL	I-680/Jacklin Rd Interchange Improvements	Interchange improvements	\$3	X			MTC PBA 2050

#	Project Type	Co.	Title	Description	Cost Estimate (\$M)*	Short-Term** (0-4 Years)	Medium-Term (4-10 Years)	Long-Term (10+ Years)	RTP ID/ Source
23	Interchange	SCL	SR 237-Calaveras Expwy Overpass Widening	Widen the existing four lane I-680 overpass of Calaveras Expwy to six lanes with pedestrian and bicycle facilities in both directions.	\$85		X		17-07-0051
24	Auxiliary Lanes	CC	Construct Additional Auxiliary Lanes	Construct Additional Auxiliary Lanes: Alcosta Rd to Bollinger Canyon Rd, El Cerro Blvd to El Pintado Rd, El Pintado Rd to Stone Valley Rd, Stone Valley Rd to Livorna Rd, and Livorna Rd to Rudgear Rd.	\$24		X		17-02-0027
25	Managed Lanes	SCL	I-680 Express Lanes Calaveras to Scott Creek Road	Widen to add a NB express lane from Calaveras/SR 237 to Alameda County Line.	\$40		X		17-10-0058
26	Express Bus	CC	Innovate 680	I-680 Transit Improvements including Express Bus Service, ITS components, and park & ride lots along the I-680 Corridor from Dublin to Martinez.	Varies	X			17-02-0051
27	Commuter Rail	SCL	Bart Extension Phase II, Berryessa to Santa Clara	BART Extension Phase II, Berryessa to Santa Clara.	\$5,581		X		17-07-0012
28	P&R	CC	Sycamore Valley Road, Danville, P&R Expansion	Increase parking capacity of Sycamore Valley Road Park-and-Ride Lot from 240 to 356 spaces. Includes C.3 bioretention, bicycle parking, electric vehicle charging stations and green infrastructure.	\$2	X			MTC PBA 2050

* Cost estimates in current dollars

** Expected for construction to begin

*** Plan Bay Area 2050, the Bay Area's next Regional Transportation Plan/Sustainable Communities Strategy, to be adopted in 2021

Active Transportation Projects

Table 7-2 lists recommended bicycle and pedestrian projects within the I-680 Corridor such as regional trails and improvements at freeway crossings. As mentioned earlier in Chapter 4.4 Bicycle and Pedestrian Facilities, bicycle projects are based on projects from existing countywide and local active transportation plans as well as the District 4 Bike Plan. Most projects focus on freeway crossings, especially those at freeway interchange locations, because freeways often represent a major barrier within the bicycle and pedestrian networks. Local projects are included in the list if the project is on a parallel street and within the first major intersection from I-680 such as Hopyard Road, San Ramon/Foothill Road, and Warm Springs Boulevard. Local projects are also included if it is on a major road crossing I-680 or provides access to major transit hubs. Trail projects in the vicinity of I-680 are also included.

Table 7-2. Active Transportation Improvement Projects
(not in priority order)

#	Project Type	Co.	Title	Description	Cost Estimate*	Source
1	Crossing at Interchange	ALA	Scott Creek Road, Fremont	Interchange Reconstruction, ramps only, Class IV	>\$7M	D4 Bike Plan – Project List
2	Crossing at Interchange	ALA	Mission Boulevard, Fremont	Interchange Reconstruction, ramps only, Class IV	>\$7M	D4 Bike Plan – Project list
3	Crossing at Interchange	ALA	Auto Mall Pkwy, Fremont	Interchange reconstruction, ramps only, Class IV	>\$7M	D4 Bike Plan – Project List
4	Crossing at Interchange	ALA	Sunol Rd, Pleasanton	Interchange reconstruction, ramps only, Class II	>\$7M	D4 Bike Plan – Project List
5	Crossing at Interchange	ALA/CC	Alcosta Boulevard, San Ramon and Dublin	Minor Interchange Improvements (signage and striping), Class II	<\$250k	D4 Bike Plan – Project List
6	Crossing at Interchange	ALA	Washington Blvd, Fremont	Interchange reconstruction, ramps only, Class IV	>\$7M	D4 Bike Plan – Project List/Alameda County CTP Update
7	Crossing at Interchange	ALA	Stoneridge Dr, Pleasanton	Interchange reconstruction, full reconstruction, Class II	>\$7M	D4 Bike Plan – Project List
8	Bike/ped over/under-crossing	ALA	Arroyo de Laguna, Pleasanton	New separated crossing	>\$7M	D4 Bike Plan – Project List
9	Bike/ped over/under-crossing	ALA	Washington Blvd/Sabercat Trail, Fremont	New separated crossing part of Sabercat Trail (#24)	>\$7M	D4 Bike Plan – Project List
10	Bike/ped over/under-crossing	ALA	E of Palm Ave, Fremont	New separated crossing part of Mission Creek Trail (#25)	>\$7M	D4 Bike Plan – Project List
11	Local Project	ALA	Hopyard Rd	Hopyard Rd and Owens Dr Intersection Improvements	\$2.78M	City of Pleasanton CIP
12	Local Project	ALA	West Las Positas Blvd	Design West Las Positas Bicycle and Pedestrian Improvements	\$1.56M	City of Pleasanton CIP
13	Local Project	ALA	Amador Plaza Rd	Amador Plaza Rd Bike and Ped Improvements	\$1.4M	City of Dublin CIP; Bike and Ped Master Plan

#	Project Type	Co.	Title	Description	Cost Estimate*	Source
14	Local Project	ALA	Village Pkwy	Village Pkwy Bike and Ped Improvements	\$2.86M	City of Dublin Bike and Ped Master Plan
15	Local Project	ALA	City of Fremont	Fremont-Washington Project	\$22M	City of Fremont Bicycle Master Plan
16	Local Project	ALA	Warm Springs Blvd	Warm Springs Project	\$3.5M	City of Fremont Bicycle Master Plan
17	Local Project	ALA	Dublin/Pleasanton BART station and Dougherty Rd	Bike/Ped roadway in existing Alameda County ROW and Southern Pacific ROW	\$11.4M	Appx 1, Projects by County, MTC Transportation 2035 Plan
18	Trail (parallel)	ALA	City of Dublin – Iron Horse Trail	Iron Horse Trail Bridge at Dublin Blvd	\$1.5M	City of Dublin CIP
19	Trail (parallel)	ALA	City of Dublin – Alamo Creek Trail	Alamo Creek Trail Repair	\$664k	City of Dublin CIP
20	Trail (parallel)	ALA	Niles Canyon Trail	Entire Corridor - Design, environmental clearance and construction of a 6-mile Class I paved trail from Niles to Sunol through Niles Canyon. Includes two bridge structures.	\$100M	Alameda County CTP Update
21	Trail (with crossing)	ALA	Sabercat Trail	New trail from Irvington BART to Ohlone College with new I-680 Bridge and Blacow Undercrossing. Project includes an Interpretive Center on the west side of I-680 of Caltrans right of way.	\$55.8M	Alameda County CTP Update
22	Trail (with crossing)	ALA	Mission Creek Trail Gap Closure	Trail gap closure from Palm Avenue to Mission Boulevard along the existing flood control channel.	\$4.2M	Alameda County CTP Update
23	Trail (parallel)	ALA	Grimmer Greenway Trail	New trail the ACFC flood control channel north side of Grimmer Boulevard between Fremont Boulevard and Paseo Padre Parkway/Central Park.	\$5.5M	Alameda County CTP Update
24	Trail (parallel)	ALA	East Bay Greenway Trail: Irvington Station Area	Segment of the proposed East Bay Greenway extension from north of Washington Boulevard to Blacow Road in the Irvington BART Station Area.	\$2M	Alameda County CTP Update
25	Crossing at Interchange	SCL	Jacklin Rd, Milpitas	Minor Interchange Improvements (signage and striping), Class IIB	<\$250k	D4 Bike Plan – Project List

*Project cost ranges are provided for projects from the D4 Bike Plan

State Highway Operations and Protection Program (SHOPP)

SHOPP is a four-year program for operating and maintaining the State Highway System (SHS) that is updated every two years. It is Caltrans primary tool to implement the *fix-it-first* policy for the SHS. Within each SHOPP cycle, priorities are evaluated to match funding and performance measures as they relate to the goals established in the Caltrans Strategic Management Plan, such as Safety, Sustainability, Livability, Economy and Performance. As projects are selected and developed, they must also address Complete Streets, the Americans with Disabilities Act (ADA), sea level rise, and issues such as wildlife and fish passage. The SHOPP is limited to maintenance, safety, and rehabilitation projects on existing State highways and bridges, which generally does not include projects that add new traffic capacity. In addition to managing the condition of the physical infrastructure, SHOPP projects also include safety improvements, operational improvements, environmental mitigation, TOS, freight improvements and system resiliency and adaptation to climate change.

In accordance with Assembly Bill 515, Caltrans also prepares a ten-year State Highway System Management Plan (SHSMP) that is updated every two years. The SHSMP presents a performance-driven and integrated management plan for the SHS in California. It operationalizes the California Transportation Asset Management Plan (TAMP), mandated by Senate Bill 486. The 2019 SHSMP was approved on May 16, 2019 and describes the SHS needs, investments and resulting performance projects for the ten-year period spanning July 2019 to June 2029. A ten-year project book called 2019 Ten-Year Project Book has been developed to accompany the SHSMP. It lists projects to be carried out by existing and future SHOPP programs within the ten-year period.

The SHOPP project list shown in **Table 7-3** includes projects in 2020 SHOPP program to be adopted by CTC in 2020 as well as projects from the 2019 Ten-Year Project Book that accompanies the 2019 SHSMP.

Table 7-3. SHOPP Projects

County	Route	Postmile	EA/ SHOPP ID	Description/ Activity Category	Project Cost* (\$K)	SHOPP Cycle
ALA	680	M0.0/R21.9	4G113	In and near Fremont, Pleasanton, and Dublin, from 0.3 mile south of Scott Creek Road to 0.3 mile north of Alcosta Boulevard. Install ramp meters, ramp High Occupancy Vehicle (HOV) bypass lanes, and Traffic Operations Systems (TOS).	\$30,000	2018
ALA	680	M0.125	2Q760	ADA curb ramp and sidewalk improvements on ALA 680, PM M0.125; ALA 238, PM 0.74/0.82 NB	\$5,350	2020
ALA	680	M0.2/M0.9	2Q400	In Fremont, at Scott Creek Road and at 0.7 mile north of Scott Creek Road, construct RSP, regrade slope, repair drainage	\$1,700	2018
ALA	680	M2.1	0Q680	In Fremont, at Mission Boulevard, construct rock slope protection at slipout	\$5,650	2018
ALA	680	M6.44/R6.61	0P920	Mission-San José (680/238) Sep Br. No. 33-0294- Br Health	\$21,800	2020

ALA	680	R10.15	OP910	Alameda Creek Br No.33-0047 Scour	\$13,500	2020
ALA	680	R12.4/R21.9	OJ620	In and near Pleasanton and Dublin, from north of Route 84 to Alcosta Boulevard. Roadway rehabilitation.	\$142,100	2018
ALA	680/880	VAR	VAR	Install best management practices (storm water mitigation) at Route 680 & 880 within High/Very High Trash Generation Areas.	\$8,600	2020
CC	680	R0.0/R25.46	1Q720	Install TOS/RM and Fiber on ALA 680 (20/21.9 PM), CC 680 (0/25.5 PM), SOL 680 (0/0.83 PM), ALA 580 (18.8/20.8 PM), SOL 780 (0/7.2 PM)	\$131,500	2020
SCL	680	M0.0/M9.9	OJ660	In San José and Milpitas, from Route 101 to Scott Creek Road at various locations. Construct maintenance worker safety improvements.	\$12,000	2018

*Project cost are subject to change

7.2 Project Evaluation

A qualitative evaluation was conducted to gauge how a project would help meet the Corridor Goals outlined in Chapter 2 Corridor Goals, Objectives and Performance Measures. Depending on the level of impact, a project would receive a high (H), medium (M) or low (L) grade under each of the five goals.

Table 7-4 presents factors that were used to rate the projects against each goal. The evaluation was based on a qualitative application of the performance objectives and discussions with the Corridor Development Team. Generally, a project received a “high” score if it would meet most of the objectives associated with the goal. Projects were assumed to reduce VMT and increase person-throughput if they provided infrastructure or transit service that supports carpooling, taking transit, walking or biking. The largest multimodal projects in terms of size were assumed to significantly reduce vehicle demand or alleviate bottlenecks such that traffic would flow smoothly, leading to lower likelihood of rear-end collisions and improve safety. Projects that directly improved conditions on I-680 were also considered to most strongly advance the Corridor Goals.

Active transportation projects received a single score for the five Corridor Goals and were generally evaluated based on the following principles:

- New overcrossing or interchange modification that includes high quality bicycle infrastructure such as Class I trail, Class IV, and Class II enhanced facilities would receive a High score
- New or upgraded trail within the corridor area or high-quality bicycle facilities on parallel roadways would receive a Medium score
- All other active transportation projects within the Corridor would receive a Low score. This includes Class II bicycle lanes on overcrossings and parallel roadways.

Table 7-5 and **Table 7-6** present evaluation results for highway, transit and park-and-ride projects and active transportation projects, respectively. Because of the differences in assumptions and evaluation methodology, a comparison between project types would not yield a meaningful conclusion. Instead, the evaluation results mainly help demonstrate how projects would likely advance the Corridor Goals. Ratings were developed in consultation with CDT members.

Overall Assessment of Goals

Many of the projects in the recommended list received “high” scores for the goals of High Quality and Modern Infrastructure, Economic Vitality, and Accommodate Future Travel Demand. This is due to the purpose of many projects on the list to increase throughput and operational efficiency of the congested I-680 Corridor. As shown in **Table 7-4**, projects that would increase access to more affordable and sustainable modes such as transit, carpool, and biking would score high on the goals of Affordable, Accessible and Equitable and on Healthy and Sustainable. **Tables 7-5 and 7-6** illustrate that different projects score highly for different combinations of the Corridor Goals. Achieving the entire set of Corridor Goals is dependent on the implementation of the whole package of multimodal projects recommended in this chapter.

A key gap in the recommended project list are programs that would reduce travel cost for commuters and for travelers with shorter trips along the Corridor, particularly for low-income travelers. As part of development of the next Regional Transportation Plan, Plan Bay Area 2050, transportation agencies at all levels across the Bay Area are discussing opportunities for means-based fares for transit and discount programs for express lane tolls. Opportunities for incorporating these types of programs for the I-680 Corridor will be explored as part of development of regional and county transportation plans.

Table 7-4. I-680 CMCP Qualitative Evaluation Scoring Factors

Corridor Goals	Rating Factors (Qualitative) Relative to I-680
Affordable, Accessible and Equitable	<ul style="list-style-type: none"> • Increase transit frequency and improve access to transit including PNR • Increase coverage of HOV/HOT lanes • Increase access to mobility hubs and transit stations • Provide infrastructure for walking and biking
Healthy and Sustainable	<ul style="list-style-type: none"> • Provide infrastructure for carpooling, transit, walking, and cycling • Likelihood to reduce VMT • Likelihood to increase person-throughput • Likelihood to decrease collisions • Provide high quality bike facilities (Class I, Class IV, and Class II enhanced)
High Quality and Modern Infrastructure	<ul style="list-style-type: none"> • Pavement rehabilitation included in project • TOS elements included (ramp meters, smart signals, fiber-optic, etc.) • Mileage of high-quality bicycle facilities (Class I, Class IV, and Class II enhanced) • Likelihood to improve traffic flow
Economic Vitality	<ul style="list-style-type: none"> • Likelihood to increase person throughput • Likelihood to reduce travel time • Likelihood to address delay • Likelihood to improve freight efficiency • Likelihood to reduce collisions • Likelihood to improve travel time reliability
Accommodate Future Travel Demand	<ul style="list-style-type: none"> • Likelihood to increase person-throughput • Increase access to transit including park-and-ride lots • Increase coverage of HOV/HOT lanes

Table 7-5. I-680 CMCP Project Evaluation Results – Highway, Transit and P&R
(not in priority order)

#	Project Type	Co.	Title	Cost Estimate (\$M)	Affordable, Accessible and Equitable	Healthy and Sustainable	High Quality and Modern Infrastructure	Economic Vitality	Accommodate Future Travel Demand
Projects in Alameda County									
1	Interchange	ALA	I-580/I-680 Interchange improvements	\$1,500	M	M	H	H	H
2	Interchange	ALA	I-680 Overcrossing Widening and Improvements	\$19	L	L	M	L	L
3	Interchange	ALA	I-680 Sunol Interchange Modification	\$15	L	L	M	L	L
4	Interchange	ALA	SR 84/I-680 Interchange Improvements and SR 84 Widening	\$234	L	L	M	H	M
5	Interchange	ALA	Auto Mall Parkway Improvements	\$50	M	M	H	L	L
6	Managed Lanes	ALA	I-680 Express Lanes Phase II: Northbound from SCL County Line to Auto Mall Parkway	\$130	M	M	H	H	H
7	Managed Lanes	ALA	I-680 Express Lanes from SR 84 to Alcosta Blvd Phase 1: SB Express Lane	\$350	M	M	H	H	H
8	Managed Lanes	ALA	I-680 Express Lanes from SR 84 to Alcosta Blvd Phase 2: NB Express Lane	\$225	M	M	H	H	H
9	Managed Lanes	ALA	SR 262 Mission Boulevard Cross Connector Improvements	\$912	M	M	H	H	H
10	Express Bus	ALA	I-680 Express Bus to Silicon Valley	\$479	H	H	M	H	H
11	Local Bus	ALA	Fremont Transit Network Improvements	\$300	H	M	L	L	L
12	Local Bus	ALA	LAVTA On-Demand First-Mile/Last-Mile Microtransit Program	\$18	H	M	L	L	L
13	Local Bus	ALA	E14th/Mission and Fremont Blvd Multimodal Corridor – Rapid Bus and Mobility Hubs	\$330	H	M	L	L	L

#	Project Type	Co.	Title	Cost Estimate (\$M)	Affordable, Accessible and Equitable	Healthy and Sustainable	High Quality and Modern Infrastructure	Economic Vitality	Accommodate Future Travel Demand
14	Commuter Rail	ALA	Construct Irvington BART Station	\$160	M	H	M	H	H
15	Commuter Rail	ALA	ACE Near-term Corridor Improvements	\$137	M	M	H	M	H
16	Regional Rail	ALA	Altamont Corridor Vision - Mid-Term (Alameda County Portion)	\$1,351	M	H	M	H	H
17	Regional Rail	ALA	Altamont Corridor Vision - Long Term (Alameda County portion)	\$6,416	M	H	M	H	H
18	P&R	ALA	Climate Program: TDM and Emission Reduction Technology	\$150	M	L	M	M	M
19	P&R	ALA	Construct Scott Creek Road Park-and-Ride Lot	\$1.9	M	L	H	M	M
20	P&R	ALA	Construct Bernal Avenue Park-and-Ride Lot	\$1.1	M	L	H	M	M
<i>Projects in Other Counties</i>									
21	Interchange	SCL	I-680/Calaveras Interchange Improvements	\$32	L	L	M	H	M
22	Interchange	SCL	I-680/Jacklin Rd Interchange Improvements	\$3	L	L	M	H	M
23	Interchange	SCL	SR 237-Calaveras Expwy Overpass Widening	\$85	M	M	M	L	L
24	Auxiliary Lanes	CC	Construct Additional Auxiliary Lanes	\$24	L	L	M	M	M
25	Managed Lanes	SCL	I-680 Express Lanes Calaveras to Scott Creek Road	\$40	M	M	H	H	H
26	Express Bus	CC	Innovate 680	\$80	H	H	H	H	H
27	Commuter Rail	SCL	BART Extension Phase II, Berryessa to Santa Clara	\$5,581	H	H	M	H	H
28	P&R	CC	Sycamore Valley Road, Danville, Park-and-Ride Expansion	\$2	M	L	H	M	M

Table 7-6. I-680 CMCP Project Evaluation Results – Active Transportation
(not in priority order)

#	Project Type	Co.	Title	Description	Cost Estimate*	Score
1	Crossing at Interchange	ALA	Scott Creek Road, Fremont	Interchange Reconstruction, ramps only, Class IV	>\$7M	H
2	Crossing at Interchange	ALA	Mission Boulevard, Fremont	Interchange Reconstruction, ramps only, Class IV	>\$7M	H
3	Crossing at Interchange	ALA	Auto Mall Pkwy, Fremont	Interchange reconstruction, ramps only, Class IV	>\$7M	H
4	Crossing at Interchange	ALA	Sunol Rd, Pleasanton	Interchange reconstruction, ramps only, Class II	>\$7M	L
5	Crossing at Interchange	ALA/CC	Alcosta Boulevard, San Ramon and Dublin	Minor Interchange Improvements (signage and striping), Class II	<\$250k	L
6	Crossing at Interchange	ALA	Washington Blvd, Fremont	Interchange reconstruction, ramps only, Class IV	>\$7M	H
7	Crossing at Interchange	ALA	Stoneridge Dr, Pleasanton	Interchange reconstruction, full reconstruction, Class II	>\$7M	L
8	Bike/ped over/under-crossing	ALA	Arroyo de Laguna, Pleasanton	New separated crossing	>\$7M	H
9	Bike/ped over/under-crossing	ALA	Washington Blvd/Sabercat Trail, Fremont	New separated crossing part of Sabercat Trail (#24)	>\$7M	H
10	Bike/ped over/under-crossing	ALA	East of Palm Ave, Fremont	New separated crossing part of Mission Creek Trail (#25)	>\$7M	H
11	Local Project	ALA	Hopyard Rd	Hopyard Rd and Owens Dr Intersection Improvements	\$2.78M	L
12	Local Project	ALA	West Las Positas Blvd	Design West Las Positas Bicycle and Pedestrian Improvements	\$1.56M	M
13	Local Project	ALA	Amador Plaza Rd	Amador Plaza Rd Bike and Ped Improvements	\$1.4M	L
14	Local Project	ALA	Village Pkwy	Village Pkwy Bike and Ped Improvements	\$2.86M	M
15	Local Project	ALA	City of Fremont	Fremont-Washington Project	\$22M	M

#	Project Type	Co.	Title	Description	Cost Estimate*	Score
16	Local Project	ALA	Warm Springs Blvd	Warm Springs Project	\$3.5M	M
17	Local Project	ALA	Dublin/Pleasanton BART station and Dougherty Rd	Bike/Ped roadway in existing Alameda County ROW and Southern Pacific ROW	\$11.4M	L
18	Trail (parallel)	ALA	City of Dublin – Iron Horse Trail	Iron Horse Trail Bridge at Dublin Blvd	\$1.5M	M
19	Trail (parallel)	ALA	City of Dublin – Alamo Creek Trail	Alamo Creek Trail Repair	\$664k	M
20	Trail (parallel)	ALA	Niles Canyon Trail	Entire Corridor - Design, environmental clearance and construction of a 6-mile Class I paved trail from Niles to Sunol through Niles Canyon. Includes two bridge structures.	\$100M	M
21	Trail (with crossing)	ALA	Sabercat Trail	New trail from Irvington BART to Ohlone College with new I-680 Bridge and Blacow Undercrossing. Project includes an Interpretive Center on the west side of I-680 of Caltrans right of way	\$55.8M	H
22	Trail (with crossing)	ALA	Mission Creek Trail Gap Closure	Trail gap closure from Palm Avenue to Mission Boulevard along the existing flood control channel.	\$4.2M	H
23	Trail (parallel)	ALA	Grimmer Greenway Trail	New trail the ACFC flood control channel north side of Grimmer Boulevard between Fremont Boulevard and Paseo Padre Parkway/Central Park.	\$5.5M	M
24	Trail (parallel)	ALA	East Bay Greenway Trail: Irvington Station Area	Segment of the proposed East Bay Greenway extension from north of Washington Boulevard to Blacow Road in the Irvington BART Station Area.	\$2M	M
25	Crossing at Interchange	SCL	Jacklin Road, Milpitas	Minor Interchange Improvements (signage and striping), Class IIB	<\$250k	H