US 101 South Comprehensive Corridor Plan

Caltrans District 4

February 2018

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US 101

US 101 South
Comprehensive Corridor Plan

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US 101 South
Comprehensive Corridor Plan

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Executive Summary

The US 101 South Comprehensive Corridor Plan (CCP) presents a holistic approach for managing congestion, improving safety and maximizing traffic flow for all modes and incorporates measures to reduce air pollution and greenhouse gases. Key strategies include the addition of managed lanes/express lanes to maximize the efficient use of the existing highway facility for motorists, addition of competitive transit services and bicycle/pedestrian facilities to encourage mode shift from single-occupancy vehicles, improving safety for both bicyclists and pedestrians in and around the on-ramps and off-ramps access locations, as well as using technology to improve traffic flow reliability.

In 2010, Caltrans District 4 developed a Corridor System Management Plan (CSMP) for the United States (US) 101 South Corridor (Corridor) from the US 101/State Route (SR) 85 Interchange in San Jose to the San Mateo/San Francisco County Line. Since then, significant growth in both vehicular traffic and transit ridership has occurred due to the result of an increase in both population and employment within the Corridor. Meanwhile, the Road and Repair Accountability Act of 2017, also known as Senate Bill 1 (SB 1), was passed in April 2017 and provides the first significant, stable, and on-going increase in State-directed transportation funding in more than two decades.

Among the multiple programs established by SB 1 is the Solutions for Congested Corridor 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 Corridor Plan (CCP). The program also identifies the “Route 101 and Caltrain corridor connecting Silicon Valley with San Francisco” as an example of the kind of congested corridor intended for funding from the SCCP.

In response to the significant changes within the Corridor and the SCCP requirements, Caltrans in coordination with stakeholders along US 101 determined that the US 101 South Corridor is a priority route in the region, and that the CCP should be developed to capture all the anticipated changes, identify multimodal needs and recommend improvement projects and strategies. The US 101 South CCP is an update to the 2010 CSMP, and the corridor limits are expanded to include US 101 from the San Benito/Santa Clara County line to the end of the Central Freeway in San Francisco. It also includes Interstate 280 (I-280) from the US 101/I-280 Interchange to the end of I-280 in San Francisco. With input from the stakeholders, the CCP includes seven corridor goals:

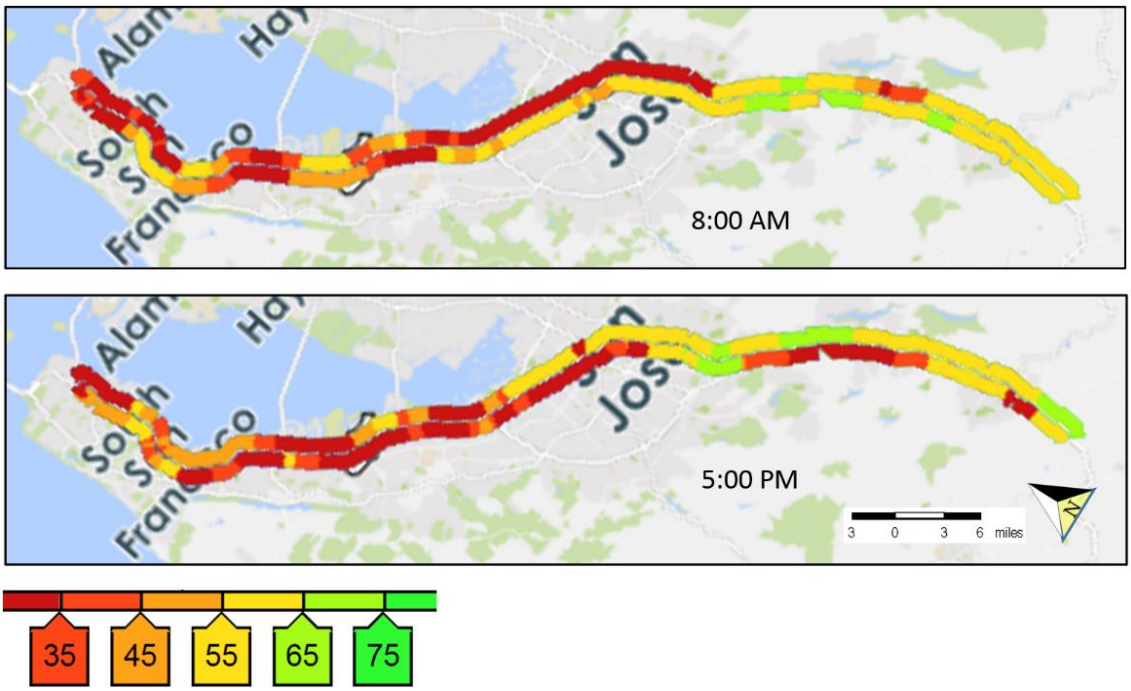
1. Provide a safe transportation system to all users within the Corridor
2. Reduce recurring freeway congestion and improve freeway efficiency in moving people
3. Improve trip time reliability within the Corridor
4. Support an accessible and inter-connected multimodal transportation system within the Corridor
5. Reduce pollutants and GHG emissions within the Corridor
6. Support economic prosperity
7. Efficiently manage transportation assets within the Corridor to protect existing and future investment

The US 101 South Corridor is a major south-north connector between Silicon Valley in the South Bay and San Francisco, two Bay Area centers of great significance to the State's economy. The portion of the Corridor running through Santa Clara, San Mateo, and San Francisco Counties is home to some of the world's most innovative and fastest-growing companies that contribute economic strength to the State and national economies. Land uses along the Corridor include State/regional parks, agricultural lands, residential uses in urban and suburban communities, commercial uses in dense urban centers and office parks as well as industrial uses and a number of institutional uses and sports venues. The Corridor serves local, regional, interregional and even international traffic of people and movement of goods. US 101 is the main access route to the San Francisco International Airport and the Norman Y. Mineta San Jose International Airport.

In addition to demographics and a list of major trip generators along the Corridor, the US 101 South CCP includes a place type analysis based on Caltrans Smart Mobility Framework and recommends appropriate transportation strategies for each place type within the Corridor. The CCP also documents Priority Development Areas and communities of concern within the Corridor as identified in Plan Bay Area 2040 (2017), the San Francisco Bay Area's Regional Transportation Plan (RTP) and Sustainable Communities Strategy (SCS).

As a multimodal transportation corridor, the US 101 South Corridor serves the movement of people and goods with a variety of transportation modes. This CCP describes public transit services, Park and Ride facilities, private commuter shuttle services, and bicycle and pedestrian facilities as critical transportation modes within the US 101 South Corridor. It identifies programmed, planned and in some cases proposed projects within the Corridor. In addition, chapter 4 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.

Figure 1 *US 101 South Congestion March 2016*



Source: INRIX

Table 1 *MTC Top 50 Congested Locations for US 101 South in 2016*

Rank	County	Direction	Daily Delay in hours	Congestion Duration	Location
1	San Francisco	US 101 NB and I-80 EB	14,120	12:20 PM – 10:05 PM	I-280 to Treasure Island Tunnel
3	Santa Clara	SB	8,290	2:10 PM–8:20 PM	Shoreline Boulevard to Oakland Road
11	Santa Clara	NB	4,630	5:35 AM–11:00 AM	Blossom Hill Road/Silver Creek Valley Road to North Fair Oaks Avenue
12	San Mateo	NB	4,400	2:45 PM–7:50 PM	Whipple Avenue to East Hillsdale Boulevard
25	San Mateo	SB	1,920	7:00 AM–11:00 AM	South of Broadway to East Hillsdale Boulevard
32	San Francisco	NB	1,480	6:50 AM–11:55 AM	Third Street to Cesar Chavez Street
38	San Mateo	SB	1,190	7:15 AM–11:00 AM	SR 84/Woodside Road to University Avenue
49	Santa Clara	NB	650	5:40 AM–8:15 AM	San Martin Avenue to East Dunne Avenue

According to the San Mateo County Economic Development Association (SAMCEDA), an estimated $5.4 billion in economic productivity is lost due to traffic congestion along the Corridor. Figure 1 shows the congestion locations on US 101 for March 2016 (Tuesdays, Wednesdays and Thursdays). Eight locations within the US 101 South Corridor were listed in the Top 50 Congested Locations of 2016 as reported by Metropolitan Transportation Commission's (MTC) Vital Signs, and they are shown in Table 1.

The CCP includes a freeway performance analysis for both existing conditions and projected future conditions. Information was mostly derived from the existing project documents and studies for the following three managed lanes projects within the Corridor.

- *US 101 Express Lanes Project in Santa Clara County* – from the US 101/Tennant Avenue Interchange in Morgan Hill (SCL, US 101, Post mile (PM) 15.1) to the San Mateo County line just north of the Embarcadero Road interchange in Palo Alto (SCL, US 101, PM 52.6).
- *US 101 Managed Lanes Project in San Mateo County* – from Rengstorff Avenue, Mountain View in Santa Clara County (SCL, US 101, PM 50.6) to East Grand Avenue, South San Francisco in San Mateo County (SM, US 101, PM 21.8).
- *San Francisco Freeway Corridor Management Study Phase 2* – from the US 101/I-380 interchange in San Bruno (SM, US 101, PM 20.7) to the US 101/I-80 interchange (SF, US 101, PM 4.2), and I-280 within San Francisco (SF, I-280, PM 0.0-7.5).

The freeway performance analysis mainly focuses on bottleneck locations, queue length and changes in some of the network performance measures such as travel times, vehicle occupancy rate, person-throughput and vehicle miles traveled, as a result of implementing the three managed lanes projects listed above.

The recommended strategies include highway and transit projects, active transportation projects and maintenance and operational projects. See Chapter 7 for short, medium and long-term highway and transit projects, bicycle and pedestrian projects and State Highway Operation and Safety Program (SHOPP) projects. Chapter 7 also includes a qualitative evaluation of short-term highway and transit projects, with respect to how they would contribute to the corridor goals. These short-term projects are all included in the Regional Transportation Plan (RTP) that was adopted in July, 2017. Tables 2 and 3 list short-term

recommended highway and transit projects as listed in the regional transportation plan that performed well in the evaluation. These projects received a medium or high grade in at least six of the seven corridor goals.

This CCP will help fulfill Caltrans statutory responsibility of identifying deficiencies within and proposing improvements to the US 101 South Corridor and serve the purpose of supporting funding applications for the SCCP.

Table 2 *Short-Term Highway Project Evaluation Top Performers**

Co.	Title	RTP ID	Goal 1	Goal 2	Goal 3	Goal 4	Goal 5	Goal 6	Goal 7
SCL SM	US 101 Express Lanes: Whipple Ave. in San Mateo County to Cochrane Rd. in Morgan Hill.**	17-07-0075	Medium	High	High	Medium	Medium	High	High
SM	Modify existing lanes on U.S. 101 to accommodate a managed lane from San Antonio Road to north of I-380	17-06-0007	Medium	High	High	Medium	Medium	High	High
SM	US 101/University Ave. Interchange Improvements	17-06-0025	High	Medium	Medium	High	Medium	Medium	Low
SF	HOV/HOT Lanes on U.S. 101 and I-280 in San Francisco	17-05-0020	Medium	High	High	Medium	Medium	High	High

Goal 1: Provide a safe transportation system to all users within the Corridor
Goal 2: Reduce recurring freeway congestion and improve freeway efficiency in moving people
Goal 3: Improve trip reliability within the Corridor
Goal 4: Support an accessible and inter-connected multimodal transportation system within the Corridor
Goal 5: Reduce pollutants and GHG emissions within the Corridor
Goal 6: Support economic prosperity
Goal 7: Efficiently manage transportation assets within the Corridor to protect existing and future investment

* Depending on the level of impact, a project would receive a high, medium or low grade under each of the seven goals.
** This project includes the Silicon Valley Express Lanes (SVEL) Program Phase 3 Project between SR 237 and the San Mateo County line, the US 101 portion of the SVEL Phase 4 Project between Bailey Avenue and the US 101/SR 85 South interchange, and future phases of the SVEL Program for the remainder portion of US 101.

Table 3 *Short-Term Transit Project Evaluation Top Performers*

Co.	Title	RTP ID	Goal 1	Goal 2	Goal 3	Goal 4	Goal 5	Goal 6	Goal 7
SCL	Implement El Camino Rapid Transit Project	17-07-0013	High	High	High	High	High	High	High
SCL	Stevens Creek Bus Rapid Transit	17-07-0059	High	Medium	Medium	High	Medium	High	Medium
SM	Add new rolling stock and infrastructure to support SamTrans bus rapid transit along El Camino Real	17-06-0029	High	High	High	High	High	High	High
SM	Introduction of Express Bus Network Serving US 101	17-10-0033	High	High	High	High	High	High	High
SF	Implement Transbay Transit Center/Caltrain Downtown Extension (Phase 1 - Transbay Transit Center)	17-10-0039	Medium	High	High	High	High	High	High
SF	San Bruno Avenue Multimodal Improvement Project	17-06-0031	High	Medium	Medium	High	Medium	Medium	Medium
SF	Arena Transit Capacity Improvements	17-05-0034	Medium	Medium	High	Medium	Low	High	High
SF	Regional/Local Express Bus to Support Express Lanes in SF	17-05-0036	Medium	High	High	High	High	High	High
SF	Southeast San Francisco Caltrain Station - Environmental	17-05-0028	High	Medium	Medium	High	Medium	High	High
SF	Muni Forward (Transit Effectiveness Project)	17-05-0014	High	Medium	Medium	High	Medium	Medium	High

Goal 1: Provide a safe transportation system to all users within the Corridor
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Chapter 1: Introduction

1.1 Comprehensive Corridor Plans

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 goals of safety and health, stewardship and efficiency, sustainability, livability and economy, system performance, and organizational excellence. 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 Santa Clara Valley Transportation Authority, the City/County Association of Governments of San Mateo County, the San Francisco County Transportation Authority and the Metropolitan Transportation Commission (MTC) to conduct system planning for the SHS.

With the passage of Senate Bill 1 (SB 1) and the introduction of the Solutions for Congested Corridor Program (SCCP), Caltrans District 4 sees a unique opportunity to update the System Planning Program and promote the legislatively required Comprehensive Corridor Plans (CCPs) as a critical component of the next generation of System Planning products as required by state legislation in an effort to include multimodal solutions that are sustainable and environmentally sensitive. CCPs are recommended for the most congested State highway corridors within the District and should include a multimodal needs analysis and identify improvement projects and strategies that would help inform decisions to program and fund transportation system needs.

Caltrans Policy Development

In response to the State Smart Transportation Initiative (January 2014)[1] and the subsequent Caltrans Improvement Program, Caltrans updated its Strategic Mission, Vision and Goals[2] and developed a Strategic Management Plan.[3] As part of the larger policy and institutional changes, a strategic effort was initiated to update the System Planning Program. The primary goal of the update is to redefine the role of System Planning within Caltrans and identify System Planning products that better serve the program.

In response to Caltrans updated Strategic Mission, Vision, and Goals, the Caltrans Strategic Management Plan 2015-2020 (SMP) was developed to link strategic goals with corresponding performance measures that the Department is responsible for achieving. The six Strategic Goals are safety and health, stewardship and efficiency, sustainability, livability and economy, system performance, and organizational excellence.

Caltrans also initiated the System Planning to Programming (SP2P) study and commissioned a Planning for Operations (P4Ops) Charter Team in 2015. SP2P study objectives included identifying gaps and opportunities in the planning to programming process, and recommending strategies to achieve a more

[1] http://www.dot.ca.gov/CIP/docs/SSTIReport.pdf
[2] http://www.dot.ca.gov/mission.html
[3] http://www.dot.ca.gov/perf/library/pdf/Caltrans_Strategic_Mgmt_Plan_033015.pdf

efficient and integrated process for reaching decisions and implementing transportation solutions. The final report dated May 15, 2017 identified gaps and recommended strategies grouped into three categories: Enhancing Relevancy (to influence programming, the planning process will need to expand collaboration internally and externally to ensure alignment with programming processes and timelines), Adding Value (to increase the value of system planning products for programming decision makers, a realistic and achievable framework is needed for developing more collaborative, comprehensive, performance-based planning), and Preparing for the Future (to reflect new and future processes and direction, the existing planning organizational framework should be reviewed to determine what processes, skills and tools need to be developed or updated). The P4Ops Charter Team consists of statewide, multi-functional, multi-agency membership to identify key P4Ops issues and oversee the development of the P4Ops Strategic Work Plan. The objective of this effort is to institutionalize P4Ops in Caltrans culture, business practices, partnerships and planning processes. A Draft Strategic Work Plan was released on October 10, 2017. The short-term recommendations focus on developing a list of high-priority operational projects, while the medium and long-term recommendations focus on establishing a P4Ops framework.

Senate Bill 1 Overview and the Solutions for Congested Corridors Program[4]

The Road and Repair Accountability Act of 2017, also known as Senate Bill 1, 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 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 CCP 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.

Projects may also 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. In order 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 high-occupancy vehicle (HOV) lanes, managed lanes, and other non-general purpose lane improvements such as auxiliary lanes, truck-climbing lanes and dedicated bicycle lanes. Project scoring includes the following criteria:

- Safety
- Congestion
- Accessibility
- Economic development, job creation and retention

[4] http://www.catc.ca.gov/programs/SB1.html

- Furtherance of State and federal ambient air quality and greenhouse gas emissions reduction standards pursuant to Assembly Bill (AB) 32 and SB 375
- Efficient land use
- Matching funds
- Project deliverability

1.2 Update to the 2010 US 101 South Corridor System Management Plan

In 2010, Caltrans District 4 developed a Corridor System Management Plan (CSMP) for the United States (US) 101 South Corridor (Corridor) from the US 101/State Route (SR) 85 Interchange in San Jose to the San Mateo/San Francisco County line.[5]

CSMPs are Transportation Planning documents that examine the mobility of an urban freeway facility in a comprehensive manner based on a performance assessment. The US 101 South CSMP covers the portion of the route extending from the US 101/SR 85 Interchange in southeast San Jose to the San Mateo/San Francisco County border. The CSMP provides both a current description of the route as well as a future concept with congestion mitigation strategies including implementing Intelligent Transportation Systems (ITS), ramp metering, auxiliary lanes, reconfiguration of interchanges to improve operations, installation of auxiliary lanes for improved local movement, and installation of High Occupancy Vehicle (HOV) and High Occupancy Toll (HOT) lanes to increase person throughput. A wide range of projects are included to show how the improved mobility from previous investments can be preserved within this Corridor. However, since a majority of the recommendations are based on the San Mateo US 101 Freeway Performance Initiative Corridor Analysis, there is generally a lack of emphasis on multimodal improvements.

Since the development of the CSMP, significant growth in both vehicular traffic and transit ridership has occurred due to a result of an increase in both population and employment within the Corridor. The San Francisco Peninsula region plays an important role in the nation's domestic economic output of both the State and the country. Silicon Valley was the first region in the country to recover from the Great Recession of 2007 to 2009 and has continued rapid economic expansion since that time. While a number of improvement projects recommended in the 2010 CSMP have been completed, many remaining projects will be implemented as part of the proposed projects such as managed lanes projects to accommodate the growth in travel demand due to employment and population growth. SB 1 identifies "Route 101 and Caltrain corridor connecting Silicon Valley with San Francisco" as an example of the kind of congested corridor meant for funding from program.

In response to the significant changes within the Corridor, Caltrans in coordination with stakeholders along US 101 determined that the US 101 South Corridor is a priority in the region, and that the CCP should be developed relative to the Corridor to capture all the changes, identify multimodal needs and recommend improvement projects. The US 101 South CCP is an update to the 2010 CSMP, and the corridor limits are being expanded to include US 101 from the San Benito/Santa Clara County line to the end of the Central Freeway in San Francisco. It also includes Interstate (I) 280 from the US 101/I-280 Interchange to the end of I-280 in Downtown San Francisco and State Route 85 segments connecting to US 101 in Santa

[5] http://d4web/tpa/SRP/files/csmp/US101S_CSMP_Fulldocument.pdf

Clara County in Mountain View and in south San Jose because these segments fall within the US 101 travel shed and generally serves the same US 101 travel market. The US 101 South CCP also intends to strengthen the multimodal nature of the corridor analysis.

Document Structure

The US 101 South CCP 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 - Recommended Strategies

Long-Term Corridor Planning

It is acknowledged among the stakeholders that one of the main goals for this CCP is to document funding needs consistent with the first round of SCCP in 2018 for shovel-ready projects in the Corridor. Therefore, the update is limited in scope and is primarily based on information, data, studies and reports that are already available. This CCP, however, will also address the longer-term planning needs of the Corridor, and will be revised and updated as needed.

1.3 Stakeholders

Current CCP 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 US 101 South CCP. The CDT included representatives from the following agencies.

- Caltrans
- Metropolitan Transportation Commission (MTC)
- City/County Association of Governments of San Mateo County (C/CAG)
- San Francisco County Transportation Authority (SFCTA)
- San Mateo County Transportation Authority (SMCTA)
- San Mateo County Transit District (SamTrans)
- Santa Clara Valley Transportation Authority (VTA)
- Peninsula Corridor Joint Powers Board (Caltrain)

Chapter 2: Corridor Goals, Objectives and Performance Metrics

The goals, objectives and performance metrics for the US 101 South CCP were developed with the input from the Corridor Development Team and represent a consensus that was reached through a collaborative process. The San Mateo County Economic Development Association (SAMCEDA) also provided performance metrics and statistics that helped gauge the impacts of transportation system performance on economic productivity, job creation and retention. Information from a variety of sources helped inform the development of this chapter. The most notable sources include:

- The Caltrans Strategic Management Plan 2015-2020
- Draft Guidelines for the 2018 Solutions for Congested Corridors Program, California Transportation Commission (CTC) , October 2017
- The San Mateo US 101 Managed Lanes Project Study Report – Project Development Support (PSR-PDS), May 2015
- Valley Transportation Authority, US 101 Express Lanes Project Report, March 2015
- San Francisco Freeway Corridor Management Study/Freeway Performance Initiative, January 2017
- Plan Bay Area 2040 Final Performance Assessment Report, July 2017

Table 4 lists the corridor goals, objectives and performance metrics. While existing sources contain data on a number of metrics (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 metric due to time and resource constraints. This comprehensive list of metrics represents targets and measurements that can be carried into CCP updates in the future, helping illustrate how the corridor performance changes over time.

Table 4 *US 101 South CCP Goals, Objectives and Performance Metrics Matrix*

Goals	Objectives	Performance Metrics
1. Provide a safe transportation system to all users within the Corridor	1.1 Reduce the number of incidents within the Corridor	• Number of collisions on freeways • Number of bicycle collisions in the Corridor • Number of pedestrian collisions in the Corridor
2. Reduce recurring freeway congestion and improve freeway efficiency in moving people	2.1 Reduce recurring delays on US 101	• Vehicle-hours of delay (VHD) • Person-hours of delay (PHD) • Average delay per vehicle • Average speed • Person-throughput • Vehicle-throughput
	2.2 Improve productivity of US 101	• Person-throughput • Vehicle-throughput
	2.3 Increase vehicle occupancy rate	• Vehicle occupancy rate • Percentage of users in HOV/Express Lanes (e.g. Percentage of single occupancy vehicle (SOVs) using Express Lanes, Percentage of 3+ carpoolers, Percentage of buses, Percentage of motorcyclists) • Travel time savings for managed lane vehicles
	2.4 Promote alternative modes of travel and reduce reliance on single occupancy vehicles	• Mode split • Transit ridership • Bike ridership • 2+ carpoolers
3. Improve trip reliability within the Corridor	3.1 Improve freeway travel time reliability	• Buffer time index (BTI)* • Planning time Index (PTI)* • Travel time during peak periods
	3.2 Reduce non-recurring delays on US 101	• Average number of incidents by type • Major incident clearing time

	3.3 Improve transit on-time performance	• Percentage of transit trips on-time
		• Number of transit operations access improvements
		  • Queue-jump lanes
		  • Transit-only lanes
		  • Signal prioritization/timing
		  • All-door boarding
		  • Pre-boarding payment stations
		• Estimated travel time savings compared with current on-time performance

Goals	Objectives	Performance Metrics
4. Support an accessible and inter-connected multimodal transportation system within the Corridor	4.1 Improved access and connections to existing or future multimodal transportation hubs	• Number of transit operations access improvements compared to number of existing transit operations access improvements • Estimated travel time savings compared with current on-time performance
	4.2 Reduce gaps in the bicycle network	• Percent of bicycle facility lane miles as a share of total lane miles by facility classification
	4.3 Reduce gaps in the pedestrian network	• Number of pedestrian walkway miles, including bike/pedestrian overcrossings
5. Reduce pollutants and GHG emissions within the Corridor	5.1 Reduce Vehicle-Miles Traveled (VMT)	• Total VMT • VMT per capita • Percentage of zero-emission vehicles
	5.2 Reduce criteria pollutants	• Emissions of criteria pollutants, including carbon monoxide (CO), lead, nitrogen dioxide (NO2), ozone (O3), particulate matter (PM), and sulfur dioxide (SO2)
	5.3 Reduce greenhouse gas emissions	• Emissions of greenhouse gases
6. Support economic prosperity	6.1 Increase freight efficiency	• Per-capita delay on freight network
	6.2 Reduce economic productivity lost due to congestion	• Lost economic productivity due to freeway congestion
7. Efficiently manage transportation assets within the Corridor to protect existing and future investment	7.1 Increase coverage of TOS elements, such as Ramp Metering, Vehicle Detection Sites, Closed-Circuit Television Cameras, and Changeable Message Signs.	• Number of TOS elements installed
	7.2 Ensure good TOS functionality	• Decrease TOS elements downtime percentage • Percentage of TOS elements inspected or maintained within the last 3 years

* Buffer time index (BTI) is defined as the amount of extra "buffer" time needed to be on-time 95 percent of the time
Planner time index (PTI) is defined as the total amount of time needed to be on-time 95 percent of the time

Chapter 3: Corridor Overview

3.1 Corridor Limits

The study area for the US 101 South Comprehensive Corridor Plan is an approximately 90-mile segment of the larger US 101 that traverses the states of California, Oregon, and Washington. For the purpose of this CCP, the US 101 South Corridor is defined as starting from the San Benito (SBT)/Santa Clara County (SCL) line, continuing through the Counties of Santa Clara, San Mateo (SM) and San Francisco (SF), and ending at the Central Freeway (US 101) at the intersection of US 101/Market Street/Octavia Boulevard. The CCP also includes a segment of I-280 between US 101 and King Street in San Francisco. The segment of I-280 is included because this segment serves the same travel markets of people and goods and is affected by similar transportation needs and issues as US 101. Within the corridor limits, US 101 intersects with multiple State highways, including SR 25, SR 152, SR 85, I-280, I-680, I-880, SR 87, SR 237, SR 109, SR 114, SR 84, SR 92, I-380 and I-80.

The Corridor also includes major parallel arterials such as Old Monterey Road/Monterey Highway in south and central Santa Clara County, Central Expressway in north Santa Clara County, Bayshore Boulevard in northern San Mateo County and San Francisco, and most importantly, El Camino Real (SR 82) that runs parallel within close proximity to US 101 between San Jose and South San Francisco. US 101 was originally built to serve increased development and travel demand between San Francisco and Santa Clara Counties, once served primarily by SR 82. Due to time and resource constraints, vehicular traffic analysis within this CCP will be limited to the freeway facilities.

Worth noting is the on-going effort called Grand Boulevard Initiative (GBI) for SR 82, a collaboration of 19 cities within Santa Clara and San Mateo counties as well as regional agencies. The goal of the GBI is to ensure that El Camino Real achieves its full potential as a place for residents to work, live, shop and play, by creating links between communities that promote walking and transit and promoting an improved and meaningful quality of life.

The US 101 South Corridor is a multimodal corridor. Various transit services are operated by several transit agencies, and bicycling and walking are all important modal options within the Corridor, providing alternatives to vehicular travel. The transit section includes existing services and planned improvements both on and parallel to the freeways. For bicycle and pedestrian travel, the discussion focuses on freeway crossings.

For the purposes of this CCP, the Corridor has been divided into seven segments, as shown below in Table 5 and Figure 2 Route segmentation is primarily based on political boundaries, lane configuration and planned and programmed projects within the Corridor.

Table 5 *US 101 South CCP Segments*

Segment	Location Description	County Route Beg. PM	County Route End PM	Configuration
1	SBT/SCL Co line – East Dunne Avenue in Morgan Hill	SCL 101 0.0	SCL 101 R16.0	4 – 6 lanes
2	East Dunne Avenue in Morgan Hill – SCL/SM Co Line	SCL 101 R16.00	SCL 101 52.55	6 – 10 lanes (0 – 4 HOV lanes)
3	SCL/SM Co Line – Whipple Avenue in Redwood City	SM 101 0.0	SM 101 6.62	8 lanes (2 HOV lanes)
4	Whipple Avenue in Redwood City – I-380	SM 101 6.62	SM 101 R20.72	8 – 10 lanes
5	I-380 – SM/SF Co Line	SM 101 R20.72	SM 101 26.11	8 – 10 lanes
6	SM/SF Co Line – end of Central Freeway at Market Street/Octavia Boulevard	SF 101 0.0	SF 101 M5.45	6 – 8 lanes
7	On I-280, US 101 – King Street in San Francisco	SF 280 R4.34	SF 280 T7.54	4 – 6 lanes

Segment 1 of the US 101 South Corridor is a four to six-lane expressway/freeway that begins at the San Benito/Santa Clara County border, and ends at East Dunne Avenue in Morgan Hill. This portion of US 101 traverses both Gilroy and a portion of Morgan Hill.

Segment 2 is a six to ten-lane freeway, with one to two High-Occupancy Vehicle (HOV) lanes in each direction. This segment begins at East Dunne Avenue and ends at the Santa Clara/San Mateo County border at the San Francisquito Creek near Palo Alto. This portion of US 101 traverses the cities of Morgan Hill, San Jose, Santa Clara, Sunnyvale, Mountain View and Palo Alto.

Segment 3 is an eight-lane freeway with one HOV lane in each direction, traversing the cities of East Palo Alto, Menlo Park and Redwood City.

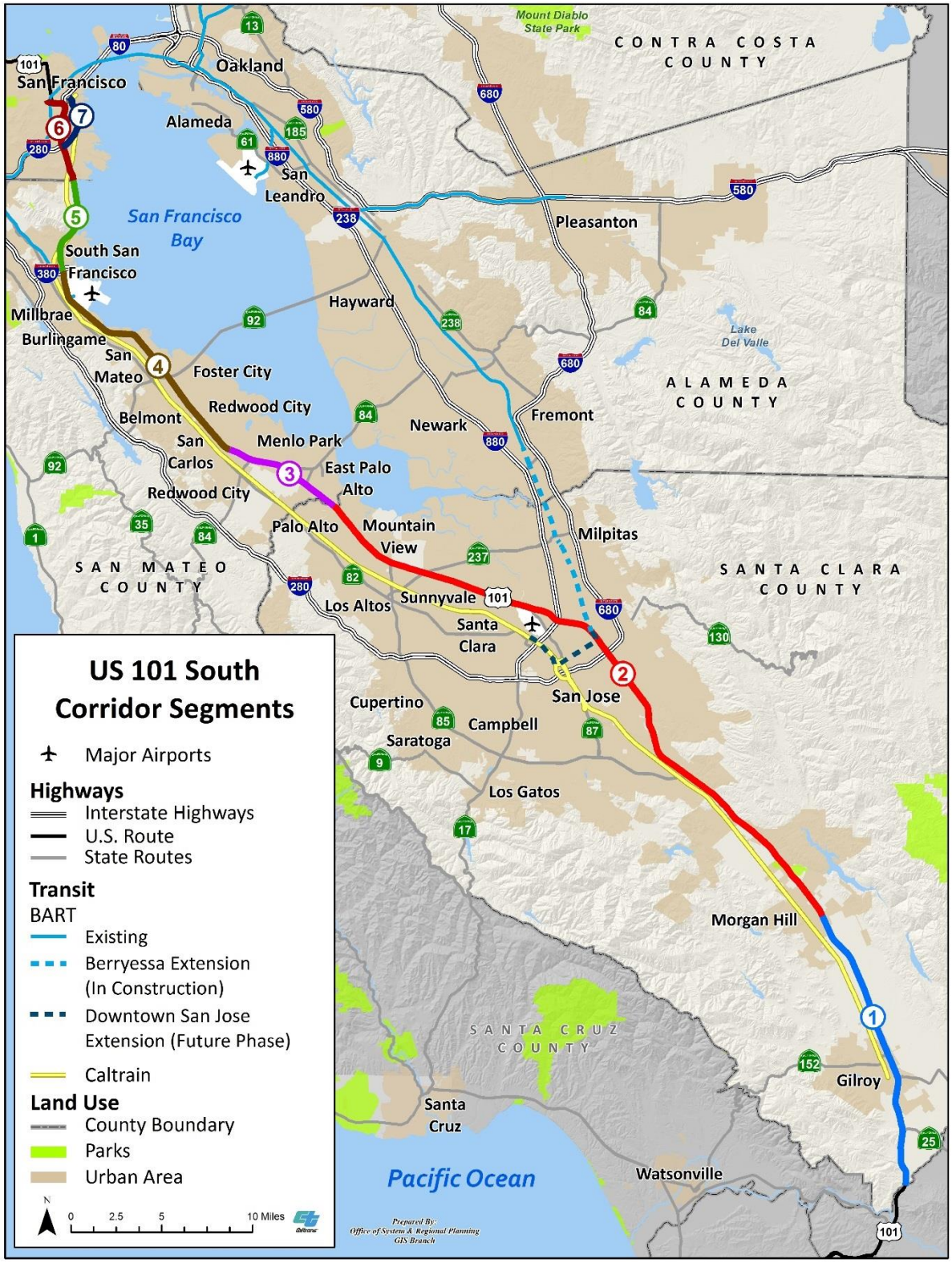
Segment 4 is an eight to ten-lane freeway that begins at Whipple Avenue and ends at the US 101/I-380 Interchange. Segment 4 traverses the cities of Redwood City, San Carlos, Belmont, San Mateo, Burlingame, Millbrae and South San Francisco.

Segment 5 is an eight to ten-lane freeway that begins at the US 101/I-380 Interchange and terminates at the San Mateo/San Francisco County border at Alana Way. This segment traverses the cities of South San Francisco and Brisbane.

Segment 6 is a four to ten-lane freeway located entirely within the City of San Francisco. Starting at the County border, it traverses a number of neighborhoods in San Francisco before terminating at the intersections of Market Street and Octavia Boulevard, and at Mission Street and South Van Ness Avenue.

Segment 7 is on I-280. It is a four to six-lane freeway that begins at the northern junction of US 101 and I-280 and terminates at the end of I-280 in San Francisco.

Figure 2 *Corridor Segmentation*



Source: Caltrans, District 4, GIS and Technical Support Branch, 2017

3.2 Route Significance

The US 101 South Corridor is primarily urban in character except for the portion between the San Benito/Santa Clara County line and San Jose in southern Santa Clara County. It is a major south-north connector between the Silicon Valley in the South Bay and San Francisco, two of the Bay Area's most significant economic centers. The US 101 South Corridor running through Santa Clara, San Mateo, and San Francisco Counties is home to some of the world's most innovative and fastest-growing companies that contribute economic strength to the State and national economies. Businesses along the Corridor account for 14 percent of California's Gross Domestic Product, twenty percent of the State's tax revenue, 1.6 million jobs, and 54 percent of the patents in California.[6]

The Corridor serves local, regional, interregional and even international traffic of people and goods. US 101 is the main access route to the San Francisco International Airport (SFO) and the Norman Y. Mineta San Jose International Airport (SJC). It links with the East Bay across the San Francisco Bay via the Dumbarton Bridge (SR 84), the San Mateo-Hayward Bridge (SR 92), and the San Francisco-Oakland Bay Bridge (I-80). The Corridor also serves as an important freight corridor for the movement of agricultural products from the Central Valley and provides access to the Ports of San Francisco and Redwood City. Unfortunately, this corridor is also home to some of the California's worst traffic congestion. Along the Corridor, an estimated $5.4 billion in economic productivity is lost due to traffic congestion, and the average delay per person has reached 67 hours per year.[7]

3.3 Route Designations

Within the US 101 South Corridor, the six segments of US 101 and the one segment of I-280 are part of the California Freeway and Expressway System. They are part of the National Highway System (NHS) and the Strategic Highway Network (STRAHNET). US 101 is functionally classified as a freeway and expressway, while I-280 is classified as an Interstate highway.

US 101 has been identified as one of the 93 statutory Interregional Road System (IRRS) routes, established in 1989 by the Blueprint Legislation (a ten-year transportation funding package created by AB 471, State Bill 300, and AB 973). The 2015 Interregional Transportation Strategic Plan (ITSP) identifies eleven Strategic Interregional Corridors statewide. US 101 is part of two Strategic Interregional Corridors: the San Jose/San Francisco Bay Area – North Coast Corridor, and the Central Coast – San Jose/San Francisco Bay Area Corridor. Within these Strategic Interregional Corridors, US 101 is identified as a Priority Interregional Highway that is critical in supporting interregional transportation and is expected to be the focus of Interregional Transportation Improvement Program (ITIP) investment in the future. I-280 is not an IRRS route and therefore is not part of the Strategic Interregional Corridors.

US 101 serves as one of the primary north-south freight routes for the San Francisco Bay Area, providing direct access to other Bay Area goods movement corridors via SR 152, I-880 and I-80. As part of the NHS and a designated Surface Transportation Assistance Act (STAA) route,[8] large trucks are allowed to operate on US 101. The California Freight Mobility Plan defines US 101 as a multimodal freight route, connecting

[6] Information provided by San Mateo Economic Development Association (SAMCEDA), November of 2017
[7] Information provided by San Mateo Economic Development Association (SAMCEDA), November of 2017
[8] The Surface Transportation Assistance Act of 1982 allows large trucks, referred to as STAA trucks, to operate on routes that are part of the National Network. The Federal Highway Administration (FHWA) provides standards for STAA trucks based on the Code of Federal Regulations Title 23 Part 658.

several maritime ports and airport facilities, and paralleling rail lines.[9] The Corridor's freight facilities are described in Chapter 5. Table 6 lists route designations for the US 101 Corridor, including I-280 in San Francisco.

Table 6 *US 101 South Route Designations*

	US 101 (Segments 1-6)	I-280 (Segment 7)
California Freeway and Expressway System[10]	Yes	Yes
National Highway System	Non-Interstate STRAHNET Route	Interstate Freeway
Strategic Highway Network	Non-Interstate STRAHNET Route	Interstate STRAHNET Route
Scenic Highway[11]	No	Eligible
Strategic Interregional Corridor	San Jose/SF Bay Area – North Coast San Jose/SF Bay Area – Central Valley – Los Angeles	N/A
Federal Functional Classification	Other Freeway or Expressway	Interstate
Truck Designation[12]	National Network (STAA)	STAA
Metropolitan Planning Organization	Metropolitan Transportation Commission (MTC)	MTC
Congestion Management Agency/ County Transportation Agency	Santa Clara Valley Transportation Authority (VTA), City/County Association of Governments of San Mateo County (C/CAG), and San Francisco County Transportation Authority (SFCTA)	SFCTA
Air District	Bay Area Air Quality Management District (BAAQMD)	BAAQMD
Native American Tribes	Ohlone	n/a
Terrain	Rolling and flat	Flat
Land Use	Urbanized in San Francisco and San Mateo counties, and urban and rural in Santa Clara County.	Urbanized

3.4 Demographics

The combined population of the counties of San Francisco, San Mateo, and Santa Clara totals nearly 3.5 million people, roughly half of the population of the entire San Francisco Bay Area. Table 7 shows demographics of the counties of Santa Clara, San Mateo and San Francisco.

Santa Clara County

Santa Clara County has the highest population – over one million more than San Francisco County – and the lowest population density among the three counties. The County has the highest median household income compared to the other two counties and a high percentage of the population that commutes by single-occupant vehicle to work. Santa Clara County has a high percentage of individuals (more than fifty

[9] Caltrans California Freight Mobility Plan (2016)
[10] California Street and Highways Code, Article 2. The California Freeway and Expressway System https://leginfo.legislature.ca.gov/faces/codes_displayText.xhtml?lawCode=SHC&division=1.&title=&part=&chapter=2.&article=2., Accessed Oct of 2017
[11] http://www.dot.ca.gov/hq/LandArch/16_livability/scenic_highways/index.htm, accessed Oct of 2017
[12] Caltrans District 4 Truck Network Map, http://www.dot.ca.gov/trafficops/trucks/truck-network-map.html

percent) whose first language is not English, resulting in an increased need for a multilingual approach when conducting public outreach during project development.

San Mateo County

San Mateo County has the smallest population of the three counties along the Corridor. It has a slightly higher population density than Santa Clara County and a relatively higher percentage of single-occupancy vehicle (SOV) commuters.

San Francisco County

San Francisco County has the highest population density of the three counties along the US 101 South Corridor. In proportion to the County's size, it has the lowest percentage of commuters who drive alone to work. The County also has the lowest median household income of the three, which coupled with population density, low car ownership rate, and low single-occupancy vehicle commuters, supports transit and Active Transportation investment in the Corridor.

Table 7 *Demographic Data of US 101 South Corridor*

	San Francisco County	San Mateo County	Santa Clara County
Total Population (2015)	840,763	748,731	1,868,149
Hispanic or Latino (2015)	128,619 (15.3 %)	189,389 (25.4 %)	497,074 (26.6 %)
White Alone (2015)	346,732 (41.2 %)	305,166 (40.9 %)	627,328 (33.6 %)
Black or African American Alone (2015)	44,879 (5.3 %)	18,471 (2.5 %)	44,980 (2.4 %)
Asian Alone (2015)	281,896 (33.5 %)	195,976 (26.2 %)	626,036 (33.5 %)
*Other (2015)	38,637 (4.6 %)	39,729 (5.3 %)	72,731 (3.9 %)
English Only (2015)	55.8%	53.7%	48.2%
Population Density (people/square mile) (2015)	17,930.54	1,671.27	1,448.18
Number of Households	383,676	272,838	646,190
Average Household Size (Owner-Occupied) (2015)	2.72	2.89	3.02
Average Household Size (Renter-Occupied) (2015)	2.1	2.78	2.86
Renter-Occupied Housing Units (2015)	224,589	153,422	268,627
Owner-Occupied Housing Units (2015)	128,698	106,289	352,836
Median Household Income (2015)	$81,294	$93,623	$96,310
Drive Alone to Work (2015)	35.9%	69.8%	76.0%
Mean Travel Time to Work (minutes)	31.7	26.8	26.3

Source: Data compiled from the American Community Survey (2015), and U.S. Census Bureau. Accessed September of 2017.

* 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 8, the automobile is the dominant commute mode in the San Francisco Bay Area, accounting for over 75 percent of all commute trips. Both San Mateo and Santa Clara Counties show greater reliance on the automobile and less on the use of alternative modes of transportation for commute purposes than the regional average. San Francisco, in contrast, shows the lowest share of auto use at around 42 percent with significant higher use of other modes.

Table 8 *Commute Choice by Mode*

Commute Mode	San Francisco County	San Mateo County	Santa Clara County	Bay Area
Auto	41.8%	78.5%	85.8%	75.5%
Transit	34.7%	10.6%	4.2%	12.0%
Walk	10.4%	2.8%	2.1%	3.6%
*Other**	7.0%	2.7%	3.2%	3.3%
Work From Home	6.2%	5.5%	4.8%	5.6%

Source: MTC Vital Signs, 2015

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

Land Uses and Major Trip Generators

The US 101 South Corridor traverses three counties with various land uses that include State/regional 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 a number of institutional uses and sports venues along the Corridor. The terrain along the Corridor ranges from rolling hills to flatlands, and a large portion of the Corridor abuts San Francisco Bay. The route serves local and regional traffic, links commuters to major employment centers of economic significance and supports interregional travel and goods movement.

Santa Clara County Trip Generators

- Norman Y. Mineta San Jose International Airport (SJC)
- Shopping centers
- Educational facilities (Stanford University, San Jose State University, Santa Clara University)
- Medical facilities and hospitals
- Major sports facilities, including Levi's Stadium and SAP Center at San Jose
- Major employers, including Google, Adobe Systems, Advanced Micro Devices, Apple, HP, eBay, Cisco Systems, Intel, Lockheed Martin, Microsoft, NASA, etc.

San Mateo County Trip Generators

- San Francisco International Airport (SFO)
- Shopping plazas
- Medical facilities and hospitals
- Major employers, including Kaiser Permanente, U.S. Department of the Interior, Genentech, Facebook, Electronic Arts, Instagram, Visa, etc.

San Francisco County Trip Generators

- Major employment centers/downtown
- Medical facilities and hospitals
- Entertainment auditoriums
- Educational facilities (University of California San Francisco, University of San Francisco, San Francisco State University)
- AT&T Park (San Francisco Giants)

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

Smart Mobility Framework

In 2010, Caltrans introduced the concept of Smart Mobility through the establishment of the Smart Mobility Framework (SMF).[13] The SMF is a transportation planning guide that includes place types to further integrate Smart Growth concepts into transportation and land use development. The SMF establishes seven place types based on the Location Efficiency of a place, which takes into consideration a community's design characteristics and its access to the regional transportation system. Within each place type, there are also sub-categories to further differentiate one place from another. The seven place types are:

1. Urban Centers
2. Close-in Compact Communities
3. Compact Communities
4. Suburban Communities
5. Rural and Agricultural Lands
6. Protected Lands
7. Special Use Areas

Place Types along the US 101 South Corridor

Figure 3 provides an example of the place types along the Corridor. The full set of place type maps can be found in Appendix A. Some modifications were made to the original place type definitions to help improve clarity in the place type analysis. For example, business parks are classified as Dedicated Use Areas (Type 4c), which is a very broad category that also includes places that do not necessarily share the same characteristics as a business park. This CCP introduces two additional place types:

- Place Type 7a, Commercial SMF: 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.
- Place Type 7b, Commercial Non-SMF: 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.

[13] http://www.dot.ca.gov/hq/tpp/offices/ocp/smf.html

As shown on the maps, Suburban Communities (Type 4) dominate much of the Corridor. In Santa Clara County, there are fewer established downtowns or transit-oriented communities. The maps show that Downtown San Jose is Urban Core (Type 1a) with relatively good transit connections and efficient land uses, while the majority of places along the US 101 South Corridor is Suburban Communities (Type 4d). Retail and small businesses are focused along Suburban Corridors (Type 4b, not shown on the maps). The maps also identify the large tracts of office parks in the South Bay (shown as Commercial SMF, Type 7a). South of San Jose there are significant areas of farmland and ranches. However, the clusters of small communities are today largely suburban in nature.

Much of the development in the Corridor between San Francisco and San Jose was originally shaped by its access to Caltrain and public transit on El Camino Real. While there has been much auto-centric infill since 1945, a string of downtowns, clustered around their railroad stations, remain vibrant. Some of the larger downtowns are classified as Close-in Centers (Type 2a), but the surrounding neighborhoods are better depicted as Suburban Neighborhoods (Type 4d) than Close-in Neighborhoods (Type 2c). Many places along El Camino Real are Close-in Corridors (Type 2b, not shown on the map) as they are well integrated with their surrounding neighborhoods, while other parts are less so, resulting in a Suburban Corridors place type designation (Type 4b).

In contrast to much of the maps, San Francisco is shown as largely urban. While most of the city locations are shown as Close-in Neighborhoods (Type 2c), there are also numerous Close in-Corridors for the commercial arterials (Type 2b, not shown on the map). Many San Francisco neighborhoods are also shaped by the transit routes connecting them to the downtown area.

Transition Areas

Caltrans SMF place type analysis helps identify areas where transition from one place type to another could potentially occur. The following transition zones do not represent "plans" for these areas. Rather, they reflect the potential changes that may occur due to transportation investment and local land use plans, such as transit projects and the designation of Priority Development Areas (PDA) by local jurisdictions. See page 27 for an in-depth discussion of PDAs. Potential transition areas include:

- Gilroy High Speed Rail Station (Suburban Center, Type 4a, to Close-in Center, Type 2a)
- San Jose Corridors (Suburban Corridors, Type 4b, to Close-in Corridors, Type 2b)
- Peninsula Communities (Suburban Communities, Type 4d, to Close-in Communities, Type 2c)

1) Gilroy High Speed Rail Station

Located thirty miles from the Diridon Station and Downtown San Jose, Gilroy holds much potential as a gateway High Speed Rail (HSR) station between the Bay Area and Monterey and Santa Cruz counties. These two counties have a combined population of over 800,000, and a Gilroy HSR station will give them nearby access to trains to Bakersfield/Los Angeles, the San Francisco Bay Area and Sacramento. Potential connecting rail services from Monterey, Salinas and further south, as well as from Watsonville and Santa Cruz, may help Gilroy transition from a Suburban Center into a Close-in Center.

2) San Jose Transit Corridors

While many neighborhoods outside downtown San Jose (Urban Core) are designated as Suburban Communities, transit improvements such as the Bay Area Rapid Transit (BART), Caltrain and Bus Rapid

Transit (BRT) will have a significant impact when integrated with PDA development, pushing the place type designations towards Close-in Compact Communities. This particularly applies to existing Suburban Corridors in the older areas with great potential to become Close-in Corridors. Older neighborhoods may also transition, albeit at a slower rate, to Close-in Neighborhoods, mainly through more accessible transit alternatives.

3) Peninsula Communities/Caltrain Stations

Many neighborhoods on the Peninsula, though relatively dense, are somewhat disconnected from their downtowns. The perceived lack of parking coupled with "big box" stores have resulted in neighborhoods that feel suburban, rather than urban. A lack of robust transit services contributes to this disconnection, resulting in less location efficiency. However, with the electrification of Caltrain and the provision of modern trains, the location efficiency of these neighborhoods will improve; even more so when local bus service improvements enhance the intermodal connectivity to Caltrain. With these transit improvements and the development of PDAs, it is assumed that many of the residential neighborhoods near Caltrain and/or El Camino will develop into Close-in Neighborhoods, while significantly more of El Camino will become Close-in Corridors.

Figure 3 *Example Place Type Map*

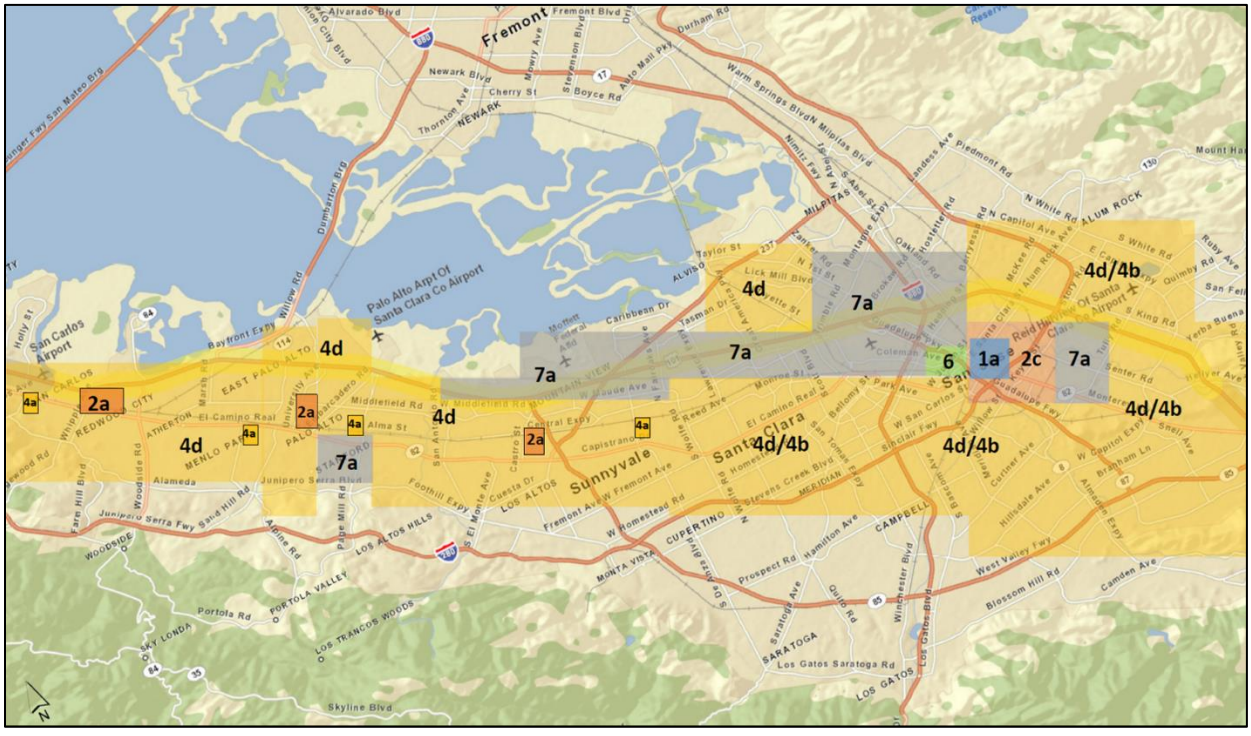


Table 9 *Place Type Descriptions*

Place Type	Place Type Description
1a. Urban Cores	Central cities and large downtown with full range of horizontally- and vertically-mixed land uses and with high capacity transit stations/corridors present or planned. Urban cores are hubs of transit systems with excellent transit coverage, service levels, and intermodal passenger transfer opportunities including convenient airport access.
2a. Close-in Centers	Small and medium sized downtowns, Transit Oriented Developments, institutions, lifestyle centers, and other centers of activity.
2c. Close-in Neighborhoods	Walkable neighborhoods with housing in close proximity to shops, services, and public facilities, as well as good multi-modal connections to urban centers, Housing density varies from medium to high. Fine-grained circulation network of streets with high comfort for pedestrians and bicyclists.
4a. Suburban Communities - Centers	Mid-size and small downtowns, lifestyle centers, or other activity centers embedded within suburban communities.
4b. Suburban Communities – Corridors	Arterial streets with a variety of fronting development types, frequently characterized by inadequate walk and bike environments, low land use efficiency and poor aesthetics.
4d. Suburban Communities - Neighborhoods	Residential subdivisions and complexes including housing, public facilities and local-serving commercial uses, typically separated by arterial corridors.
6. Protected Lands	Lands protected from development by virtue of ownership, long-term regulation, or resource constraints.
7. Special Use Areas	Large tracts of single use lands that are outside of, or poorly integrated with, their surroundings.

Transportation Investment Recommendations

Place Types help determine transportation needs. SMF identifies transportation strategies to each place type so a greater location efficiency can be achieved and more Smart Mobility benefits can be realized in the future. Table 10 lists Place Types along the Corridor and identifies examples of transportation strategies. See Appendix A.2 for a complete list of strategies.

Table 10 *Transportation Strategies Examples*

Segment	Place Type	Transportation Strategies
1	4A: Suburban Communities – Centers 4D: Suburban Communities – Neighborhoods	• Promote transit service and rideshare programs near concentrated employment centers
	5B: Rural and Agricultural Lands – Rural Settlements and Agricultural Lands	• Network connectivity enhancements within towns
2	1A: Urban Centers – Urban Cores	• Convenient opportunities for multi-modal and transit transfers for all urban center users
	2A: Close-In Compact Communities – Close-In Centers 2C: Close-In Compact Communities – Close-In Neighborhoods	• High capacity transit
	4A: Suburban Communities - Centers 4B: Suburban Communities - Corridors 4D: Suburban Communities – Neighborhoods	• 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
	5B: Rural and Agricultural Lands – Rural Settlements and Agricultural Lands	• Inside towns, walking and bicycling facilities focused on connectivity and comfort
	6: Protected Lands	• Where public access and recreational use is permitted, bicycle facility, and trail projects
	7A: Special Use Areas – Commercial SMF 7B: Special Use Areas – Non-Commercial SMF	• Provide access and connectivity improvements that are specific to use and location
3	2A: Close-In Compact Communities – Close-In Centers	• Addition of HOV systems on freeways that provide access to urban centers.
	4A: Suburban Communities - Centers 4D: Suburban Communities – Neighborhoods	• Promote transit service and rideshare programs near concentrated employment centers
	7A: Special Use Areas – Commercial SMF	• Provide access and connectivity improvements that are specific to use and location
4	2A: Close-In Compact Communities – Close-In Centers	• Transit centers and high capacity transit stations accessed primarily by multi-modal travel
	4A: Suburban Communities - Centers 4D: Suburban Communities – Neighborhoods	• Invest in projects that improve connectivity leading to shorter average trip lengths and increased non-auto mode share
	7A: Special Use Areas – Commercial SMF	• Provide access and connectivity improvements that are specific to use and location
5	4A: Suburban Communities - Centers 4D: Suburban Communities – Neighborhoods	• Invest in projects that improve connectivity leading to shorter average trip lengths and increased non-auto mode share
	6: Protected Lands	• Where public access and recreational use is permitted, bicycle facility, and trail projects
	7A: Special Use Areas – Commercial SMF 7B: Special Use Areas – Non-Commercial SMF	• Provide access and connectivity improvements that are specific to use and location
6	1A: Urban Centers – Urban Cores	• Convenient opportunities for multi-modal and transit transfers for all urban center users
	2B: Close-In Compact Communities – Close-In Corridors 2C: Close-In Compact Communities – Close-In Neighborhoods	• High capacity transit • Local transit with excellent coverage providing connections to high capacity transit lines
	4D: Suburban Communities – Neighborhoods	• Invest in complete streets and safe routes to school measures
7	1A: Urban Centers – Urban Cores	• Direct service by high capacity and high-speed transit serving local and regional destinations
	2B: Close-In Compact Communities – Close-In Corridors 2C: Close-In Compact Communities – Close-In Neighborhoods	• High capacity transit • Local transit with excellent coverage providing connections to high capacity transit lines

Plan Bay Area 2040

Plan Bay Area 2040 (PBA 2040), the long-range transportation and land-use strategy and Regional Transportation Plan (RTP) for the Bay Area, 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. The Metropolitan Transportation Commission produced the RTP 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. Plan Bay Area 2040 (2017), the strategic update, guides transportation investments and land-use decisions through 2040.

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 Great Recession.[14]

There are over 100 projects and programs that have been incorporated into the RTP along the US 101 South Corridor. These projects can be found in Chapter 7.

Priority Development Areas and Priority Conservation Areas

The identification and establishment of local Priority Development Areas will help focus eighty percent of new housing and 66 percent of new jobs forecast for the region. PDAs are locally designated areas within existing communities that have been identified and approved by local cities or counties for future growth. These areas are typically more accessible to transit, jobs, shopping and other services. MTC produced the RTP in concert with ABAG. Within the Plan's horizon year (2040), population estimates for the Bay Area include two million new residents and a total population exceeding nine million. PDAs in the counties of San Francisco, San Mateo, and Santa Clara help accommodate a large share of the forecast growth in the Bay Area region. Below the complete list of PDAs with US 101 at their borders.

Santa Clara County PDAs

- North Bayshore (Mountain View)
- North San Jose (San Jose)
- Berryessa Station (San Jose)
- East Santa Clara/Alum Rock Corridor (San Jose)
- Cottle Transit Village (Hitachi) (San Jose)
- Downtown (Morgan Hill)
- Downtown (Gilroy)

San Mateo County PDAs

- San Francisco/San Mateo Bi-County Area
- Downtown (South San Francisco)
- Transit Corridors (San Bruno)

[14] MTC, Plan Bay Area 2040 Draft (2017): http://2040.planbayarea.org/forecasting-the-future

- Transit Station Area (Millbrae)
- Rail Corridor and Grand Boulevard Initiative (San Mateo)
- Broadway/Veterans Boulevard Corridor (Redwood City)

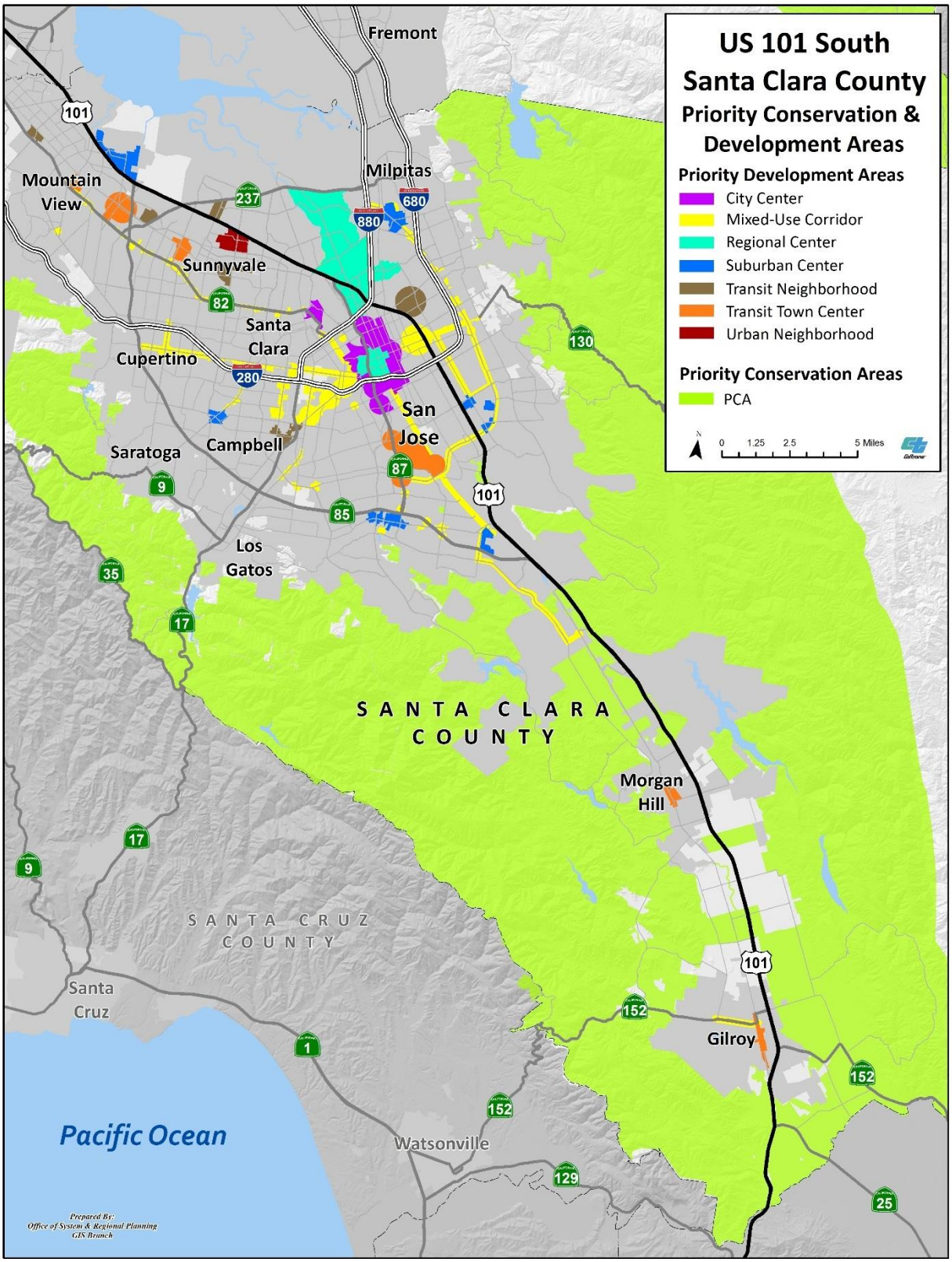
San Francisco County PDAsFel

- Market-Octavia/Upper Market
- Eastern Neighborhoods
- Mission Bay
- Bayview/Hunters Point Shipyard/Candlestick Point
- Port of San Francisco, and
- San Francisco/San Mateo Bi-County Area

Priority Conservation Areas (PCAs) are open spaces that provide agricultural, natural resource, scenic, recreational, and/or ecological values and ecosystem functions. These areas are identified through consensus by local jurisdictions and park/open space districts as lands in need of protection due to pressure from urban development or other factors. PCAs are categorized by four designations: Natural Landscapes, Agricultural Lands, Urban Greening and Regional Recreation.

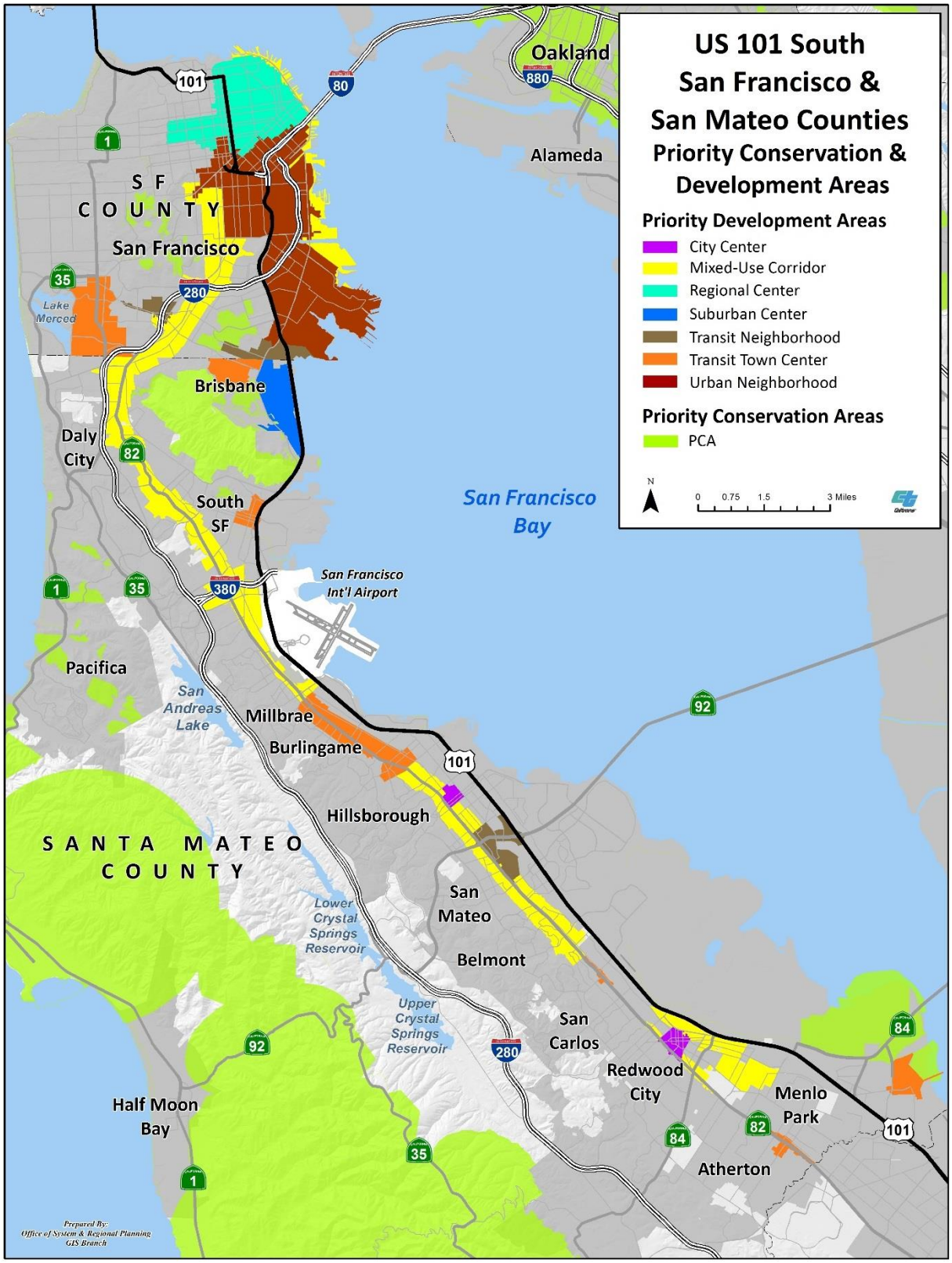
See Figure 4 and 5 on the next two pages for PDAs and PCAs along the US 101 South Corridor.

Figure 4 *Priority Development and Priority Conservation Areas Santa Clara County*



Source: Caltrans, District 4, GIS and Technical Support Branch, 2017

Figure 5 *Priority Development and Priority Conservation Areas San Francisco and San Mateo Counties*



Source: Caltrans, District 4, GIS and Technical Support Branch, 2017

Communities of Concern

Communities of Concern have been identified using MTC's online GIS portal.[15] The data has been conveyed via the use of census tracts along the US 101 South Corridor. MTC uses the term "Communities of Concern" to represent a cross section of the population that is considered disadvantaged or vulnerable to current conditions and potential impact of growth and urban development. PBA 2040 defines disadvantaged populations as having a high concentration of minority and low-income households, in addition to a concentration of three or more additional factors.[16] The eight factors to identify communities of concern include:

1. Minority
2. Low Income (<200% Federal Poverty Level)
3. Limited English Proficiency
4. Zero-Vehicle Household
5. Seniors 75 Years and Over
6. People with Disability
7. Single-Parent Family
8. Severely Rent-Burdened Household

Additional analysis has been conducted to identify communities of concern via CalEnviroScreen 3.0.[17] CalEnviroScreen is a screening methodology that is used to identify communities burdened by multiple sources of pollution. The tool utilizes various sources of data as shown below to determine the level of risk a community faces:

- Pollutants, such as Particulate Matter 2.5, Ozone, diesel emissions, pesticides, toxic releases, traffic, poor drinking water, brownfield remediation (cleanup) sites, groundwater threats, hazardous waste, impaired water, and solid waste
- Asthma, low birth rates, cardiovascular risks, education levels, linguistic Isolation, poverty, unemployment rate, and housing burden

High Risk Cities/Areas within the US 101 South Corridor include:

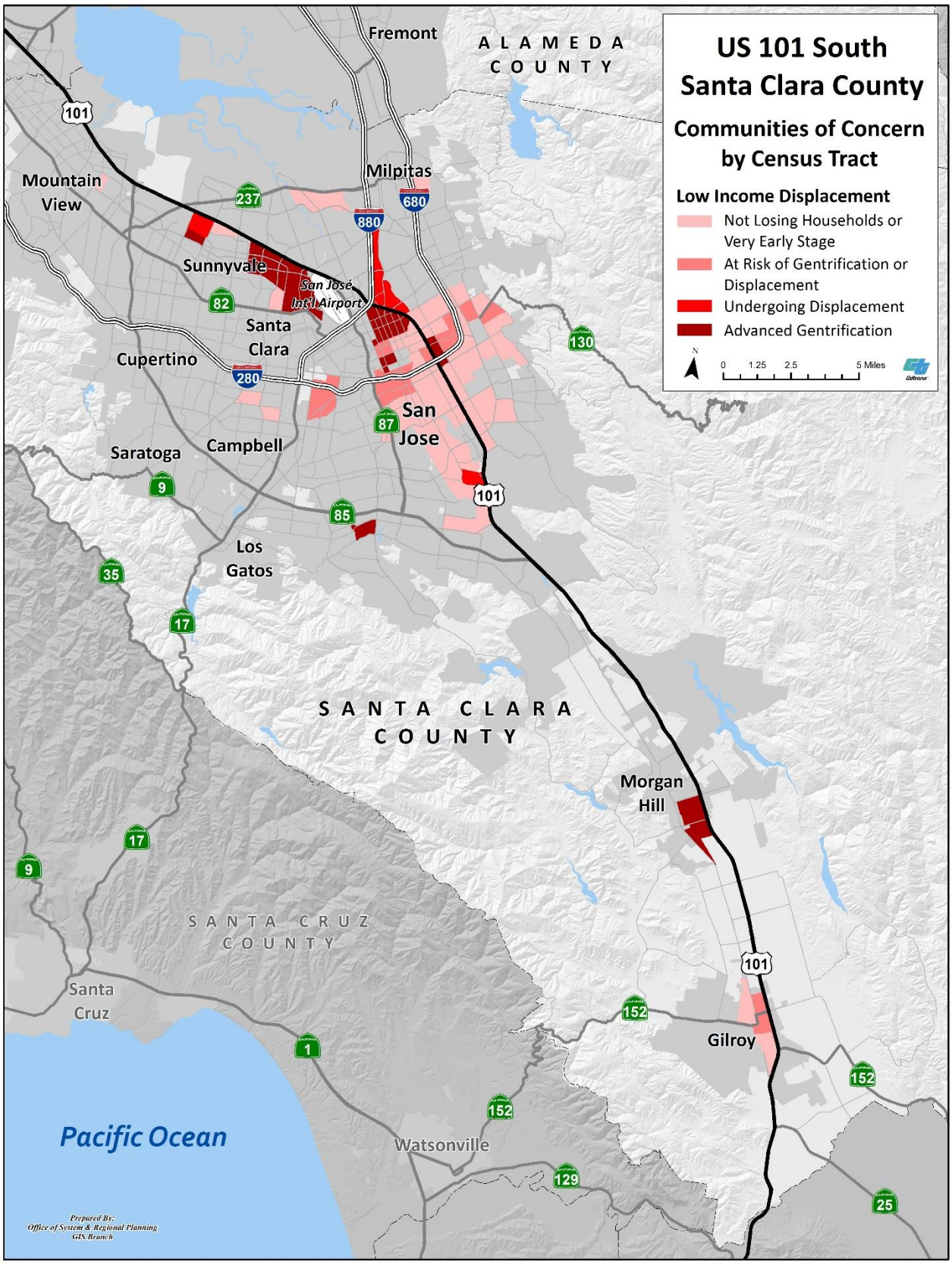
Santa Clara County: Gilroy, San Martin, South East San Jose, and Santa Clara, see Figure 6

San Mateo County: East Palo Alto, Redwood City, San Bruno, South San Francisco, and Brisbane, see Figure 7

San Francisco County: Hunters Point, Mission District, Potrero District, and at the ends of both I-280 and the US 101 Central Freeway, see Figure 7

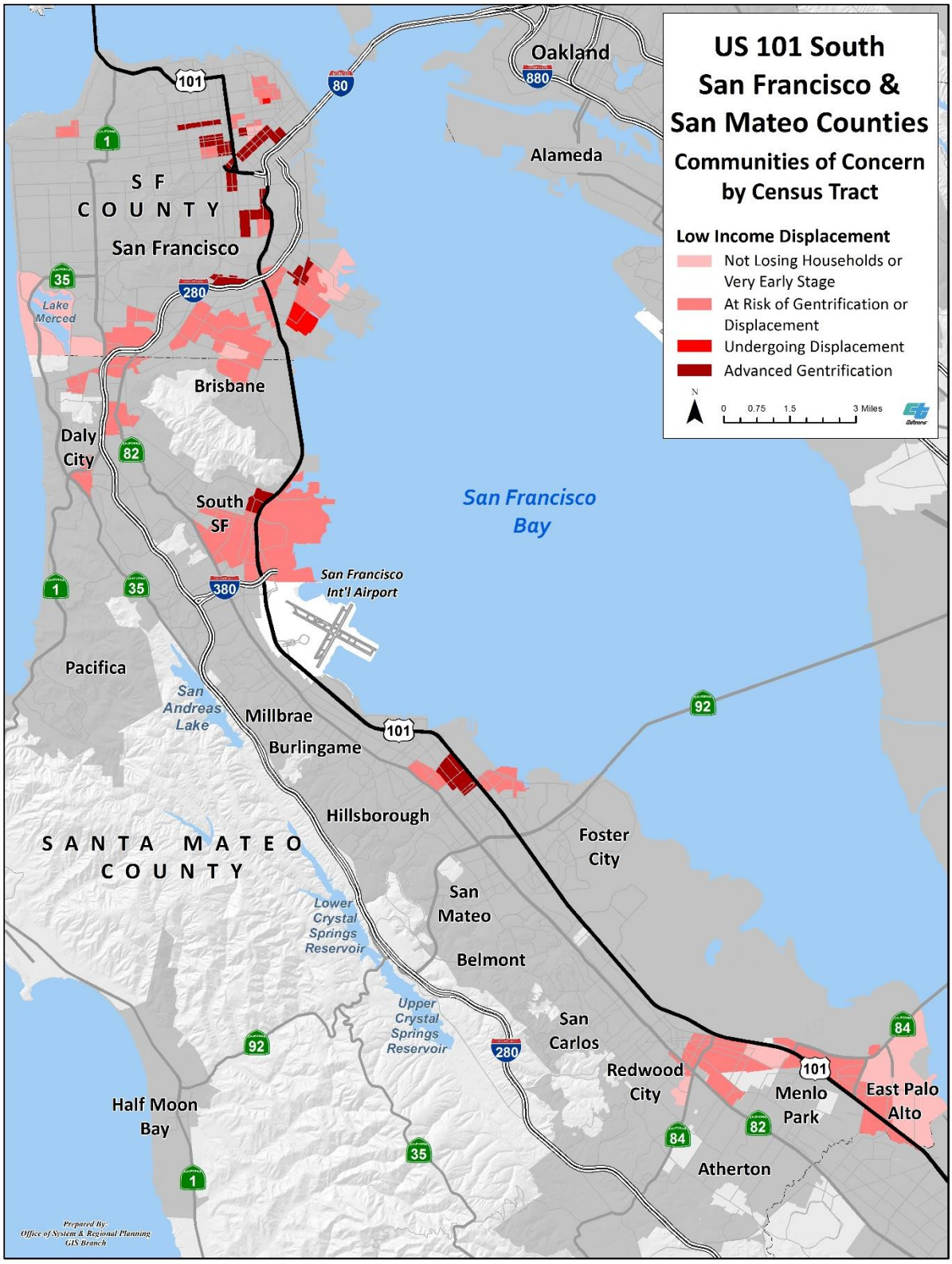
[15] http://mtc.maps.arcgis.com/home/webmap/viewer.html?webmap=7ce7b5ba22514340bb7dffdc6bdc4287
[16] http://www.planbayarea.org/2040-plan/plan-details/equity-analysis
[17] https://oehha.ca.gov/calenviroscreen/report/calenviroscreen-30

Figure 6 *MTC's 2017 Communities of Concern Santa Clara County*



Source: MTC, 2017

Figure 7 *MTC's 2017 Communities of Concern San Francisco and San Mateo Counties*



Source: MTC, 2017

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 information 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 and determination. Table 11 shows the environmental considerations within the US 101 South Corridor.

For the purposes of the CCP, the most important environmental considerations for funding include "direct mitigation," restoration, and/or protection of critical habitat and open space.

Table 11 *Environmental Consideration for the US 101 South Corridor*

	Segment						
	1	**2**	**3**	**4**	**5**	**6**	**7**
Section 4(f) Land[18]	*Low*	*Medium*	*Low*	*High*	*High*	*Low*	*Low*
Coastal Zone	*No*	*No*	*No*	*Yes*	*Yes*	*No*	*Yes*
Farm/Timberland[19]	*Yes*	*Yes*	*No*	*No*	*No*	*No*	*No*
Floodplain[20]	*100 year*	*100 year*	*100 Year*	*100 Year*	*100 year*	*n/a*	*n/a*
Climate Change/Sea Level Rise	*Low*	*Low*	*High*	*High*	*High*	*Low*	*High*
Waters and Wetlands	*Low*	*Medium*	*Low*	*Medium*	*Medium*	*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 counties that surround San Francisco Bay: Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, southwestern Solano, and southern Sonoma counties. It is governed by a 24-member Board of Directors composed of locally-elected officials from each of the nine Bay Area counties, with the number of board members from each county being proportionate to its population.

Any project's design concept, scope, and open-to-traffic date assumptions need to be consistent with the regional emissions analysis performed for the current Regional Transportation Plan (RTP) and Transportation Improvement Program (TIP).

Environmental Documentation

Caltrans is the lead agency for preparing the environmental document in compliance with the National Environmental Protection Act (NEPA) and the California Environmental Quality Act (CEQA) for the San Mateo US 101 Managed Lanes Project. The NEPA process is ongoing. Caltrans files a Notice of Preparation for the Environmental Impact Report/Environmental Assessment (EIR/EA) with the State Clearinghouse. The filing of the Notice of Preparation begins a 30-day scoping period. The Notice of Preparation is filed

[18] CDFW Owned & Operated Lands & Conservation Easements, https://map.dfg.ca.gov/bios/, accessed Oct of 2017
[19] ftp://ftp.consrv.ca.gov/pub/dlrp/FMMP/pdf/statewide/2012/fmmp2012_wallsize.pdf, accessed Oct of 2016.
[20] NFHL 1% (100 year) Flood, https://map.dfg.ca.gov/bios/

with the California Governor's Office of Planning and Research State Clearinghouse, who is responsible for providing public outreach. The purpose of the outreach is to inform the public about the status of the project and to request public comments regarding the scope of the environmental document and technical studies (which are available for review upon request).

The Final EIR/EA includes responses to comments received on the Draft EIR/EA and identifies build alternatives. When a project is approved, a Notice of Determination is published for compliance with CEQA, and Caltrans will decide whether to issue a Finding of No Significant Impact (FONSI) or require an Environmental Impact Statement for compliance with NEPA. A Notice of Availability of the FONSI will be sent to the affected units of federal, State, and local government, and to the State Clearinghouse in compliance with Executive Order 12372.

Necessary permits and approvals from environmental agencies include:

- *Federal Highway Administration*: Concurrence with project's conformity to Clean Air Act and other requirements
- *U.S. Fish and Wildlife Service:* Section 7 consultation for threatened and endangered species.
- *State Historic Preservation Officer:* Concurrence on findings with respect to historic resources and Section 106 requirements.
- *U.S. Army Corps of Engineers:* Concurrence on delineation of waters of the United States and Section 404 permit for placement of fill within waters of the United States.
- *San Francisco Bay Regional Water Quality Control Board:* Section 401 Water Quality Certification; National Pollutant Discharge Elimination System approval for work greater than one acre.
- *San Francisco Bay Conservation and Development Commission (BCDC):* A BCDC permit will be required for work within the Bay or within 100 feet of the shoreline.
- *Bay Area Air Quality Management District:* Air quality and TIP conformity determination to be made by MTC.

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-18-12 has directed State agencies to reduce GHG emissions by twenty percent by 2020.[21] Observations of sea levels along the California coast, and global climate models indicate that California's coast will experience rising sea levels over the next century and beyond (unless GHG emissions are dramatically reduced from current levels). The effects of SLR will have impacts on all modes of transportation located near the coast, significantly increasing the challenge to transportation managers in ensuring reliable transportation routes are available. Inundation of even small segments of the intermodal transportation system can render much larger portions impassable, disrupting connectivity and access to the wider transportation network.[22] Caltrans seeks to address SLR and GHG reductions by partnering with local and regional stakeholders to promote climate change policies on the SHS and local streets and roads projects.

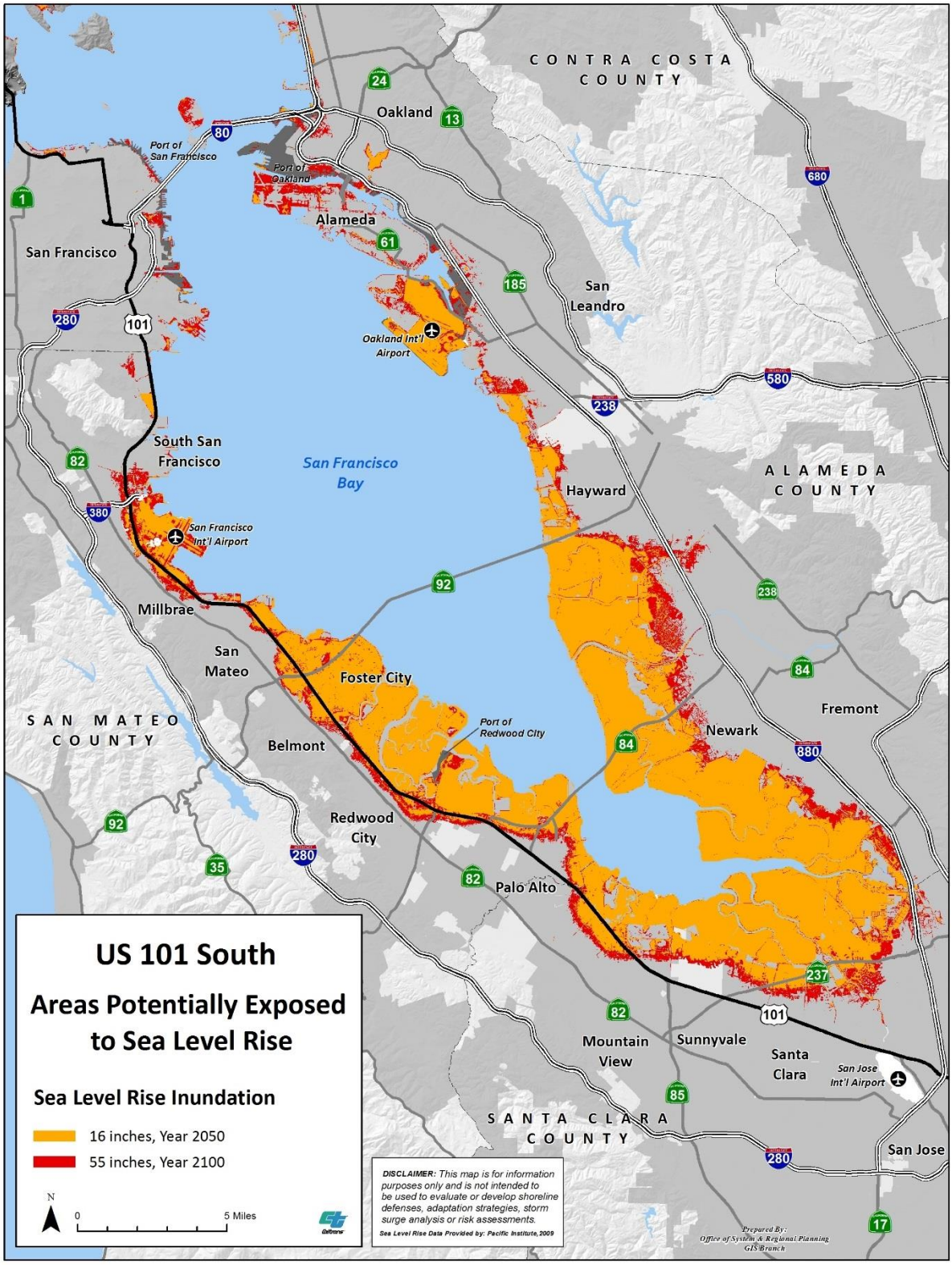
[21] Caltrans *Director's Policy-30, Climate Change*, June 2012
http://www.dot.ca.gov/hq/tpp/offices/orip/climate_change/documents/DP-30_Climate_Change.pdf#zoom=75
[22] Caltrans *Guidance on Incorporating Sea Level Rise*, May 2011.
http://www.dot.ca.gov/hq/tpp/offices/orip/climate_change/documents/guide_incorp_slr.pdf#zoom=65

US 101 in the counties of San Mateo and Santa Clara, and I-280 in San Francisco County are highly vulnerable to the effects of rising sea levels. If left unmanaged, the impacts from future flooding and coastal erosion could pose considerable risks to life, safety, critical infrastructure, natural and recreational assets, and the economy. In San Francisco County, about one mile of I-280 is vulnerable to six-foot inundation levels. A vast portion of the US 101 Corridor in San Mateo County is expected to be impacted during major flooding events. About 18 miles of US 101 in San Mateo County will see flooding with two feet of sea level rise, or major rain/flood events. Santa Clara County is forecast to experience flooding for about one mile of US 101 during a two-foot inundation event. See Table 12 below for more information about specific portions of the US 101 South Corridor that are projected to be impacted by flooding events of two different magnitudes. Figure 8 also illustrates the locations of these areas.

Table 12 *Portions of US 101 South Corridor Susceptible to Sea Level Rise*

Sea Rise Level	County	Route	Post Mile Begin	Post Mile End
2-foot	Santa Clara	101	52.55	52.55
			49.8	52.1
	San Mateo		23.8	26.0
			16.7	21.6
			13.8	16.4
			9.8	13.4
			5.5	8.9
			4.3	5.0
			2.9	3.1
	San Francisco	280	T7.2	T7.2
			5.5R	5.5R
6-foot	Santa Clara	101	49.4	52.55
	San Mateo		2.9	21.7
	San Francisco	280	R5.2R	R5.6R
			T7.1	T7.543

Figure 8 *Sea Level Rise Map*



Source: Caltrans, District 4, GIS and Technical Support Branch, 2017

Chapter 4: Multimodal Facilities

As a multimodal transportation corridor, the US 101 South Corridor serves the movement of people and goods with a variety of transportation modes. This chapter describes public transit services, Park and Ride facilities, the private commuter shuttle services, and pedestrian and bicycle facilities as critical transportation modes within the US 101 South 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.

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 level, the Bay Area's Metropolitan Planning Organization, MTC, has developed policy and guidance on Complete Streets as well.

4.1 Transit Services

A number of public transit agencies provide services within the US 101 South Corridor. Some agencies are specialized in one type of service, such as rail, while others provide a variety of transit services.

Santa Clara Valley Transportation Authority

VTA operates and provides bus and light rail service to fifteen cities and towns in Santa Clara County for its 1.9 million County residents.[24] In addition, VTA is also a partner in providing other transportation services. These services include commuter rail, inter-county express bus lines, and rail feeder services such as the Altamont Corridor Express (ACE) with Alameda County, Caltrain Intercity Rail Service with counties of San Mateo and San Francisco, Dumbarton Express with Alameda-Contra Costa Transit District (AC Transit), Highway 17 Express with Santa Cruz County, and the soon to open Silicon Valley BART commuter rail service in June 2018 with the BART District. VTA also manages paratransit and shuttle services. In FY 2016, VTA carried a combined total ridership of 54,745,000 passengers, one percent less than in FY 2015 (approximately 55.3 million passengers) which was consistent with transit ridership in the region, but an increase of almost 1.5 percent (54 million passengers) compared to FY 2014. [25]

VTA currently operates five Express Bus Lines (104, 120, 121, 122 and 168) that travel directly on US 101 as part of its routes and three routes that operate along major parallel arterials to US 101 (162, 182 and 168). Other routes that operate within the US 101 Corridor are as follows: four Local Lines (22, 32, 72 and 73), one Bus Rapid Transit Line (522), one Limited Line (304) and one Community Bus Line (42). These bus lines provide service along a fifty-mile corridor from the City of Palo Alto to the City of Gilroy.[26]

[23] http://www.dot.ca.gov/hq/tpp/offices/ocp/docs/dd_64_r2.pdf
[24] US Census Bureau, July 2016 (https://www.census.gov/quickfacts/fact/table/santaclaracountycalifornia/PST045216)
[25] VTA FY 2016 Annual Transit Operations Performance Report
[26] VTA Bus-Rail Map (http://www.vta.org/getting-around/maps/bus-rail-map, January 2016)

VTA also operates a 42-mile Light Rail Transit System with three light rail lines (Mountain View-Winchester Line, Alum Rock-Santa Teresa, and Almaden-Ohlone/Chynoweth) serving 62 stations and 21 Park & Ride lots with segments operating within the US 101 South Corridor.[27]

Within the US 101 South Corridor, VTA is currently undertaking or participating in a number of transportation studies and plans, including:

- El Camino Real Bus Rapid Transit (BRT) Project
- BART Silicon Valley Phase II Extension Project (See the BART section below)
- Gilroy Station Area Plan (Implementation)
- Diridon Station Area Plan (Implementation)
- Santa Clara Station Area Plan
- Lawrence Station Area Plan (Implementation)
- Mountain View North Bayshore Precise Plan (Implementation)
- Santa Clara Transportation Technology Strategic Plan

<u>San Mateo County Transit District</u>

The San Mateo County Transit District operates SamTrans fixed-route and paratransit bus services, as well as Caltrain fixed-rail service. SamTrans currently operates 79 fixed-route bus routes throughout the twenty municipalities in San Mateo County. Of these routes, 39 are community routes associated with school service, 38 routes are local routes, many of which connect to BART or Caltrain stations, and two are mainline routes providing long-distance transit service. SamTrans currently runs one express bus service (the KX route) which operates on US 101 and connects San Francisco with the Redwood City Transit Center. In addition, SamTrans operates three late night "owl" service routes. SamTrans carried approximately 12.7 million passengers in Fiscal Year (FY) 2016. This figure is equivalent with passengers in FY 2014 but a 2.8 percent decrease compared to ridership in FY 2015 (13.1 million).[28]

US 101 Express Bus Feasibility Study

SamTrans is currently conducting a US 101 Express Bus Feasibility Study (EBFS) that builds on the Express Bus Proof of Concept (POC) Study completed in the summer of 2017. The EBFS aims to explore and develop a regional express bus master plan for the Peninsula, including San Mateo, San Francisco, and Santa Clara counties. The EBFS is a more detailed evaluation of the financial and operational needs of a regional express bus network operating on US 101, with and without a potential managed lane on the freeway. The POC Study estimated increase in new system wide ridership at 9,000 to 11,000 daily passengers across nine new express bus routes and a daily mode shift of two to four percent from single occupancy vehicles (SOV) to transit.

The EBFS launched in late April 2017 and is targeting a final report in mid- to late-2018 with a goal of having limited express bus service in operation at the time of the opening of the managed lanes on US 101 in 2021. A first round of public outreach was held in the summer of 2017 with events in San Mateo, San Francisco, and Santa Clara counties. A second round of outreach will be held in the spring of 2018.

[27] VTA Short Range Transit Plan FY2014-2023, (http://www.vta.org/srtp)

[28] http://www.samtrans.com/Assets/_Planning/2017-2026+SamTrans+Short+Range+Transit+Plan.pdf

San Francisco Municipal Transportation Authority

The San Francisco Municipal Railway (Muni) transit system, comprised of buses, historic street cars, light rail vehicles, and cable cars, provides local service within the City of San Francisco and is operated by the San Francisco Municipal Transportation Authority (SFMTA). There are approximately 3,500 transit stops maintained by SFMTA within San Francisco. While most routes terminate within the city boundaries, some service is available into Daly City, terminating at or near the Daly City BART station. As of August 2017, Muni averaged 725,080 weekday boardings, representing a decrease from 743,020 weekday boardings during August of 2016[29].

Some of the longest Muni bus routes include Lines 8, 8AX, 9, 9R, 14, 14R, 29, and 49. Bus lines 8, 8AX, 8BX, 9, and 9R run from downtown San Francisco to Visitacion Valley parallel to US 101. Lines 14, 14R, and 49 operate on surface streets parallel to BART. Of these lines, 8AX, 8BX, and 14X use the freeway for a portion of their route. Line 29 begins in the Bayview District and crosses both US 101 and I-280 in the southern portion of this area, and continues northeast to serve the Sunset and Richmond Districts, before terminating in the Presidio.

The Muni Metro light rail service operates both street level and subway service underneath Market Street. The light rail lines J-Church and M-Ocean View have the same terminal points (Embarcadero Station and Balboa Park Station), but the lines branch out between Market/Church Street and Balboa Park serving different parts of the city between terminals. The KT line, which also has a terminus at the Balboa Park Station, begins with the K-Ingleside line heading towards the West Portal Muni Metro Station. The service then changes to the KT line, which continues towards the Embarcadero Muni Metro/BART Station. Beyond the Embarcadero Station, the service changes to the T-Third line going towards King Street and serves the San Francisco Caltrain Station at 4th/King Street. The T-Third line goes along 3rd Street, generally parallel to I-280 and US 101, and terminates at the Bayshore Boulevard/Sunnydale Avenue stop.

BART

The Bay Area Rapid Transit system consists of 112 miles of heavy rail and 46 stations located throughout Alameda, Contra Costa, San Francisco, San Mateo, and soon Santa Clara County. Four of the downtown San Francisco locations are a combination of BART and MUNI Metro subway stations. BART currently has 669 revenue vehicles to provide service on weekdays and weekends. Between Market Street in San Francisco and SFO/Millbrae, BART generally runs parallel to US 101 and I-280. BART averaged 433,000 weekday trips in 2016, including nearly 70,000 trips through the Transbay Tube in each direction during peak commute hours. Embarcadero and Montgomery Stations are the busiest in the system, with 180,000 trips made to and from these stations each weekday in 2016. BART is currently the fifth busiest heavy rail rapid transit system in the United States.[30,31,32]

Extension to the Warm Springs District in Fremont was opened in 2017 and BART is working to extend the line further into the Silicon Valley with other BART line extension plans/projects. Work is underway to test the system for the Phase I extension to the Berryessa District in San Jose with a target date for passenger

[29] https://www.sfmta.com/about-sfmta/reports/performance-metrics/goal-3-environment-and-quality-life/estimated-economic

[30] http://www.bart.gov/about/history/facts

[31] https://www.bart.gov/sites/default/files/docs/BARTfactsheet_Apr17_0.pdf

[32] http://www.apta.com/resources/statistics/Documents/Ridership/2016-q4-ridership-APTA.pdf

service in June 2018. Phase II extension to downtown San Jose and Santa Clara is currently in the environmental phase with a target date for passenger service of 2026.

Along with the planned extensions listed above, BART has other key planned projects to enhance the system.[33] These enhancements include:

- New train cars
- Train control modernization
- New Hayward maintenance complex
- Station modernization program
- Investment in Transit Oriented Development
- Earthquake safety upgrade

Caltrain

Caltrain provides inter- and intra-county commuter rail service on the Peninsula, including 32 stations along a 77.2-mile alignment serving San Francisco, San Mateo, and Santa Clara Counties. The alignment in its entirety runs parallel to US 101. Caltrain operates 92 diesel locomotive-hauled trains per weekday between San Francisco and San Jose with limited service further south to Gilroy. This includes a mix of express/Baby Bullet (stops at six to eight stations), limited (with about 15 to 20 stops), and local (all-stop) trains. Caltrain's average weekday ridership has increased enormously since 2009. In FY 2014, the railroad carried an average of 59,916 riders each weekday, representing an increase of nearly 60 percent since FY2009 when the railroad carried 37,989 riders each average weekday.[34]

As a result of increased ridership, Caltrain is working on enhancing and improving the system through the following projects and plans:

- The Peninsula Corridor Electrification Project (PCEP) – provide significant enhancements by transitioning to electric trains. Work has begun in spot locations on this project, with electric trains anticipated to be in service in 2022.[35]
- The Caltrain Downtown Extension (DTX) – extend Caltrain 1.3 miles from Fourth and King Streets to the new Transbay Terminal at First and Mission Streets in San Francisco. The DTX was originally scheduled for completion in 2019; however, work is on hold due to a significant funding gap. The environmental phase of the project is continuing while work is being done to both identify funding sources and solidify the proposed alignment of the extension.[36] Funding for this project is also included in a proposal for a third regional transportation measure.
- Caltrain's Capital Program includes multiple projects in regards to bridge and grade crossing separation and replacement, signal optimization, station enhancement and improvement, and system maintenance.[37]
- Caltrain's Strategic Plan FY 2015-2024 provides guidance for the evolution of Caltrain to be ready for future increased service due to the PCEP. The plan identifies seven focus areas: safety, service,

[33] http://www.bart.gov/about/projects
[34] http://www.caltrain.com/Assets/_Planning/Strategic+Plan/Strategic+Plan+FY2015+-+FY2024/Caltrain+Short+Range+Transit+Plan+-+FY2015-FY2024+-+Final.pdf
[35] Caltrain Corridor Electrification
[36] http://www.sfcta.org/transbay-transit-center
[37] http://www.caltrain.com/projectsplans/Projects/Caltrain_Capital_Program.html

infrastructure and rolling stock, finance, transportation and land use, partners and stakeholders, and social responsibility.[38]

Ferry Service

The Water Emergency Transportation Agency (WETA) is a regional public transit agency tasked with operating and expanding ferry service on the San Francisco Bay and with coordinating the water transit response to regional emergencies. Under the brand name San Francisco Bay Ferry, WETA carries over two million passengers annually utilizing a fleet of twelve high speed passenger-only ferry vessels. San Francisco Bay Ferry currently serves the cities of Alameda, Oakland, San Francisco, South San Francisco, and Vallejo.[39]

WETA currently has three terminals generally within the vicinity of the US 101 South Corridor: AT&T Park, San Francisco Ferry Building and South San Francisco terminals. Although not a near-term project, a proposed Redwood City ferry service was identified in the Implementation and Operations Plan to provide service between Redwood City and Downtown San Francisco. The Redwood City project is currently funded through the conceptual design and environmental review phases only.

Amtrak/Capitol Corridor

The Capitol Corridor, which began service in 1991, is a 168-mile intercity passenger train route that connects San Jose to Oakland and Sacramento. 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. 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 Jose. 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. 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.[40]

California High-Speed Rail

The California High-Speed Rail Authority is responsible for planning, designing, building and operating the first high-speed rail system in the nation. California high-speed rail will connect the mega-regions of the State, contribute to economic development and a cleaner environment, create jobs and preserve agricultural and protected lands. Construction on Phase 1 of the project began in Fresno in early 2015. Since then, construction has been underway on the first leg of the phase, a 119-mile segment of track extending from the Central Valley to San Jose, expected to be completed by 2025. The second leg will extend from San Jose to San Francisco's Transbay Terminal, and from Bakersfield (through Los Angeles Union Station) to Anaheim in Southern California, with passenger service expected to begin in 2029.

[38] http://www.caltrain.com/Assets/Caltrain+Modernization+Program/Documents/Strategic+Plan+Final+Doc.pdf
[39] http://sanfranciscobayferry.com/weta
[40] Caltrans *Interregional Transportation Strategic Plan* (ITSP), June 2015.

Phase 2 will connect Los Angeles Union Station to San Diego and Merced to Sacramento. Both the second leg of Phase 1 and the entire Phase 2 are currently in the environmental and planning stages.[41]

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 goal. Due to the ineligibility of P&R projects for ITIP funds and the low priority given to P&R for State Highway Operations and Protection Program (SHOPP) funds, there is little funding available 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 US 101 South Corridor

Throughout the San Francisco Bay Area, there are 150 public P&R facilities available to commuters. Caltrans has fifty P&R facilities with a capacity of 5,606 parking spaces. Along the US 101 South Corridor, there are ten P&R facilities owned and maintained by Caltrans, totaling 2240 parking spots. More information about the current P&R inventory can be seen below in Table 13.

Table 13 *Caltrans Owned Park and Ride Facilities*

Lot Name	County	Route	Location	Parking Spaces
Whipple	SM	101	West of US 101 at Veterans/Whipple	52
101/92	SM	101	Under Route US 101/SR 92 Interchange	174
3rd Avenue	SM	101	Northeast Quadrant of US 101 and 3rd Avenue	13
Mountain View	SC	101	Central Expressway and SR 87 Interchange	338
California Avenue	SC	101	Alma Street and Oregon Expressway	159
San Antonio	SC	101	Alma Street and San Antonio Rd.	199
Sunnyvale	SC	101	W. Evelyn Avenue and N. Mathilda Ave.	477
Santa Clara	SC	101	SR 82 and Railroad Avenue	321
Lawrence	SC	101	Lawrence Expressway and San Zeno Way	122
Palo Alto	SC	101	SR 82 and Alma Street	385
Total				*2240*

In addition, there are five major multimodal transit stations within the Corridor in Santa Clara County that provide P&R lots as well as bicycle parking facilities:[42]

- Palo Alto Transit Center (two Rapid/Express Bus lines, seven local bus lines, four local shuttle lines, one regional commuter rail)
- Mountain View Transit Center (one light rail line, three local bus lines)

[41] http://www.hsr.ca.gov/

[42] VTA Bus-Rail Map (http://www.vta.org/getting-around/maps/bus-rail-map, January 2016)

- Santa Clara Transit Center (one Rapid Bus line, five local bus lines, three commuter rail lines)
- San Jose Diridon Transit Center (four Express Bus lines, four local bus lines, three commuter rail lines)
- Gilroy Transit Center (six Express/Regional bus lines, five local bus lines, one commuter rail line)

Table 14 *Other US 101 Park and Ride Facilities*

Lot Name	County	Route	Location	Parking Spaces
Capitol	SC	101	Capitol Expy. and SR 82 Interchange	378
Blossom Hill	SC	101	Blossom Hill Rd. and SR 82	425
San Martin	SC	101	San Martin Ave. and Monterey Rd.	167
Gilroy	SC	101	Monterey Rd. and W. 8th St	471
Morgan Hill	SC	101	Butterfield Blvd. and E. Main Ave.	486
Total				*1927*

Planned P&R Facilities in US 101 South Corridor

Caltrans has included new P&R projects in the Ten-Year SHOPP Plan that are within the US 101 South Corridor. The planned P&R projects are listed in Table 15.

Table 15 *Planned Park and Ride Facilities*

County	Route	Post Mile	Location	New Parking Spaces
San Francisco	101	3.9	US 101/16th Street	116
San Mateo	101	11.9	US 101/SR 92	90
San Mateo	92	R12.4	Eastern side of Norfolk Street under SR 92	82
San Mateo	92	R12.4	Western side of Norfolk Street under SR 92	128
Total				*416*

4.3 Private Commuter Shuttle Services

As job growth in the US 101 South Corridor has outpaced housing growth in recent years, the spatial mismatch between housing and jobs has increased. Private Commuter Shuttles (Shuttle), which have been in operation since 2004, are the private sector's response to this issue in the San Francisco Bay Area.[43] A Shuttle operator essentially provides a direct, one-seat 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, then provide a shuttle to those areas, and transport employees to and from work each day. That means that the origins and the routes of Shuttle trips can change with the location of the employees' residences. The Shuttle services are typically operated under a number of models such as 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.

[43] *Policy Analysis Memo to County of San Francisco Board of Supervisors*, March 2014.

In November 2015, the SFMTA Board approved a one-year Commuter Shuttle Program to become effective on April 1, 2016. The program included regulations on where the loading zones should be located and where large shuttles should operate. It also stipulated shuttle service providers phase-in cleaner vehicles over time and provide real-time GPS tracking information, among others. Staff from SFCTA and SFMTA conducted the *Commuter Shuttle Hub Study*[44] (2016) that explored an alternative reduced-stop hub-based approach. The analysis revealed several tradeoffs between hub scenarios and the existing program. While a hub-model might result in less shuttle vehicle travel on the city's surface streets, the study predicted this model would lead to a 24 - 45 percent drop in shuttle ridership, with nearly all of those riders switching to driving. The SFMTA Board used the findings from this study along with findings from a six-month review of the Commuter Shuttle Program to reauthorize the program in February 2017. The SFMTA continues to monitor the sector through its permanent shuttle coordinator.

Table 16 *Origins and Destinations of Private Commuter Shuttles by County*

Origin County	Destination County	Round Trips
San Francisco	Santa Clara	**308**
San Francisco	San Francisco	**18**
San Francisco	Marin	2
Alameda	Santa Clara	119
Alameda	Alameda	19
Alameda	San Mateo	11
San Mateo	San Mateo	**77**
San Mateo	San Francisco	**65**
San Mateo	Santa Clara	**44**
San Mateo	Solano	4
Santa Clara	Santa Clara	**81**
Marin	Santa Clara	6
Marin	San Mateo	3
Contra Costa	San Mateo	9
Contra Costa	Contra Costa	2
Contra Costa	Santa Clara	2
Contra Costa	Alameda	1
Contra Costa	San Francisco	1
Sacramento	Santa Clara	1
Santa Cruz	Santa Clara	31
Total Round Trips:		**804**

Source: MTC Bay Area Shuttle Census via Mercury News, September 2016

The Shuttle services have seen a lot of recent growth due to significant growth in employment in the Bay Area. In 2016, the combined 16 Shuttle providers that operate in San Francisco transported about 9,800 daily riders, up from 8,500 riders two years earlier.[45] MTC also conducted a regional Shuttle census in 2016. Table 16 lists the daily round trips of the 35 companies that participated. If the 35 companies were

[44] *Commuter Shuttle Hub Study*, 2016, SFMTA & SFCTA.

[45] *Commuter Shuttle Program: April – September 2016 Status* Report, October 2016 https://www.sfmta.com/sites/default/files/projects/2016/Commuter%20Shuttle%20Program%20Mid%20Term%20Status%20Report.pdf

a single transit agency, their combined annual total passenger counts would rank them the seventh largest transit agency in the Bay Area.[46]

4.4 Bicycle and Pedestrian Facilities

Policy Overview: District and Countywide Plans

In addition to the State and regional policies on Complete Streets, each county along the US 101 South Corridor has adopted their own bicycle or pedestrian and bicycle plan, outlining the policy goals as well as identifying pedestrian and bicycle needs within the county.

Caltrans District 4 Bike Plan

The Caltrans District 4 Bicycle Plan (D4BP), to be completed by Spring 2018, will identify and prioritize investments to improve bicycling on and across the State-owned transportation network. 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. Recommended projects from the Draft D4BP are still subject to change.

Santa Clara Countywide Bicycle Plan

The vision for the Santa Clara Countywide Bicycle Plan[47] 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. The current bicycle plan is in the process of being updated and anticipated to be adopted in Summer 2018 by VTA Board of Directors.

San Mateo County Comprehensive Bicycle and Pedestrian Plan

The 2011 San Mateo County Comprehensive Bicycle and Pedestrian Plan (CBPP)[48] provides a list of policy goals, and policies to achieve those goals. The goals include a comprehensive countywide system of facilities for bicyclists and pedestrians, more people riding and walking for transportation and recreation, improved safety for bicyclists and pedestrians, Complete Streets and routine accommodation of bicyclists and pedestrians, and strong local support for non-motorized transportation. By analyzing pedestrian demand based on land use, proximity to transit, employment and residential densities, and other factors, the CBPP concludes that pedestrian activity is most concentrated along the US 101 Corridor.

San Francisco Bicycle Plan

The San Francisco Bicycle Plan (2009)[49] recognizes bicycling as a critical component to improving the future health and prosperity of the City and helping achieve numerous policy goals, including reducing greenhouse gas emissions, conserving energy, improving the health and physical fitness of residents, mitigating the negative effects of traffic congestion, improving air quality, providing affordable transportation alternatives and creating more livable neighborhoods. The City aims to make bicycling a

[46] http://mtc.ca.gov/sites/default/files/2016%20Bay%20Area%20Shuttle%20Census.pdf, MTC Memorandum re: Bay Area Shuttle Census, September 2016

[47] http://www.vta.org/sfc/servlet.shepherd/version/download/068A0000001FZYt

[48] http://ccag.ca.gov/wp-content/uploads/2014/07/CBPP_Main-Report__Sept2011_FINAL.pdf

[49] https://www.sfmta.com/projects-planning/projects/2009-san-francisco-bicycle-plan

more viable mobility option and identifies action items that will ensure a major increase in the number of people that use bicycles safely as transportation.

Pedestrian and Bicycle Facility Needs and Projects

The pedestrian and bicycle facility needs assessment was developed utilizing a variety of sources, including:

- A high-level geo-photographic survey (via Google Maps) conducted by Caltrans District 4 Planning
- Approved Countywide pedestrian and bicycle plans,
- Stakeholder and public input for the *Caltrans District 4 Bicycle Plan* (D4BP) development efforts, and the associated project proposal lists from the three counties along the US 101 South Corridor.

Existing Conditions

A high-level geo-photographic survey was conducted via Google Maps to determine the existing conditions of the pedestrian and bicycle facilities along the US 101 South Corridor. Due to time and resource constraints, this CCP only focuses on freeway crossings for bicycles and pedestrians within the Corridor. An inventory of intersections, interchanges, and over- and under-crossings along US 101 and I-280 within the Corridor limits was created and included in Appendix B. A total of 116 crossings have been identified. In addition to the physical description of the active transportation facilities, the inventory incorporates nearby transit facilities and the posted speed limits of each vehicle crossing. Crossings at interchange locations are highlighted as they are often an obstacle in the active transportation networks due to conflicts with vehicular traffic, and because freeways act as a barrier to walking and bicycling, and there are often few opportunities to cross freeways. See Figures 9 and 10 for bicycle facilities within the US 101 South Corridor.

Needs Assessment and Project List

In addition to the bicycle projects identified in each County's most current pedestrian and bicycle plan and the updated project list from each CMA as part of the D4BP development, District 4 staff conducted additional analysis to identify bicycle needs along the Corridor. The analysis complements the needs assessment from the D4BP and takes into consideration the existing conditions of the bicycle facilities within the Corridor as discussed earlier. Improvements from existing plans and project lists were supplemented by additional locations that require improvement based on the analysis.

For pedestrian facilities, the projects list is mainly based on the current countywide pedestrian and bicycle plans as well as data from the existing conditions inventory where challenges to pedestrian travel have been identified.

The combined pedestrian and bicycle project list is included in Table 56 under Recommended Strategies. Caltrans has endorsed pedestrian and bicycle oriented design in various guidelines and standards such as Design Information Bulletin (DIB) 84[50], the Highway Design Manual[51], the Complete Intersections: A Guide to Reconstructing Intersections and Interchanges for Bicyclists and Pedestrians (2010)[52], and National Association of City Transportation Officials (NACTO) Urban Bikeway Design and Urban Street Design

[50] http://www.dot.ca.gov/design/stp/dib/dib84-01.html
[51] http://www.dot.ca.gov/design/manuals/hdm.html
[52] https://nacto.org/docs/usdg/complete_intersections_caltrans.pdf

Guides.[53] In general, the following strategies should be implemented to ensure the safety of bicyclists and pedestrians and provide connections for multi-modal travel.[54, 55]

- 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 5 feet and 4 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

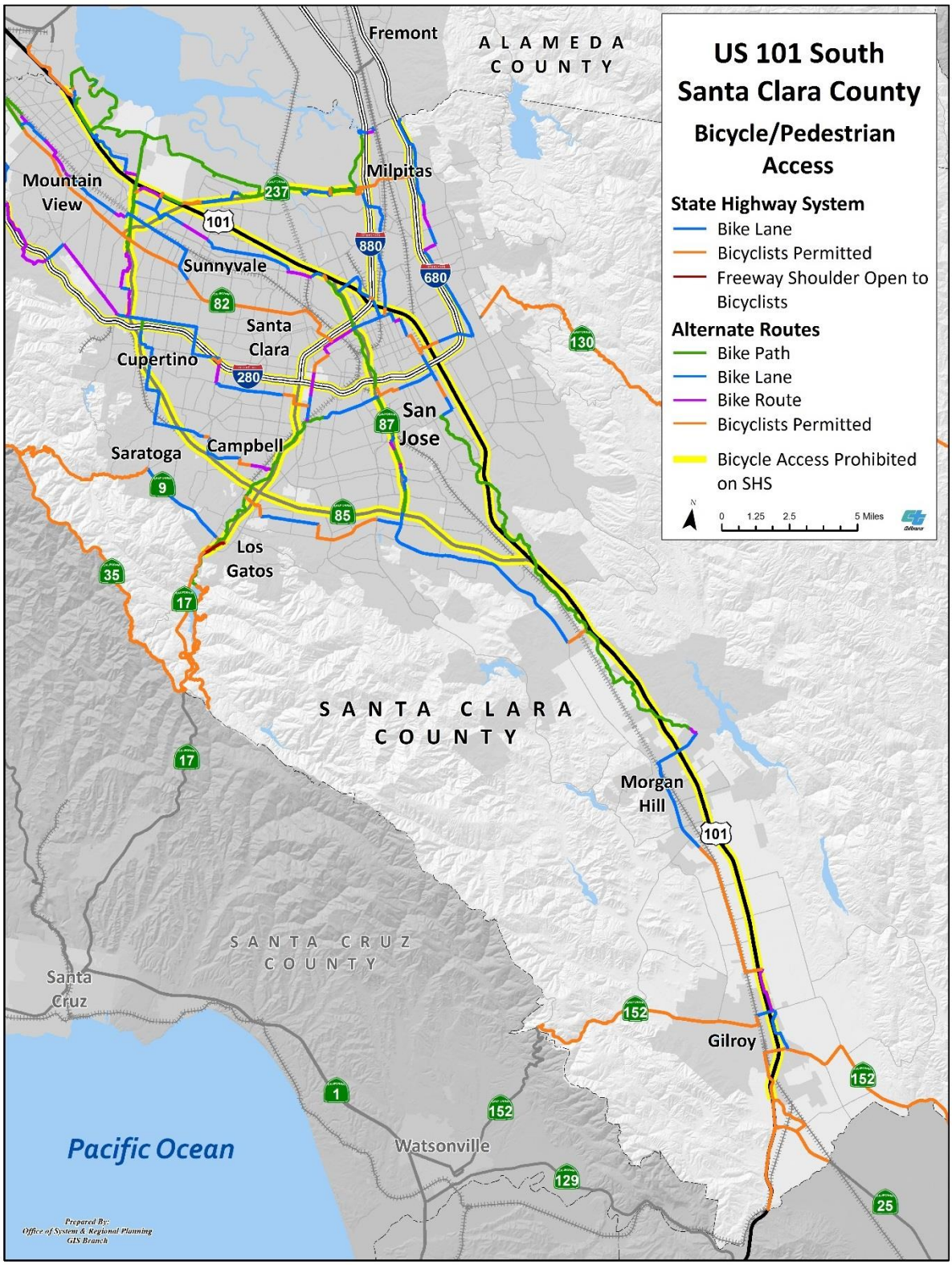
- Bicycle-Specific Strategies:
  - Provide context sensitive bicycle facilities on all roads crossing 101, including those through interchanges. Ensure the quality of the bicycle facility is maintained or improved through the interchange.
  - Provide a bicycle pocket or bike lane to the left of dedicated 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

[53] https://nacto.org/2014/04/11/california-officially-endorses-nacto-urban-street-design-guide-and-urban-bikeway-design-guide/

[54] https://altaplanning.com/wp-content/uploads/Complete-Intersections-A-Guide-to-Reconstructing-Intersections-and-Interchanges-for-Bicyclists-and-Pedestrians.pdf

[55] http://www.divergingdiamond.com/

Figure 9 *Bicycle Facilities in 2017 in Santa Clara County*



Source: Caltrans, District 4, GIS and Technical Support Branch, 2017

Figure 10 *Bicycle Facilities in 2017 in San Mateo and San Francisco Counties*

Source: Caltrans, District 4, GIS and Technical Support Branch, 2017

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.

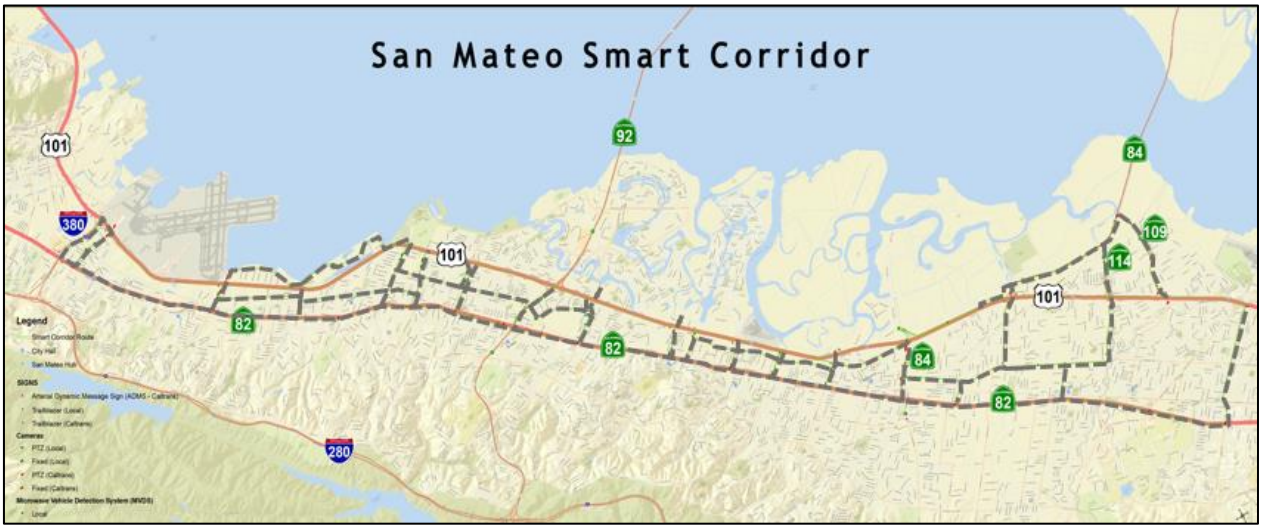
As TSMO strategies are developed and implemented, additional ITS/TOS elements within the corridor are often required. Caltrans Strategic Management Plan 2015–2020 has as Strategic Objective to "effectively manage transportation assets by implementing the asset management plan and embracing a fix-it-first 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.

Smart Corridor Project

An example of the TSMO strategies within the US 101 South Corridor is the interagency Smart Corridor Project that was launched in 2007. The project limits are US 101 (and parallel facilities SR 82, SR 84, SR 114, and SR 109) between the Santa Clara/San Mateo County line and I-380, as shown in Figure 11. There are currently two projects under development to extend the Smart Corridor Project limits to include SR 1, SR 35, SR 82 and additional local arterials in northern San Mateo County. The project objectives include monitoring real time traffic conditions and adjusting signal timing remotely, enabling shared control and operation, improving traffic flow and mobility, optimizing vehicle throughput, reducing traffic delays, and improving travel time reliability. Project stakeholders include local cities, law enforcement, and Caltrans. ITS/TOS elements implemented for the Smart Corridor Project include:

- Directional signs and arterial changeable message signs
- Center-to-center communications between San Mateo County Hub and Caltrans District 4 Traffic Management Center
- Communications (conduit, fiber, copper, wireless, software, and associated equipment)
- Fixed or pan-tilt-zoom CCTV cameras
- Power supply lines and equipment
- Vehicle detection systems

Figure 11 *Smart Corridor Limits*



Source: Caltrans, District 4, Traffic Operations, 2017

Ramp Metering

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 Draft 2017 RMDP, District 4 has 734 existing and/or programmed ramp meters and 561 planned ramp meter projects as of October 2017. Figure 12 on the next page shows operational, non-operational, partially constructed, and planned ramp metering locations along the US 101 South Corridor.

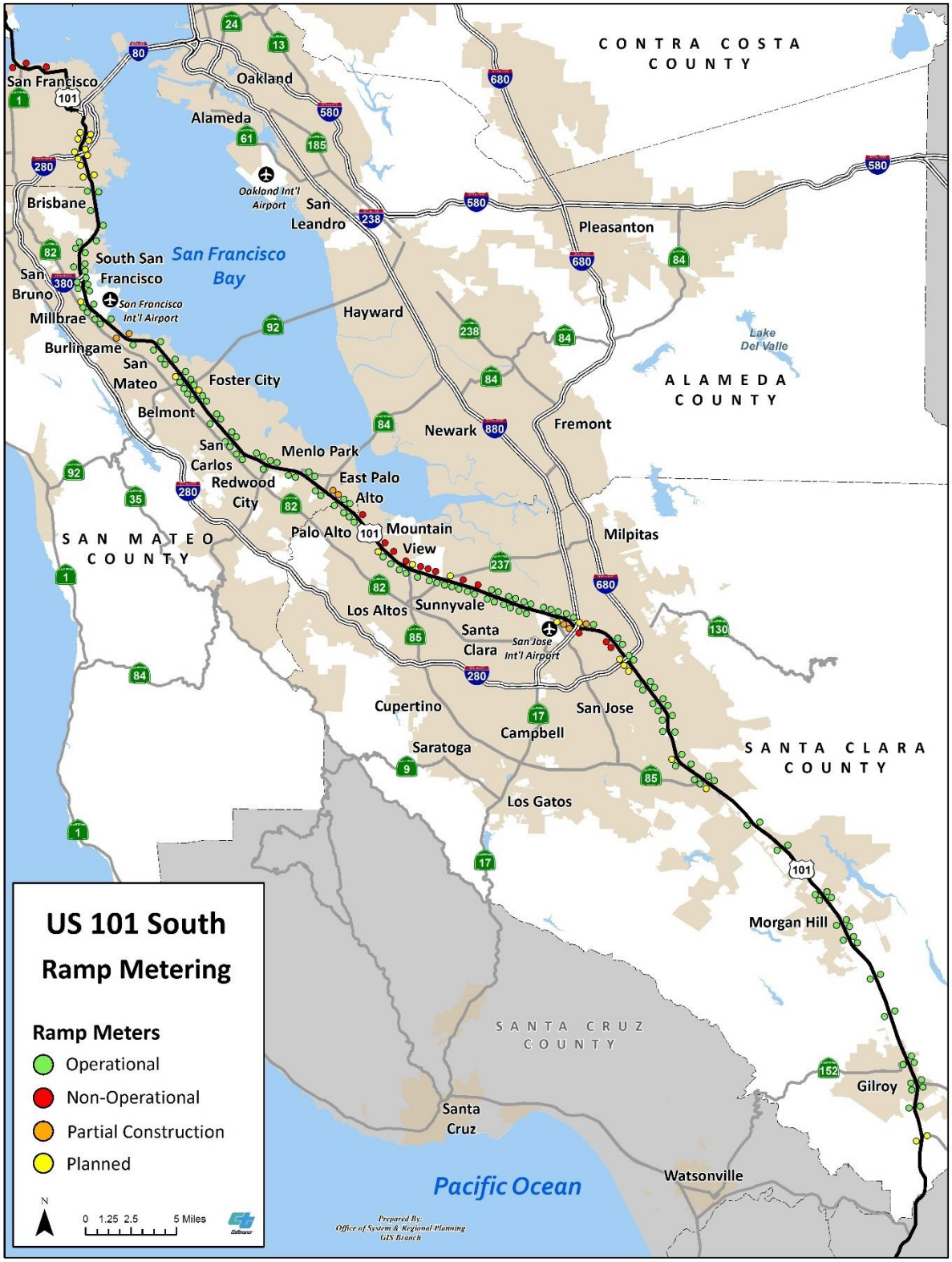
Other ITS/TOS Elements

Table 17 below summarizes other ITS/TOS elements in addition to ramp metering within the Corridor. They include: CCTV, CMS, Extinguishable Message Signs (EMS), Informational Message Signs (IMS), Variable Message Signs (VMS), HAR, and Traffic Monitoring Stations (TMS).

Table 17 *Other ITS/TOS Elements*

TOS Element	Direction	Seg 1 & 2 (SCL 101, 52.5 miles)	Seg 3, 4 &5 (SM 101, 26.1 miles)	Seg 6 (SF 101, 4.5 miles)	Seg 7 (SF 280, 3.2 miles)
CCTVs	NB	44	34	6	6
	SB	28	35	7	4
CMS/EMS	NB	5/5	3/2	5/2	-
	SB	6/5	5/4	2/2	-
IMS/VMS	NB	-	8/2	-	-
	SB	-	3/1	-	-
HAR	-	5	4	*1*	
TMS	NB	68	23	1	-
	Both	50	63	13	1
	SB	65	23	-	-

Figure 12 *Ramp Metering Locations*



Source: Caltrans, District 4, GIS and Technical Support Branch, 2017

4.6 Transportation Demand Management

Transportation demand management (also known as traffic demand management or travel demand management, all TDM) is a broad application of projects and strategies aimed at reducing travel demand or shifting the demand to other modes, other routes, or other 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. Already mentioned in paragraphs 4.1 to 4.4 are shuttle services, bike parking, park-and-ride lots, paratransit services, and Complete Street designs on local streets.

TDM Examples

Local jurisdictions and transportation agencies in Santa Clara County have multiple TDM programs in place. One example is the Multi-Family Residential TDM Program in Sunnyvale that has incentives for reducing single occupancy trips, including help from onsite TDM coordinators. VTA is working on bus stop and shelter upgrades to support the Rapid Transit project on Stevens Creek Boulevard and San Carlos Street. Hotel TDM targets the hotel guests in Santa Clara County and may include pre-loaded Clipper Cards, information on reaching the hotel without using a car, and bicycle parking for guests and personnel.

A TDM example in San Mateo County is the local community and employer based commuter shuttle services. Most of these shuttle routes facilitate movement in and near the US 101 Corridor and provide access to adjacent Caltrain, BART, or Ferry stations. In addition, Commute.org, the countywide TDM agency for San Mateo County provides vanpool, carpool, and multimodal commute incentives and bicycle safety training in San Mateo County. A carpool incentive pilot program is also being implemented by the City/ County Association of Governments of San Mateo County.

San Francisco has identified a climate program in the regional transportation plan that includes TDM and Emission Reduction Technology. Projects in this category implement strategies and programs that reduce emissions, encourage alternative transportation modes, and manage transportation demand including but not limited to projects such as TDM program implementation, parking management, local area shuttle and paratransit services.

4.7 Freight Network, Facilities and Trip Generators

US 101 is identified on the federally-designated National Highway Freight Network (NHFN) as a 'Primary Highway Freight System (PHFS) route. The route is a major gateway between Silicon Valley and San Francisco, and serves as a primary access route to San Francisco International Airport, the Norman Y. Mineta San Jose International Airport and for intraregional goods movement. The route in its entirety is part of the STAA National Network and identified as a Tier 2 facility in the California Freight Mobility Plan (CFMP),

a route critical to freight movement with a medium freight network priority for project investments. I-280 is identified as a 'Non-PHFS Interstate' route in the NHFN, and as a Tier 3 facility. Tier 3 routes, while still critical to freight movement and needs investment, have the relatively lowest freight network priority.[1] 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 being a safer, more efficient and reliable, less polluting freight system. The December 2014 approved CFMP responds to these needs through various initiatives and contains an extensive set of projects, included in the draft version of the CFMP update that is currently underway.

US 101 is included in the 2016 San Francisco Bay Area Goods Movement Plan. The route is also part of the on-going study called Improving Goods Movement Efficiency and Competitiveness in the Northern California Mega-region 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, and US 101 is critical in connecting the Bay Area to the Central Valley (via SR 152) and San Benito and Monterey Counties.

Approximately three percent of total vehicular traffic can be attributed to trucks along most of US 101 in San Francisco, San Mateo, and Northern Santa Clara County. South of the US 101/SR 85 south interchange, truck traffic percentage is up to 8.5 percent, although the total traffic volumes are lower. Expected increases in air cargo would translate to an increase in truck volumes on US 101 coming into and out of the San Francisco International Airport and the Norman Y. Mineta San Jose International Airport.[2]

Major freight traffic generators within the Corridor include:

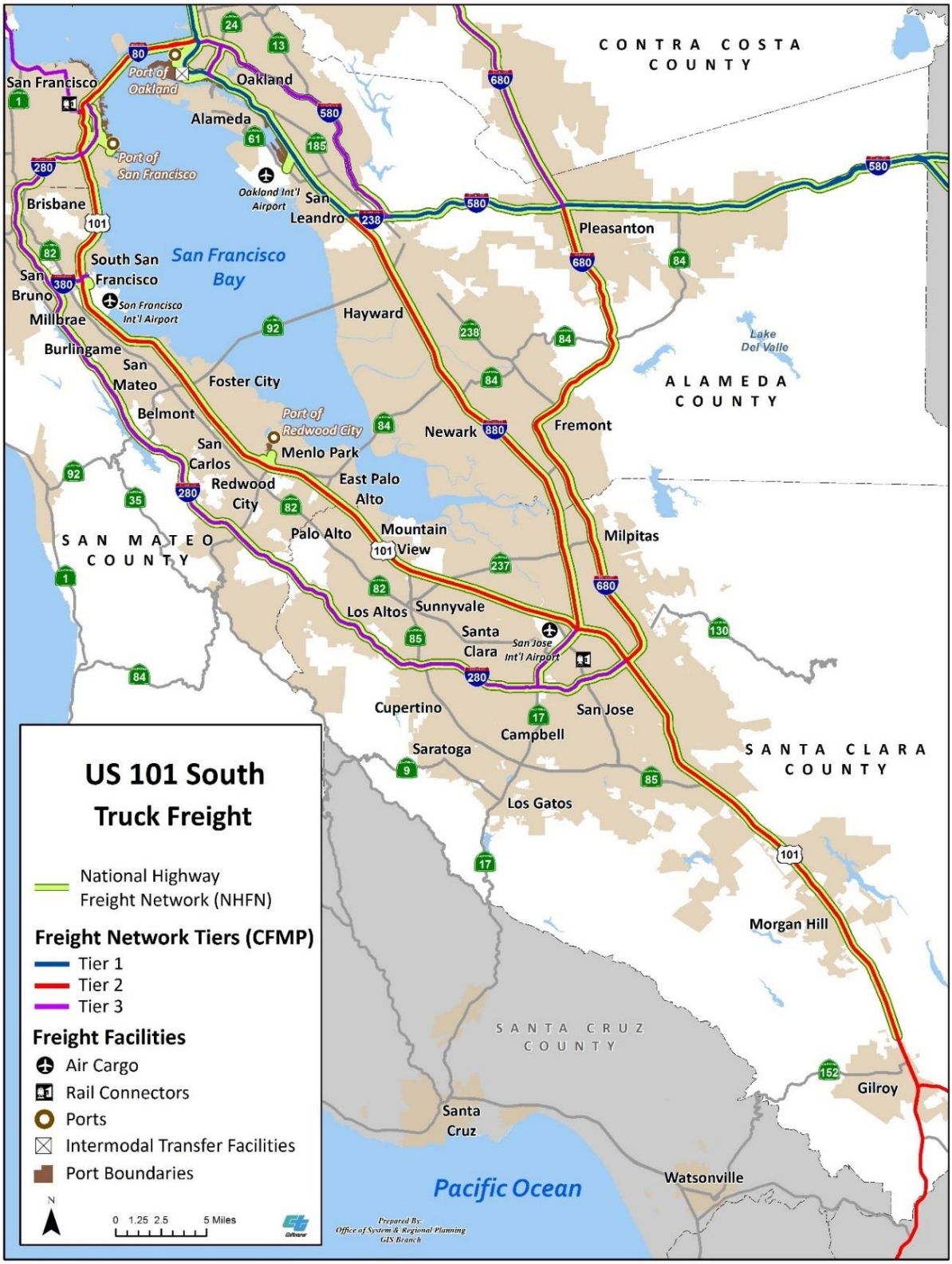
- San Francisco International Airport
- Norman Y. Mineta San Jose International Airport
- Port of San Francisco
- Port of Redwood City

The railways within the Corridor are Tier 2 facilities. United Pacific Railroads (UP) owns the railway tracks between San Benito/Santa Clara County line and Tamien Station in San Jose (and then crossing US 101 toward the East Bay). Caltrain operates a locally vital passenger rail service within the Corridor and owns the tracks between San Francisco and Tamien Station in San Jose. Caltrain allows freight trains to access its tracks. There are also short-lines railroads between the Ports of San Francisco and Redwood City and the other rail networks. A short-line railroad provides ~~a~~ freight rail services for bulk based and containerized freight to be transported from cargo ships to and from nearby intermodal hubs. See Figures 13 and 14 for freight facilities within the US 101 South Corridor.

[1] California Freight Mobility Plan, December 2014

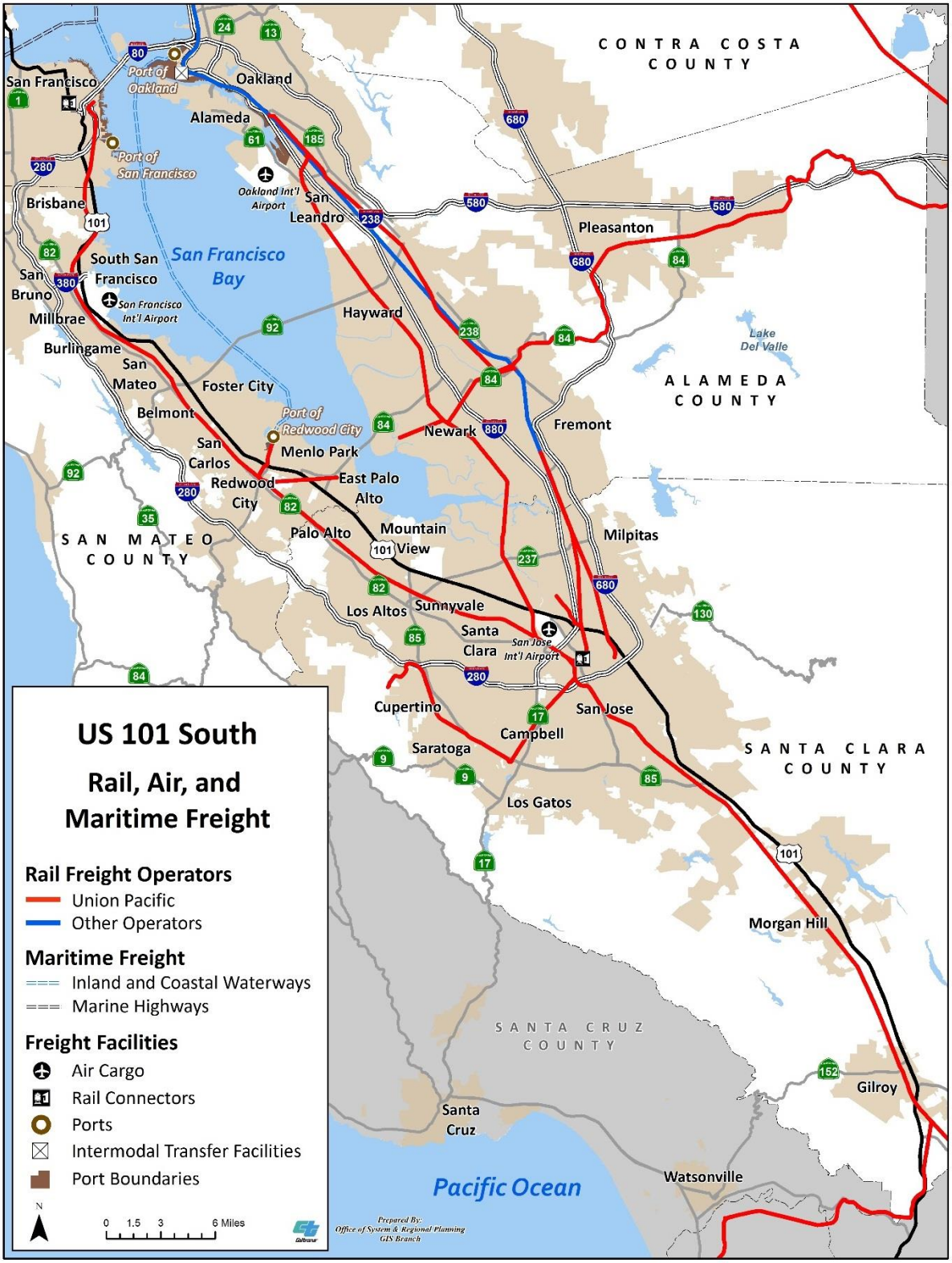
[2] http://www.dot.ca.gov/hq/tpp/offices/ogm/factsheets/aircargo/AirCargo_SanFrancisco_092616.pdf http://www.dot.ca.gov/hq/tpp/offices/ogm/factsheets/D4-Contact-Only-Update/pdfs/SanJose_Factsheet_070512_(contact_update_091316).pdf

Figure 13 *Trucking Facilities*



Source: Caltrans, District 4, GIS and Technical Support Branch, 2017

Figure 14 *Freight Rail Facilities*



Source: Caltrans, District 4, GIS and Technical Support Branch, 2017

Chapter 5: Freeway Performance

5.1 Existing Conditions

The existing conditions for the US 101 South Corridor were derived from the following reports:

- *The Project Report (August 2015) and the accompanying Final Traffic Operations Analysis Report (June 2014) for the US 101 Express Lanes Project in Santa Clara County*. The study limits are from the US 101/Tennant Avenue Interchange in Morgan Hill (SCL, US 101, PM 15.1) to the San Mateo County line just north of the Embarcadero Road interchange in Palo Alto (SCL, US 101, PM 52.6).
- *The Santa Clara County US 101 Ramp Metering Implementation Plan* (January 2017). The study limits are from the US 101/SR 25 Interchange (SCL, US 101, PM 3.2) to the US 101/SR 85 Interchange in San José (SCL, US 101, PM R26.8).
- *The Draft Final Traffic Operations Analysis Report for the US 101 Managed Lanes Project in San Mateo County (August 2017).* The study limits are from Rengstorff Avenue, Mountain View in Santa Clara County (SCL, US 101, PM 50.6) to East Grand Avenue, South San Francisco in San Mateo County (SM, US 101, PM 21.8).
- *Draft Final Report for the San Francisco Freeway Corridor Management Study Phase 2 (2017),* prepared by the San Francisco County Transportation Authority. The study limits are US 101 from the US 101/I-380 interchange in San Bruno (SM, US 101, PM 20.7) to the US 101/I-80 interchange (SF, US 101, PM 4.2), and I-280 within San Francisco (SF, I-280, PM 0.0-7.5).
- *2016 Congestion Management Program Monitoring and Conformance Report*, Santa Clara County.

Where data was not available in the reference sources listed above, Caltrans Traffic Census, INRIX and Traffic Accident Surveillance and Analysis System-Transportation Systems Network (TASAS-TSN) was used to fill-in the gaps to provide a general assessment of freeway the performance and to complement existing project reports and studies.

Santa Clara County

This section documents the existing condition of Segments 1 and 2 of the US 101 South Corridor from San Benito/Santa Clara County line to Santa Clara/San Mateo County line just north of Oregon Expressway/Embarcadero Road.

Tennant Avenue to San Mateo County Line

US 101 within the study limits of the Project Report is a full access-controlled freeway consisting typically of three general purpose (GP) lanes and one HOV lane in each direction. Auxiliary lanes are found in various locations along US 101 to facilitate merging and weaving operations between interchanges. There are currently no HOV lanes between Tennant Avenue and Cochrane Road in Morgan Hill, while two HOV lanes exist between the US 101/SR 85 North Interchange in Mountain View and just north of Loma Verde Avenue in Palo Alto (PM SCL 51.10).

Figure 15 *INRIX March 2011 Speed Contours US 101 from Cochrane Road to Oregon Expressway*

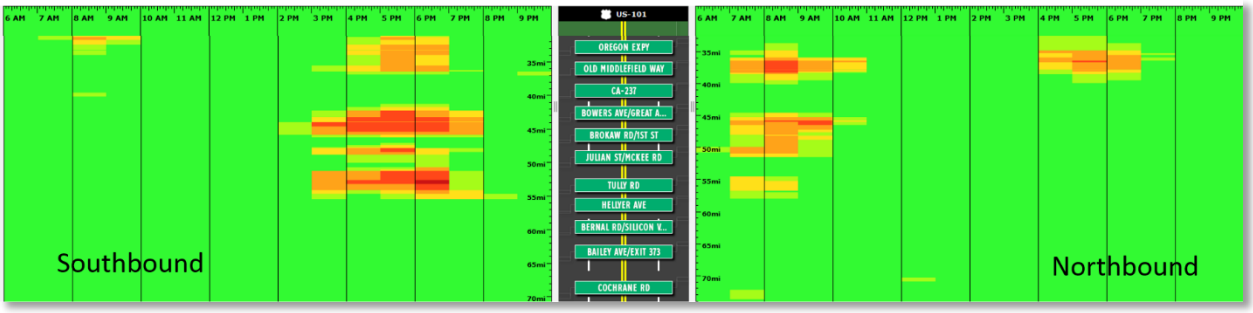
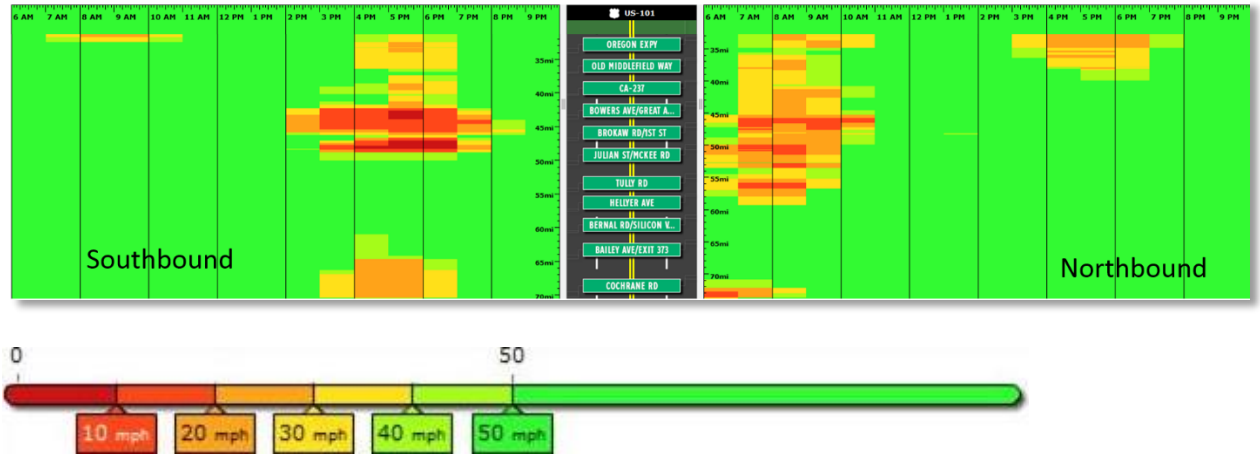


Figure 16 *INRIX March 2016 Speed Contours US 101 from Cochrane Road to Oregon Expressway*



From the Caltrans US 101 Project Report (August 2015, pp 49 – 55), the AM peak hour traffic demand in 2009 was 4,273 – 9,086 vehicles for the northbound (NB) with the greatest traffic demand occurring between Capitol Expressway Diagonal On and Tully Road Diagonal NB On. For the southbound (SB) direction AM peak hour traffic demand was 2,770 – 7,690 vehicles, with the greatest traffic demand occurring between north of Oregon Expressway/Embarcadero Road and Shoreline Boulevard/SR 85 off. The PM peak hour demand was 2,050 – 6,850 vehicles for NB with the greatest traffic demand occurring between San Antonio off and north of Oregon/Embarcadero. For the SB direction PM peak hour traffic demand was 2,770 – 8,150 with the greatest traffic demand occurring between Oakland off and I-280/680.

Truck percentages ranged from four to five percent towards the northern study limit to eight to nine percent towards the southern study limit. HOV accounted for eleven to 21 percent of the traffic volumes during peak periods (generally 6:00-9:00 AM for AM peak period and 3:00-6:00 PM for PM peak period). In 2011, US 101 within the study limits carried up to 245,000 vehicles per day including HOV traffic. According to Caltrans Traffic Census, the highest Average Annual Daily Traffic (AADT) in 2015 was 258,000, observed at the Tully Road Interchange.[56]

[56] http://www.dot.ca.gov/trafficops/census/

Figure 17 *US 101 Project Study Area Location and Study Limits*

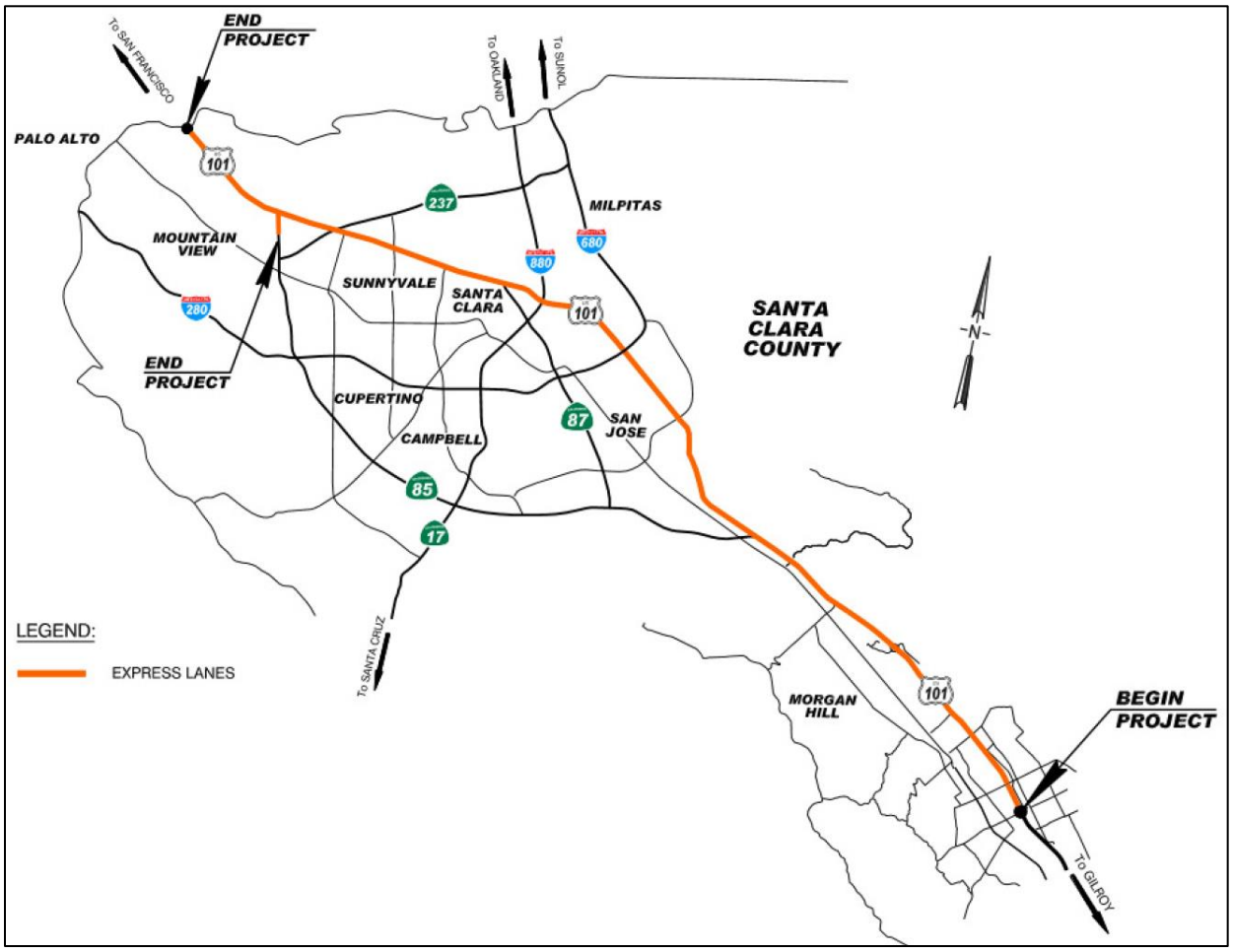


Table 18 *2015 AADT*

County	US 101 Post Miles	Location	2015 AADT Volumes
SCL	R16.006	EAST DUNNE AVENUE	132000
	R26.78	SAN JOSE, SR 85	138000
	30.097	HELLYER AVENUE	180000
	31.695	SAN JOSE, CAPITOL EXPRESSWAY	219000
	33.034	SAN JOSE, TULLY ROAD	258000
	34.87	SAN JOSE, I-280, I-680	200000
	38.3	SAN JOSE, I-880	147000
	39.925	SR 87, GUADALUPE PARKWAY	201000
	43.85	SUNNYVALE, LAWRENCE EXPRESSWAY	181000
	48.103	MOUNTAIN VIEW, SR 85	227000
	52.55	SANTA CLARA/SAN MATEO COUNTY LINE	222000

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

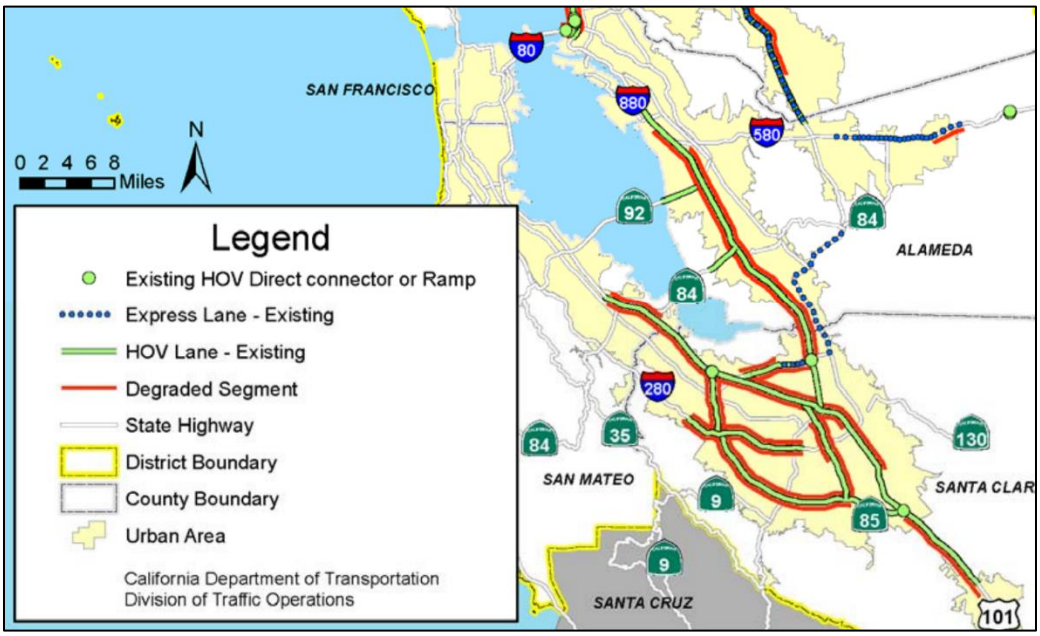
Freeway Congestion

MTC's Vital Signs report ranks southbound US 101 from Mountain View to Downtown San José as the third most congested segment in the Bay Area in 2016. Other congested areas in this section listed in the

Top 50 Congested Locations are in northbound direction from Blossom Hill Road/Silver Creek Valley Road in San José to North Fair Oaks Avenue in Sunnyvale (#11), and in northbound direction between San Martin Avenue in Gilroy and East Dunne Avenue in Morgan Hill (#49).

According to VTA's 2016 Monitoring and Conformance Report, nearly 20 miles of HOV lanes in the northbound direction during the AM peak period and nearly 11 miles in the southbound direction during the PM peak period were operating at or below Level of Service F (i.e. under 35 miles per hour). In Figure 18, degraded HOV lane segments are shown in red.

Figure 18 *Degraded HOV Lane Segments*



Source: Caltrans Managed Lane Degradation report

Table 19 shows observed general purpose (GP) lane bottlenecks within the Corridor and Table 20 shows the congestion locations in HOV lanes on the next page.

Table 19 *Bottlenecks*

Direction/Time	Location	Queue Length	End of the Queue
NB/AM	Tully Road loop on-ramp to Tully Road Diagonal on-ramp	3.6 miles	Hellyer Avenue
	McKee Road on-ramp to Old Oakland Road off-ramp	1.5 miles	Alum Rock Avenue
	Trimble Road on-ramp to Montague Expressway off-ramp	2.5 miles	Old Bayshore Highway
	Shoreline Boulevard on-ramp to NB Rengstorff Avenue off-ramp	1.5 miles	Moffett Boulevard
	Between Dunne diagonal on and Cochrane off*	5.1 miles	Masten Avenue
SB/AM	University Avenue on-ramp to Oregon Expressway off-ramp	5.0 miles	Woodside Road
	Oregon Expressway on-ramp to San Antonio Road off-ramp	0.5 miles	North of Embarcadero Road
NB/PM	San Antonio Road on-ramp to Oregon Expressway/Embarcadero Road off-ramp	3.8 miles	Ellis Street
	Oregon Expressway/Embarcadero Road on-ramp to University Avenue off-ramp	1.5 miles	Oregon Expressway/ Embarcadero Road
SB/PM	Oregon Expressway on-ramp to San Antonio Road off-ramp	4.0 miles	Between Marsh and Woodside Roads
	Rengstorff Avenue on-ramp to Old Middlefield Way on-ramp	1.0 miles	San Antonio Road
	De La Cruz Boulevard on-ramp and SR 87 off-ramp	3.6 miles	Lawrence Expressway
	Oakland Road on-ramp to McKee Road off-ramp	2.0 miles	Fourth Street
	I-280/I-680 on-ramp to Tully Road off-ramp	2.0 miles	Santa Clara Street
	Tully Road on-ramp to Capitol Expressway off-ramp	2.2 miles	Story Road
	US 101 at GP lane drop south of SR 85 I/C*	1.5 miles	SR 85 connector ramp
	HOV lane drop before Cochrane off-ramp*	2.5 miles	Bailey Avenue
	Tennant Avenue ramp*	2.0 miles	Cochrane (Bailey Avenue)

Source: Santa Clara County US 101 Project Report–4.3.1, pp. 29 – 30, and Santa Clara County US 101 Ramp Metering Implementation Plan, Table 4, p. 20, and Table 15, p. 39
* 2017 figures

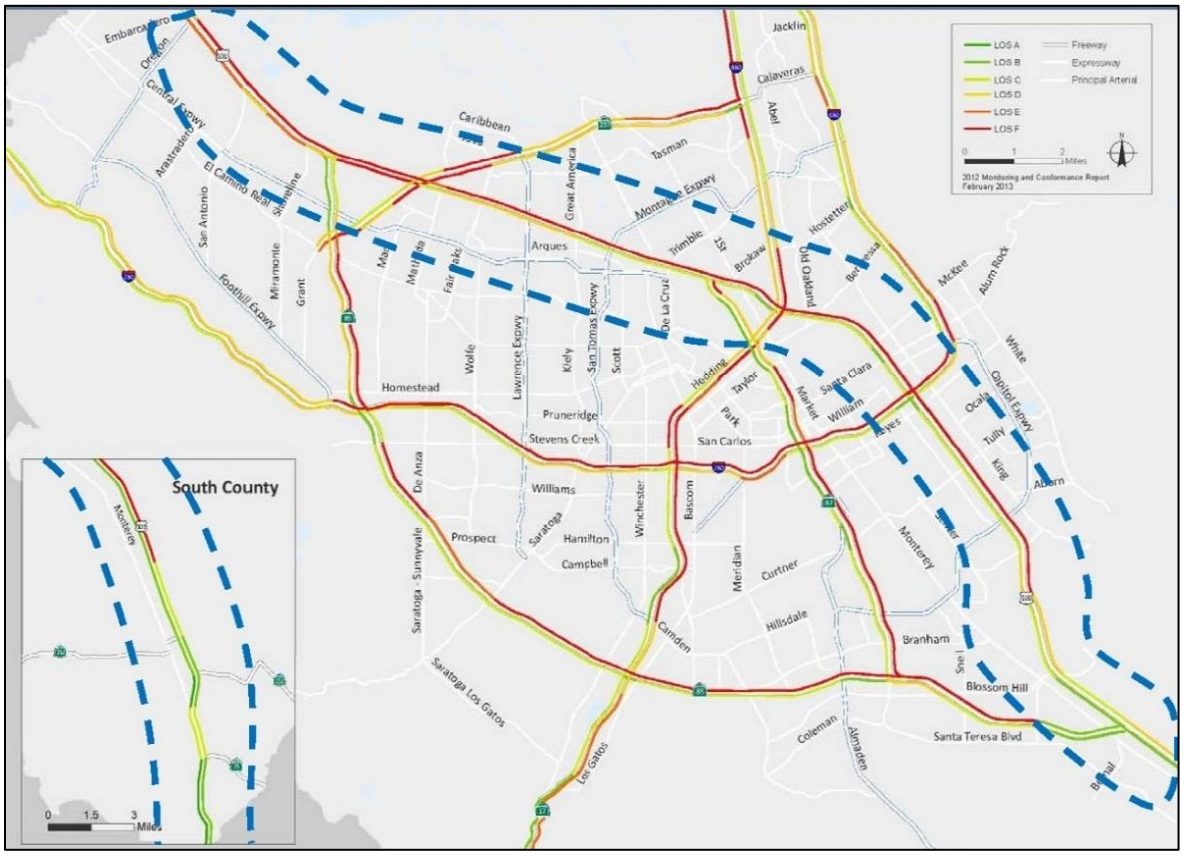
Table 20 *Congestion Locations in HOV Lanes*

Direction/Time	Location
NB/AM	Capitol Expressway off-ramp to Tully Road on-ramp
	I-680 on-ramp to Old Oakland Road off-ramp
	North 1st Street on-ramp to Trimble Road off-ramp
	SR 85 HOV connector to Rengstorff Avenue off-ramp
SB/AM	n/a
NB/PM	Ellis Street off-ramp to San Antonio on-ramp
	Between Oregon Expressway/Embarcadero off and on-ramps
SB/PM	Marsh Road on-ramp to Rengstorff Avenue on-ramp
	Great America Parkway off-ramp to De La Cruz Boulevard on-ramp
	North 4th Street on-ramp to Old Oakland Road on-ramp
	East Santa Clara Street on-ramp to Tully Road on-ramp

Source: Santa Clara County US 101 Project Report–4.3.1, pp. 29 – 30

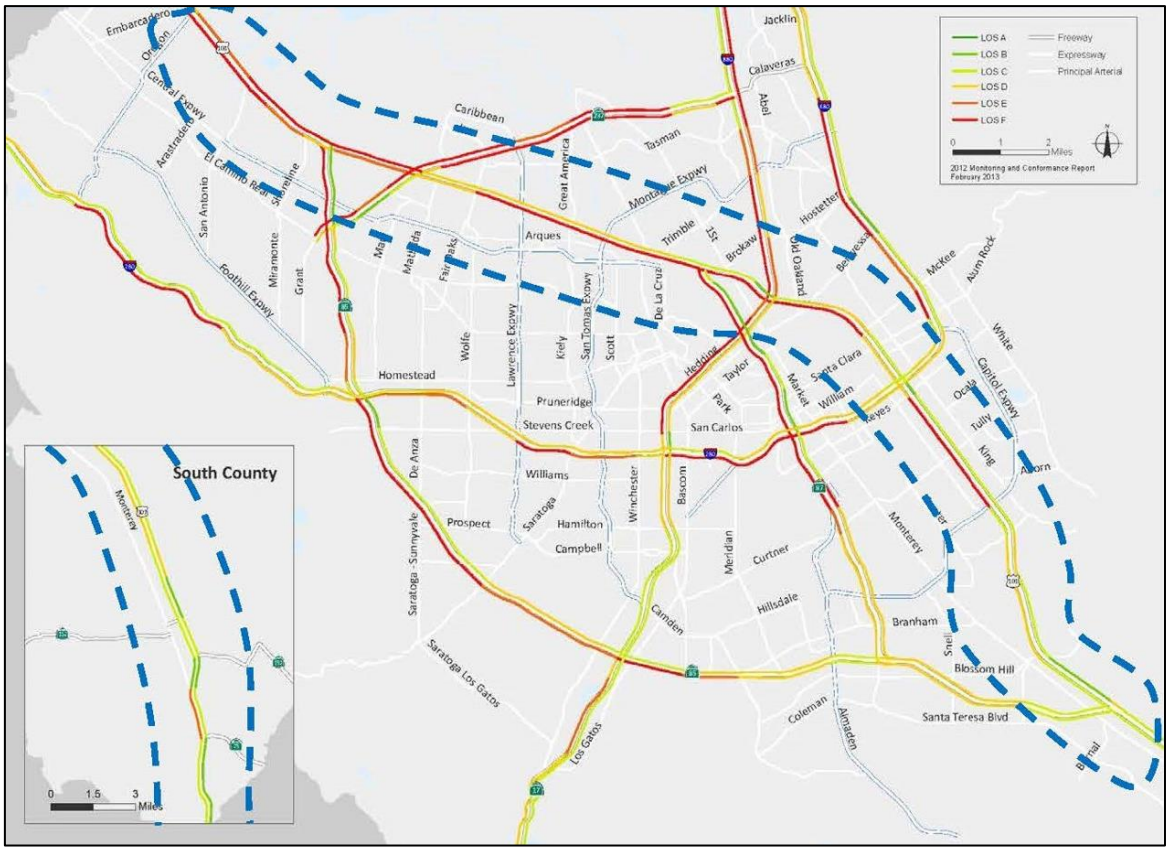
Figures 19 and 20 show the Level of Service (LOS), queue length and congested locations for the AM Peak Period and PM Peak Period respectively in the GP lanes. In general, traffic congestion in Santa Clara has steadily increased from 2012 to 2016 for segments operating at LOS E and F. This occurs to about 55% to 60% of all mixed flow traffic.

Figure 19 *Mixed Flow Level of Service and Location for AM Peak Period*



Source: VTA 2016 Monitoring and Conformance Report, Mixed-Flow Level of Service Analysis, P. 50

Figure 20 *Mixed Flow Level of Service and Location for PM Peak Period*



Source: VTA 2016 Monitoring and Conformance Report, Mixed-Flow Level of Service Analysis, p.51

The Level of Service, queue length and congested locations in the HOV lanes along the US 101 Corridor (not shown) indicate that congestion is occurring at a high level, particularly during the AM Peak Period. The number of lane miles operating at LOS E and F increased by nearly 10% between 2012 and 2016.

Travel Times

Table 21 shows travel times through the Corridor under existing conditions. General purpose lanes experienced major delays in NB direction during AM peak hour and in both directions during PM peak hour, while HOV lanes offered significant time savings compared to the GP lanes.

Table 21 *Peak Hour Travel Times in Minutes*

Direction/Time	Lane Type	Segment Group	Free Flow	Existing
NB AM	GP	Dunne Avenue on-ramp to Embarcadero Road on-ramp	*33.4*	*45.5*
	HOV	Cochrane NB on-ramp to Embarcadero Road on-ramp	31.7	32.9
SB AM	GP	Oregon Expwy/Embarcadero on-ramp to Dunne Avenue off-ramp	32.9	34.8
	HOV	San Antonio off-ramp to end of HOV lane	29.3	27.4
NB PM	GP	Dunne Avenue on-ramp to Embarcadero Road on-ramp	33.4	47.5
	HOV	Cochrane NB on-ramp to Embarcadero Road on-ramp	31.7	32.7
SB PM	GP	Oregon Expwy/Embarcadero on-ramp to Dunne Avenue off-ramp	32.9	54.1
	HOV	San Antonio off-ramp to end of HOV lane	29.3	32.8

Source: Santa Clara County US 101 Project Report–Table 5.2.16-3, pp. 93-94

Safety

Accident data for US 101 within the study limits was provided by TASAS-TSN for the three-year period from August 1, 2012 through July 31, 2015. Table 22 summarizes the accident data.

Table 22 *Three-Year Accident Analysis for US 101 Mainline from August 1, 2012 to July 31, 2015*

Location	Post Miles	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 US 101	15.10 – R26.78 R26.78 – 48.10 48.10 – 52.55	4,478	0.30 to 0.90	0.002 to 0.005	0.11 to 0.26	0.68 to 1.03	0.004	0.22 to 0.32

Source: Caltrans, TASAS-TSN report

* F = Fatal, I = Injury

<u>San Benito County Line to Tennant Avenue</u>

US 101 in Santa Clara County outside the study limits of the Project Report is a full access-controlled freeway north of Monterey Road (PM R4.95), consisting of three GP lanes in each direction. South of Monterey Road, the facility is an expressway with two GP lanes in each direction. No auxiliary lanes are found in this stretch of US 101. An MTC 2016 Vital Signs congested segment was identified during the SB PM Peak Period in this section of US 101 between Monterey Road and Castro Valley Road (#104).

Data from Caltrans Traffic Census and INRIX was used to further describe this section's performance, while the Santa Clara County US 101 Ramp Metering Implementation Plan (January 2017), with traffic data collected in 2015 and 2016, was used to highlight the specific performance of the freeway in light of ramp meter implementation. The Traffic Census shows that in 2011 the AADT between the San Benito County line and East Dunne Avenue ranged from 50,000 to 125,000 and in 2015 from 56,000 to 132,000. The INRIX speed contour maps, both directions shown in Figure 21, indicate there was no bottleneck in this section in 2011, but a NB AM bottleneck emerged at Dunne Avenue, and queues extend into this segment. There was also some minor slow down during the PM peak period in the SB direction near SR 25 in 2015, see Figure 22.

Figure 21 *INRIX March 2011 Speed Contours US 101 San Benito County Border to Bailey Avenue*

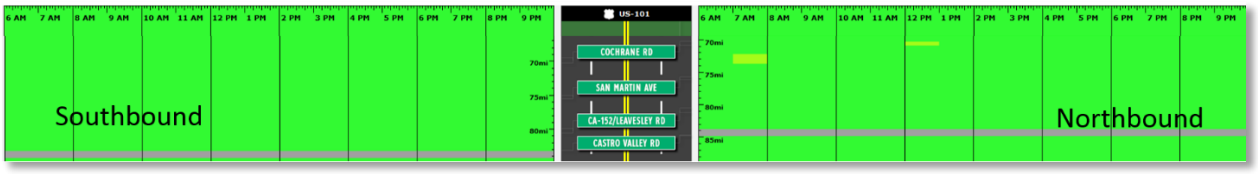


Figure 22 *INRIX March 2016 Speed Contours US 101 San Benito County Border to Bailey Avenue*

Table 23 *2015 AADT*

County	US 101 Post Miles	Location	2015 AADT Volumes
SCL	0.03	SAN BENITO/SANTA CLARA COUNTY LINE	56000
	3.16	SR 25	79000
	R7.53	GILROY, SR 152 WEST	105000
	R16.01	EAST DUNNE AVENUE	132000

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

Safety

Accident data for US 101 within the study limits was provided by Caltrans for the three-year period from August 1, 2012 through July 31, 2015. Table 24 summarizes the accident data.

Table 24 *Three-Year Accident Analysis for US 101 Mainline from August 1, 2012 to July 31, 2015*

Location	Post Miles	Number of Collisions Total	Actual Accident Rate per million vehicle miles			Average Accident Rate per million vehicle miles		
			Total	F	F + I*	Total	F	F + I
SCL US 101	0.00 – 15.10	571	0.39	0.005	0.14	0.76	0.007	0.27

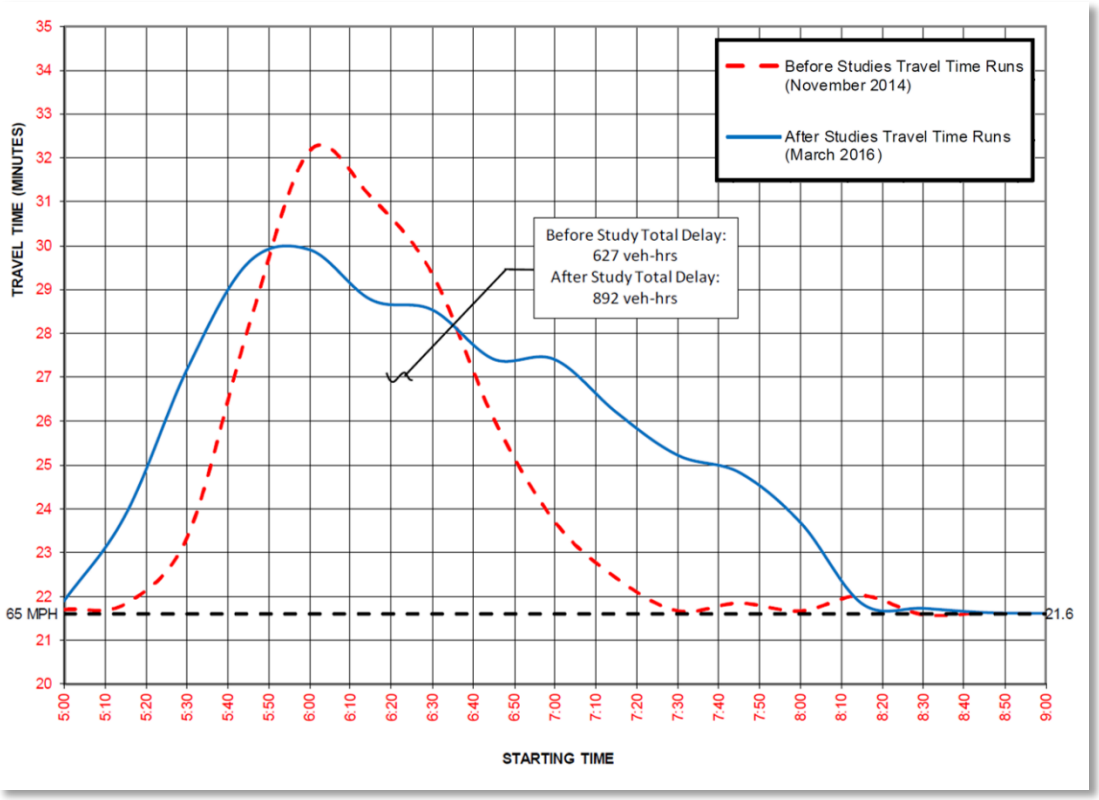
Source: Caltrans, TASAS-TSN report

* F = Fatal, I = Injury

Ramp Metering Implementation between SR 25 in Gilroy and SR 85 in San José

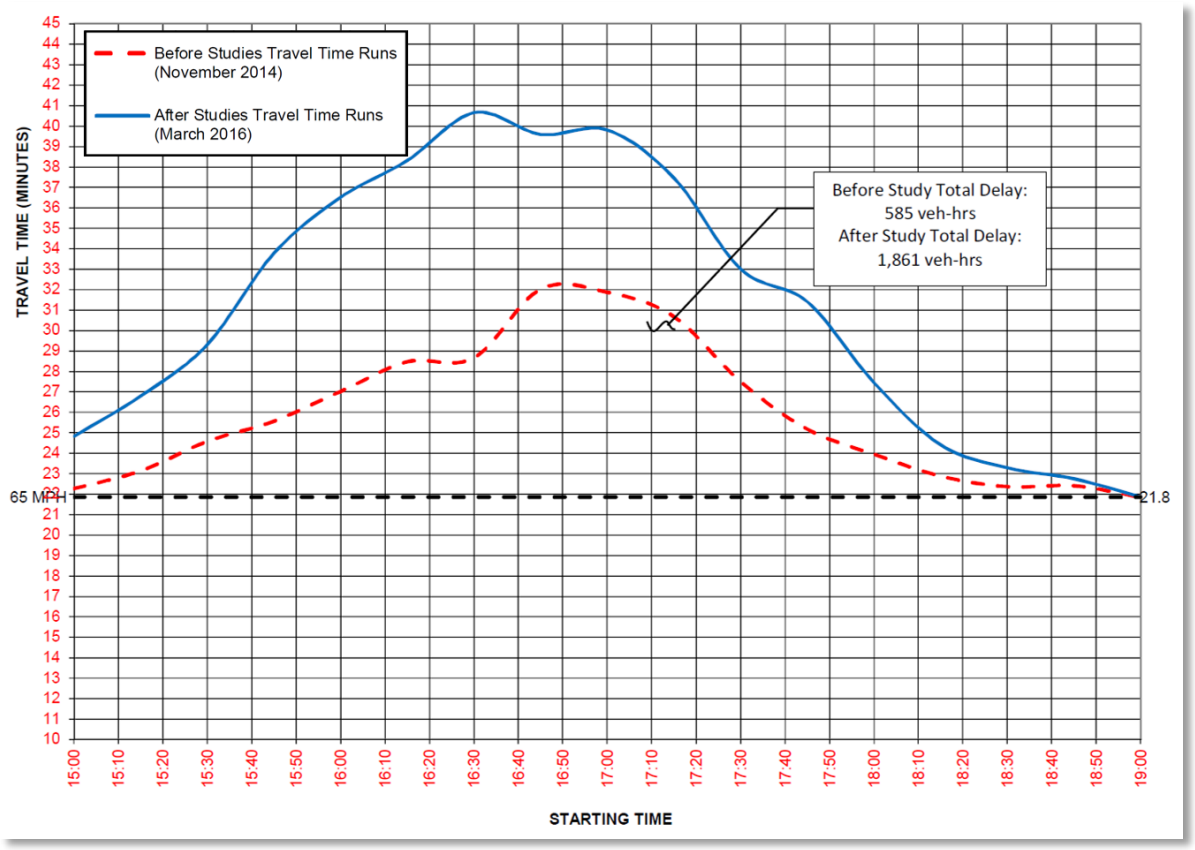
Ramp meters were implemented between SR 25 and SR 85 in October of 2015 as a management tool to improve the functioning of the freeway mainline. Driving uninterrupted at 65 miles per hour, it takes 21.6 minutes to drive northbound from SR 25 in Gilroy to Bernal Road in San José, as shown in Figure 23. During commute hours mainline congestion slows traffic down. Travel time runs carried out during November 2014 show a single peak of more than 32 minutes during commute hours compared to the runs taken after ramp metering was put in place. Within a two-month time frame of the 2015 implementation (data not shown in graph), the average travel time dropped from 25.5 minutes to 22.8 minutes. The 2016 figures show an overall increase in traffic congestion, though ramp metering helped to flatten the peak.

Figure 23 *NB US 101 (SR 25 in Gilroy to Bernal Road in San José)*



Source: Santa Clara County US 101 Ramp Metering Implementation, Figure E4, p. E8

Figure 24 *SB US 101 (SR 85 in San José to SR 25 in Gilroy)*



Source: Santa Clara County US 101 Ramp Metering Implementation, Figure E5, p. E12

Driving southbound from SR 85 in San José to SR 25 in Gilroy, it takes for the entire stretch 21.8 minutes at 65 miles per hour, as shown in Figure 24. Where the northbound AM commute peaked below 33 minutes, the southbound PM commute shows a wider setting also just below 33 minutes, indicating the evening commute was the busier commute of the two in 2014. The graph further indicates that traffic increased significantly between November 2014 and March 2016 and that the duration of the trip has become much longer. This complicates establishing the benefit of ramp meter implementation. However, within a two-month time frame of the 2015 implementation (data not shown in graph), the average travel time did improve slightly, from 23.7 minutes to 23.6 minutes.

Northbound, ramp metering continues to provide better driving times for traffic using US 101, while southbound traffic still benefits from ramp metering, yet the overall capacity is being reached.

A new bottleneck was observed in the southbound direction, south of the SR 85 connector where a general purpose lane drop occurs. This new bottleneck is attributed to increased traffic demands.

San Mateo County

This section documents the current conditions of the US 101 South Corridor in Segment 3 from the Santa Clara County line to Whipple Avenue in Redwood City and Segment 4 from Whipple Avenue to the US 101/I-380 interchange. Information presented in this section is mostly derived from the Traffic Operations Analysis Report (TOAR) for the US 101 Managed Lanes Project in San Mateo County. The study limits of the TOAR is from the US 101/Rengstorff Avenue interchange in Mountain View to the US 101 /East Grand Avenue in South San Francisco, north of I-380. It should be noted that there is an overlap (from Rengstorff Avenue to Santa Clara/San Mateo County line) between this TOAR and the study limits of the Santa Clara US 101 Express Lanes Project Report discussed earlier.

The study uses the 2013 C/CAG travel demand model, yet additional traffic counts were obtained to balance the model to reflect demand volumes experienced in 2015. HOV data was provided by the 2015 MTC HOV Occupancy Survey.

Between Oregon Expressway/Embarcadero Road in Santa Clara County and Whipple Avenue in San Mateo County, US 101 typically consists of one HOV lane and three general purpose lanes in each direction. The northbound HOV lane ends at the Whipple Avenue interchange while the southbound HOV lane begins just north of the Whipple Avenue overcrossing. From Whipple Avenue to the San Francisco County line, US 101 is typically an eight-lane freeway (four GP lanes in each direction). Auxiliary lanes are constructed between most interchanges.

Figure 25 *INRIX March 2011 Speed Contours US 101 from Willow Road to I-380*

Figure 26 *INRIX March 2016 Speed Contours US 101 from Willow Road to I-380*

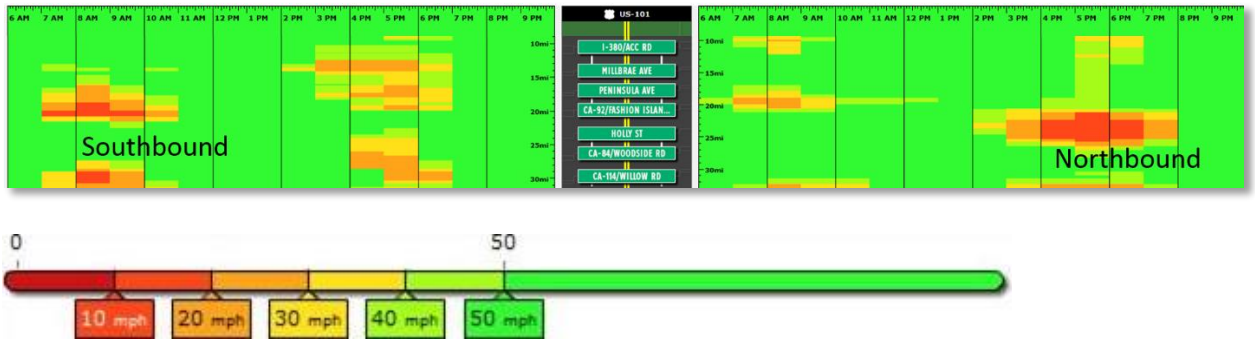
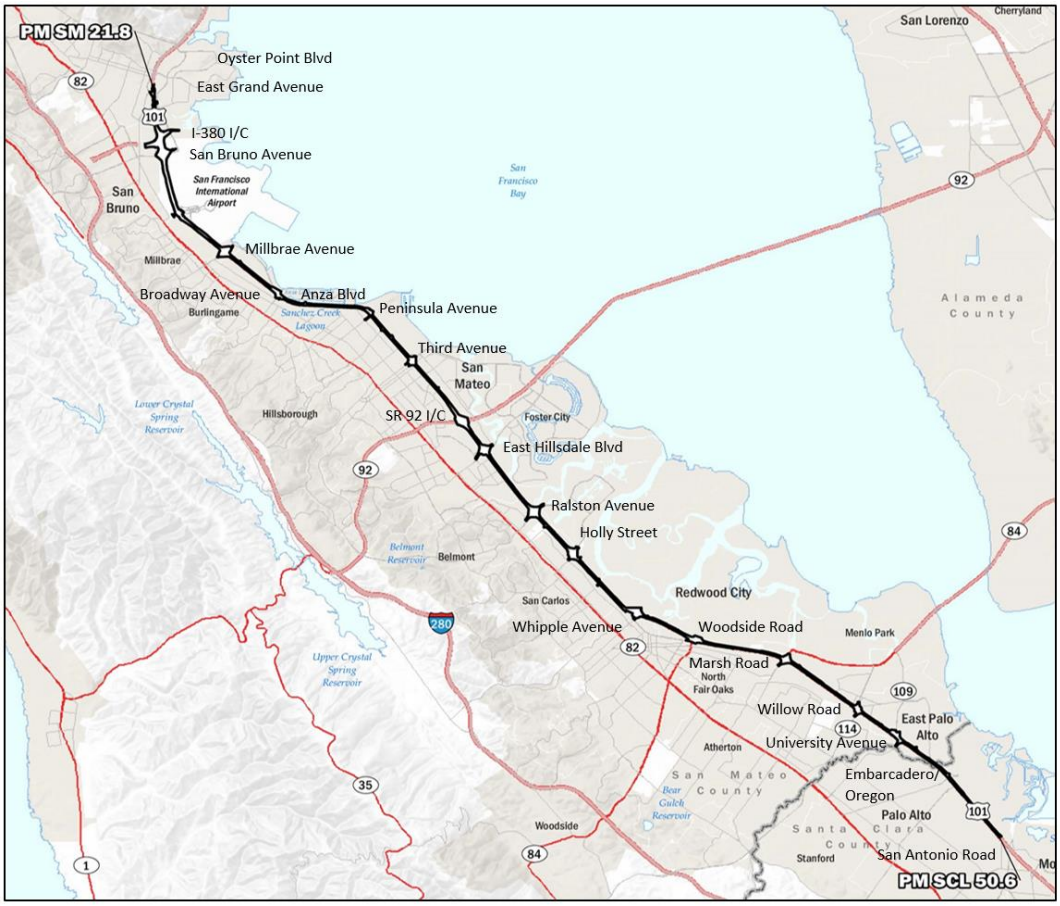


Figure 27 *US 101 Project Study Area Location and Study Limits*



Freeway Congestion

MTC's Vital Signs report has three areas in this section listed in the Top 50 Congested Locations of the Bay Area in 2016. The congested areas occur in the northbound direction from Whipple Avenue to East Hillsdale Boulevard (#12), from south of Broadway to East Hillsdale Boulevard (#25), and in the southbound direction between University Avenue and SR 84 (#38).

Traffic Volumes

The traffic volumes dataset was derived from several sources listed below.

- Caltrans Traffic Census database (2009-2015)
- Caltrans Performance Measurement System (PeMS)
- 2014 Caltrans Annual Average Daily Truck Traffic Database
- 2015 MTC HOV Occupancy Survey, and
- Project-specific traffic volume counts conducted in 2015

HOV lane usage information for the study area was derived from MTC HOV Occupancy Data. The HOV percentage represents the relative proportion of vehicles using the HOV lanes over the vehicles using all lanes. In the Year 2005, the California Vehicle Code (CVC) began allowing qualified single occupancy low-emission vehicles to legally use HOV lanes (CVC 5205.5 and 21655.9). Based on the 2009 Caltrans HOV

Lane Report, those vehicles accounted for up to 10 percent of the HOV lane traffic on certain segments of US 101.

During the AM peak period, HOV volumes on US 101 accounted for 22 to 30 percent of the total volume in the northbound direction and 18 percent in the southbound direction. During the PM peak period, HOV volumes accounted for 20 to 27 percent of the total volume in the northbound direction and 25 to 33 percent in the southbound direction.

According to Caltrans Annual Average Daily Truck Traffic Database, truck traffic accounted for three to five percent of the total traffic volume in this section of US 101 in 2014.

Bottlenecks

Table 25 summarizes the existing bottlenecks in the general purpose lanes as identified in the TOAR for the San Mateo US 101 Express Lanes Project and their respective queue lengths. HOV lanes (not shown) also experienced congestion due to operational degradation of the GP lanes (with HOV vehicles slowing down, unable to move in and out of HOV lane).

Table 25 *2015 Bottlenecks*

Direction/ Time	Location	Queue Length	End of the Queue
NB/AM	off-ramp/diagonal off-ramp	1.0+ miles	Extends beyond the study area
	Oregon Expressway/Embarcadero Road to University	1.3 miles	Merges with Rengstorff bottleneck
	3rd Avenue off-ramp and the 3rd Avenue on-ramp	3.9 miles	Ralston Avenue I/C
SB/AM	Westbound and eastbound Hillsdale Boulevard onramps	3.2 miles	Near Poplar Avenue I/C
	- Secondary bottleneck observed SR 92 EB on-ramp and Hillsdale off-ramp		
	University Avenue to Oregon Expressway/ Embarcadero Road	1.3 miles	Near Woodside Road off-ramp
	- Secondary bottleneck observed at Willow Road ramps		
NB/PM	Oregon Expressway/Embarcadero Road to University	1.3+ miles	Extends beyond the study area
	Hillsdale Boulevard on-ramp to SR 92 off-ramp	0.75 miles	Near Woodside Road I/C
SB/PM	Millbrae Avenue ramps	2.6 miles	Near San Bruno Avenue
	Poplar Avenue ramps	2.4 miles	Near Broadway off-ramp
	Third and Fourth Avenue to SR 92/Fashion Island off-ramp	1.6 miles	Overlaps Poplar Avenue bottleneck
	Woodside Road to Marsh Road off-ramp	3.0 miles	Whipple Avenue I/C
	Rengstorff Avenue on-ramp merge	6.5 miles	Overlaps with Marsh Road bottleneck

Source: US 101 Managed Lanes Report–3.4, pp. 26 – 28

Travel Times

Table 26 shows the travel times for general purpose lane and HOV lane users during both peak periods in both directions. While HOV lanes only exist between San Antonio Road and Whipple Avenues, they still offered a time saving compared to the general purpose lane during the most congested periods of the day.

Table 26 *US 101 Travel Times*

Direction	Limits	Peak Period	Travel Time in Minutes	
			GP Lane	HOV Lane
NB	San Antonio Road to I-380 (22.65 miles)	6:00-10:00 AM	22-39	22-34
		3:00-7:00 PM	27-42	26-35
SB	I-380 to San Antonio Road (23.10 miles)	6:00-10:00 AM	21-53	21-33
		3:00-7:00 PM	27-71	25-50

Source: US 101 Managed Lanes Report–5.2, Tables 3-16 to 3-19, p. 38

Safety

Accident data for US 101 within the study limits provided by Caltrans for the three-year period from August 1, 2012 through July 31, 2015. Table 27 summarizes the accident data.

Table 27 *Three-Year Accident Analysis for US 101 Mainline from August 1, 2012 to July 31, 2015*

Location	Post Miles	Number of Collisions Total	Actual Accident Rate per million vehicle miles			Average Accident Rate per million vehicle miles		
			Total	F	F + I*	Total	F	F + I
SM US 101	0.00 – 6.62 6.62 – R20.72 R20.72 – 26.11	3,548	0.35 to 0.74	0.001 to 0.002	0.14 to 0.23	0.95 to 1.01	0.004	0.29 to 0.31

Source: Caltrans, TASAS-TSN report

* F = Fatal, I = Injury

San Francisco County and Northern San Mateo County

This section documents the current conditions for Segments 5, 6 and 7 of the US 101 South Corridor. Segments 5 and 6 are US 101 from the US 101/I-380 interchange in San Mateo County to I-80, continuing onto the Central Freeway section in San Francisco. Segment 7 is I-280 from the US 101/I-280 interchange to the end of the freeway, including both the 5th Street/King Street and 6th Street/Brannan Street ramps.

The information in this section is mostly derived from the Freeway Corridor Management Study (FCMS) Phase 2 Draft Final Report (January 2017). As part of the study, speed and travel time data to assess congestion was obtained from INRIX and PeMS. The main focus of the FCMS report is to recommend a set of Managed Lanes (HOV/Express lanes) and complementary system management strategies for the US 101 and I-280 corridors in San Francisco that will help San Francisco achieve its economic competitiveness, environmental, social and equity goals while maximizing person throughput, through a performance-

based analysis and stakeholder consultation. There is an overlap (from I-380 to Grand Avenue) between this FCMS Draft Final Report and the study limits of the TOAR for the San Mateo US 101 Express Lanes Project discussed earlier. It should be noted that the FCMS Final Report is still being finalized as of the writing of the Draft CCP. As a result, information presented in this section is subject to change.

Within the study limits, US 101 is primarily an eight-lane freeway in San Mateo County and a six to ten-lane freeway in San Francisco. US 101 is a six-lane freeway through the I-280 interchange that widens up to eight lanes until the I-80 interchange, where the roadway continues as I-80 as a six-lane facility. The Central Freeway ending at Market Street in San Francisco is a four-lane facility.

For the purpose of this CCP, I-280 is primarily a standard six-lane facility with auxiliary lanes north of the US 101/I-280 interchange.

Figure 28 *INRIX March 2011 Speed Contours* ***US 101*** *from I-380 to Beacon Street*

Figure 29 *INRIX March 2016 Speed Contours* ***US 101*** *from I-380 to Beacon Street*

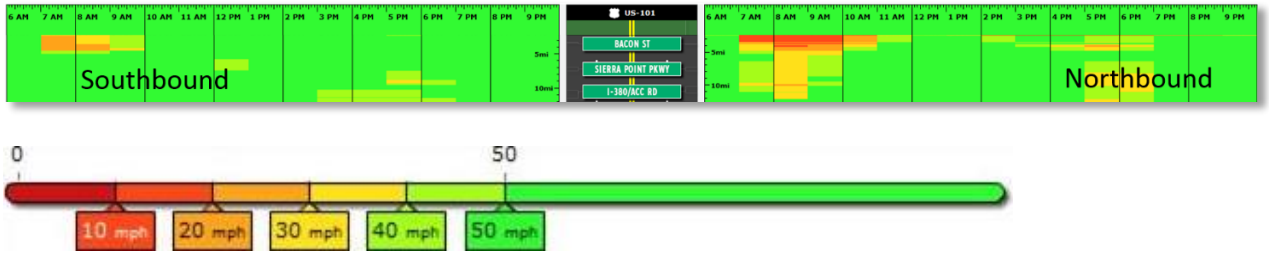


Figure 30 *INRIX March 2011 Speed Contours* ***I-280*** *from Monterey Boulevard to Fifth Street*

Figure 31 *INRIX March 2016 Speed Contours* ***I-280*** *from Monterey Boulevard to Fifth Street*

Traffic Demand

In 2015, during the AM peak hour, estimated traffic demand on US 101 ranged from 4,971 to 9,017 in the northbound direction and 6,632 to 8,347 in the southbound direction; estimated demand on I-280 ranged from 2,106 to 6,328 in the northbound direction and 983 to 3,178 in the southbound direction. During the PM peak hour, estimated traffic demand on US 101 ranged from 3,834 to 8,151 in the northbound

direction and 5,864 to 8,930 in the southbound direction; estimated demand on I-280 ranged from 3,085 to 5,867 in the northbound direction and 1,330 to 5,512 in the southbound direction.

Vehicle Occupancy Rate

To determine existing vehicle occupancy rates, manual peak period counts were conducted at ramps on I-280 in San Francisco. Weekday peak period volume and occupancy data for mainline US 101 were obtained from the Bay Area Managed Lane Implementation Plan project, which was collected between March and mid-May of 2015. No mid-day or off-peak vehicle occupancy data was available or collected. Based on the occupancy data gathered, vehicles with two or more persons represent about 13 to 22 percent of all vehicles on US 101 mainline and 18 to 26 percent on I-280 in the study area. Increasing the HOV definition to three or more persons per vehicle would reduce the percentage of HOV-eligible vehicles to around three percent on US 101 mainline and seven to nine percent on I-280. Eligible users of high occupancy vehicle lanes include buses, vanpools, clean air vehicles, and motorcycles. The data also shows that on US 101, truck traffic represented about four to six percent of the total traffic volume during the AM peak period and one to three percent during the PM peak period; at I-280 ramps, trucks traffic generally accounted for less than five percent of the total traffic volume, but the on-ramp from Cesar Chavez Street carried a significant higher percentage of trucks at 15 percent.

Table 28 *Vehicle Occupancy and Truck Percentage*

Route	Time/Direction	2+ HOV %	3+ HOV %	Truck %
US 101	AM NB	17-18%	2-3%	5-6%
	AM SB	13%	2-3%	4-5%
	PM NB	20%	3%	1-3%
	PM SB	22%	3%	3%
I-280	AM NB	18%	7%	3%
	AM SB	25%	7%	2-15%
	PM NB	20%	9%	1%
	PM SB	26%	7%	1-4%

Source: SM/SF-101 and SF-280 Managed Lane Feasibility Study, p. 10

Freeway Congestion

MTC's Vital Signs report ranks northbound US 101 to I-80 San Francisco-Oakland Bay Bridge as the most congested corridor in 2016. The area from Third Street to Cesar Chavez Street in the northbound direction on US 101 is also listed in the Top 50 Congested Locations of the Bay Area (#32).

Bottlenecks

This section of US 101 is one of the most congested freeways in the region, with the segment in San Francisco from the US 101/I-280 interchange to I-80 and the Bay Bridge ranked as the fourth most congested freeway section in MTC's 2015 Vital Signs report. Some of the bottlenecks are outside of the CCP study limits, but need to be considered as they affect traffic conditions within the Corridor. Table 29 lists the bottlenecks under the existing conditions.

Table 29 *Bottlenecks*

	Location	Length	End of Queue
NB/AM			
US 101	Grand Avenue off	1.2 mile	Sierra Point Parkway off
	Sierra Point Parkway on	3.1 miles	Third Street off
	Bayshore Boulevard on	0.7 miles	Vermont Street off
I-280	San Jose Avenue off	2.9 miles	Cesar Chavez off
	Off-ramps at 6th Street/Brannan Street and 5th Street/King Street	0.8 miles	Mariposa I/C
NB/PM			
I-80	Lower Deck Bay Bridge (outside Corridor limits)	7.2 miles	US 101/I-280 I/C
US 101	Airport Boulevard on	2.3 miles	Sierra Point Parkway off
	Sierra Point Parkway on	3.1 miles	Third Street off
I-280	Off-ramps 6th/Brannan Street and 5th/King Street	0.5 miles	6th Street off-ramp gore point
SB/AM			
US 101	Alemany Boulevard on	2.1 miles	Alana Way
	Hospital Curve	- -	- -
I-280	N/A (6th/Brannan and 5th/King Street intersections constraining flow)	- -	- -
SB/PM			
US 101	Hospital Curve (from outside Corridor limits)	7.2 miles	Upper Deck Bay Bridge
	Bayshore Boulevard	- -	- -
I-280	US 101 South on	1.7 miles	Monterey Boulevard off

Source: SM/SF-101 and SF-280 Managed Lane Feasibility Study, pp. 9 – 10

Travel Times

Table 30 summarizes the existing travel times through this portion of the Corridor, based on the floating car runs conducted by AECOM in April 2016.

Table 30 *Travel Times*

Route	Time/Direction	Free Flow Travel Time (min)	Travel Time during Peak (min)
US 101 (Harney Way – I-80)	AM NB	4.3	14.0
	AM SB	4.0	7.7
	PM NB	4.3	19.4
	PM SB	4.0	7.8
I-280 (US 101 – 5th/King)	AM NB	4.1	11.5
	AM SB	3.5	3.6
	PM NB	4.1	6.1
	PM SB	3.5	6.7

Safety

Accident data for US 101 within the study limits was provided by Caltrans for the three-year period from August 1, 2012 through July 31, 2015. Table 31 summarizes the accident data.

Table 31 *Three-Year Accident Analysis for US 101 Mainline from August 1, 2012 to July 31, 2015*

Location	Post Miles	Number of Collisions Total	Actual Accident Rate per million vehicle miles			Average Accident Rate per million vehicle miles		
			Total	F	F + I*	Total	F	F + I
SM US 101 SF US 101 SF I-280	R20.72 – 26.11 0.00 – R5.07 0.00 – T7.45	429 1769 684	0.35 to 1.47	0.002	0.14 to 0.47	0.92 to 1.18	0.004 to 0.006	0.29 to 0.37

Source: Caltrans, TASAS-TSN report

* F = Fatal, I = Injury

5.2 Future Operating Conditions and Alternatives

This section describes the future US 101 Corridor performance mainly derived from the following reports:

- *The Project Report (August 2015) and the accompanying Final Traffic Operations Analysis Report (June 2014) for the US 101 Express Lanes Project in Santa Clara County*. The study limits are from the US 101/Tennant Avenue Interchange in Morgan Hill (SCL, US 101, PM 15.1) to the San Mateo County line just north of the Embarcadero Road interchange in Palo Alto (SCL, US 101, PM 52.6).
- *The Draft Final Traffic Operations Analysis Report for the US 101 Managed Lanes Project in San Mateo County (August 2017).* The study limits are from Rengstorff Avenue, Mountain View in Santa Clara County (SCL, US 101, PM 50.6) to East Grand Avenue, South San Francisco in San Mateo County (SM, US 101, PM 21.8).
- *Draft Final Report for the San Francisco Freeway Corridor Management Study Phase 2 (January 2017)* (also known as the San Francisco Freeway Performance Initiative study [SFPPI])*,* prepared by the San Francisco County Transportation Authority. The study limits are US 101 from the US 101/I-380 interchange in San Bruno (SM, US 101, PM 20.7) to the US 101/I-80 interchange (SF, US 101, PM 4.2), and I-280 within San Francisco (SF, I-280, PM 0.0-7.5).

Because these reports were developed for specific projects, the analyses include a comparison of the Build project conditions to the No-Build project conditions. In the San Francisco Freeway Corridor Management Study, two project alternatives are included for comparison.

Where data was not available in the reference sources listed above, data from the 2015 MTC Travel Demand Model and the 2013 VTA Travel Demand Model was used to provide a high-level overview of future freeway performances.

US 101 in Santa Clara County

This section documents the future conditions of Segments 1 and 2 of the US 101 South Corridor from San Benito/Santa Clara County line to Santa Clara/San Mateo County line just north of Oregon Expressway/Embarcadero Road.

Tennant Avenue to San Mateo County Line

This section summarizes the future conditions of the US 101 segment from Tennant Avenue in Morgan Hill to the San Mateo County line just north of Oregon Expressway/Embarcadero Road. The information

is mainly derived from the Santa Clara County US 101 Express Lanes Project Report (March 2015) and the accompanying TOAR (June 2014). The traffic analysis examines both near-term conditions in 2015 and long-term conditions in 2035, based on VISSIM micro-simulation models. For the purpose of this CCP, however, only the future conditions in 2035 are reported.

The future condition analysis includes an evaluation of the US 101 Express Lanes Project and compares the conditions under the Build scenario to those under the No Build scenario. The proposed Express Lanes Project will maintain mixed flow lanes as is and convert the existing HOV lanes along US 101 to Express Lanes. A second Express Lane will be added in both directions from Cochrane Road in Morgan Hill to SR 85 in San José and from Blossom Hill Road in San José to North Fair Oaks Avenue in Sunnyvale. The Express Lanes Project includes converting US 101/SR 85 HOV direct connectors in both directions in Mountain View to Express Lane connectors, creating an operational network with the Express Lanes proposed by the SR 85 Project. Total length of the project is 37.65 miles, which consists of 36.55 miles on US 101 and 1.1 miles on SR 85.

Travel Demand

Table 32 shows the forecast peak hour travel demand on US 101 in 2035 under two scenarios. In general, implementing the Express Lanes project will attract more vehicles to US 101 as the project is expected to reduce freeway congestion. The peak hours are defined as between 7:00 to 8:00 AM and between 5:00 and 6:00 PM.

Table 32 *Peak Hour Traffic Demand Volumes*

Direction/Time	No-Build	Build
NB/AM	5,382-11,126	5,950-11,752
SB/AM	4,378-11,156	4,373-11,534
NB/PM	2,722-8,877	3,009-9,499
SB/PM	5,416-10,934	6,238-11,791

Source: Santa Clara County US 101 Project Report–4.5.2, pp. 62 – 68, 2015

Travel Times

Table 33 shows the peak hour travel times under different scenarios in 2035. In the peak directions (AM NB and PM SB), HOV lanes/Express Lanes will offer significant time savings compared to GP lanes. During the AM peak hour in the northbound direction, the general purpose lanes show a 12.3-minute travel time saving between the No Build and Build scenarios, while the HOV/Express Lanes show an 11.9-minute travel time saving.

Table 33 *2035 Peak Hour Travel Time in Minutes*

Direction/ Time	Segment Group	Free Flow	Lane Type	No-Build	Build	Difference
NB/AM	Dunne Avenue on-ramp to Embarcadero Road on-ramp	33.4	GP	183.5	*171.2*	*-12.3*
			HOV	47.2	35.3	-11.9
SB/AM	San Antonio off-ramp to Dunne Avenue off-ramp	31.5	GP	40.8	39.4	-1.4
			HOV	32.4	31.8	-0.6
NB/PM	Dunne Avenue on-ramp to Embarcadero Road on-ramp	33.4	GP	40.5	40.4	-0.1
			HOV	32.9	33.1	0.2
SB/PM	San Antonio off-ramp to Dunne Avenue off-ramp	31.5	GP	100.5	109.7	9.2
			HOV	41.3	37.7	-3.6

Source: Santa Clara County US 101 Project Report–Table 5.2.18-3, pp. 117 – 118, 2015

During the PM peak hour in the southbound direction, there is a slight increase in travel time for the general purpose lanes and a moderate time saving of 3.6 minutes in the HOV/ Express Lanes between the No Build and Build scenarios. There are minimum or no travel time savings from the Express Lanes project in the non-peak directions (AM SB and PM NB).

Person-Throughput

To assess the impact of the proposed Express Lanes on the person-carrying capacity of the route, person throughput was measured at four locations along US 101. As shown in Table 34, the 2035 Build scenario is expected to produce higher person-throughput in both directions during both AM and PM peak hours at all locations, most notably through the middle of the Corridor.

Table 34 *Vehicle and Person-Throughput in 2035*

Location	Scenario	AM Peak Hour		PM Peak Hour	
		Vehicles	Persons	Vehicles	Persons
Northbound					
1. Coyote Creek on – Baily off	No-Build	7,154	9,626	5,176	6,729
	Build	8,602	11,092	5,348	7,048
2. Old Oakland on – NB I-880 off	No-Build	6,200	8,193	6,212	7,893
	Build	6,745	9,058	6,923	8,883
3. San Tomas/ Montague on – Great America off	No-Build	6,886	8,608	7,655	9,703
	Build	7,277	9,592	8,668	10,830
4. Rengstorff on – San Antonio off	No-Build	7,841	10,102	7,968	10,446
	Build	8,796	11,642	8,306	10,620
Southbound					
1. Rengstorff on – Middlefield on	No-Build	7,823	10,255	4,884	7,038
	Build	8,247	11,031	5,476	7,723
2. De La Cruz on – SR 87 off	No-Build	7,361	9,006	8,527	11,460
	Build	7,868	9,643	10,029	12,593
3. McKee/Julian off – Santa Clara off	No-Build	5,451	6,859	7,225	9,152
	Build	5,824	7,183	8,604	10,654
4. Coyote Creek on – Cochrane off	No-Build	6,497	8,360	7,940	10,385
	Build	6,701	8,239	9,169	11,438

Source: US 101 Express Lanes, TOAR 2014, 7.1.4, p. 70

Network Performance Measures

The 2035 performance measures for the Build and No Build scenarios are summarized in Table 35 for the AM peak period and Table 36 for the PM peak period. Overall, the 2035 traffic operations analysis shows the following improvement in operations in peak directions.

NB AM Peak Period:

- 4% reduction in total hours of delay
- 6% reduction in average delay
- 11% increase in average speed

SB PM Peak Period:

- 13% reduction in total hours of delay
- 18% reduction in average delay
- 23% increase in average speed

Table 35 *2035 AM Peak Period Network Performance*

Performance Measure	NB			SB		
	No-Build	Build	% Difference	No-Build	Build	% Difference
Total Distance Traveled (VMT) (mi)	949,052	1,033,145	9%	1,374,606	1,435,235	4%
Total Travel Time (VHT) (hr)	71,167	69,760	-2%	37,846	35,118	-7%
Total Delay (VHD) (hr)	55,893	53,580	-4%	14,786	11,285	-24%
Average Delay per Vehicle (sec)	1,397	1,314	-6%	357	269	-25%
Average Speed (mph)	13	15	11%	36	41	13%

Source: US 101 Express Lanes, TOAR 2014, Tables 7.1 and 7.2, p. 65

Table 36 *2035 PM Peak Period Network Performance*

Performance Measure	NB			SB		
	No-Build	Build	% Difference	No-Build	Build	% Difference
Total Distance Traveled (VMT) (mi)	917,408	1,005,987	10%	1,472,285	1,729,834	17%
Total Travel Time (VHT) (hr)	19,330	17,774	-8%	81,346	77,929	-4%
Total Delay (VHD) (hr)	3,211	2,681	-16%	56,599	49,398	-13%
Average Delay per Vehicle (sec)	71	62	-13%	1,119	914	-18%
Average Speed (mph)	52	52	1%	18	22	23%

Source: US 101 Express Lanes, TOAR 2014 Tables 7.6 and 7.7, pp. 74 – 75

Summary of 2035 Conditions

Overall, the proposed project produces significant benefits along the US 101 Corridor in 2035. These benefits include increases in both vehicle and person-throughput, average speed, reductions in total travel time, along with total delay and average delay.

Vehicle-hours traveled (VHT), vehicle-hours of delay (VHD), average delay, and speed benefits all reflect the reduced congestion levels achieved under the Build scenario where the US 101 Express Lanes Project is implemented. During the AM peak period, the proposed Project reduces the total delay by 2,314 hours (-4%) in the northbound direction and 3,501 hours (-24%) in the southbound direction. Significant delay reductions are also achieved in the PM peak period (-530 hours northbound and -7,201 hours southbound). Overall, the proposed US 101 Express Lanes are expected to produce a combined reduction of 13,546 vehicle hours of delay during the AM and PM peak periods on a typical weekday in 2035. It is important to recognize that these results are achieved while serving higher vehicular and person-throughput.

The project may result in an increase in VMT. This increase is a reflection of two factors: 1) with the reduced congestion, vehicles can more easily travel through the network and reach their destination; and 2) under the Build scenario, demand volumes on US 101 increase which in turn can lessen demand and improve conditions on other facilities. In other words, while there is an undesired increase in VMT on US

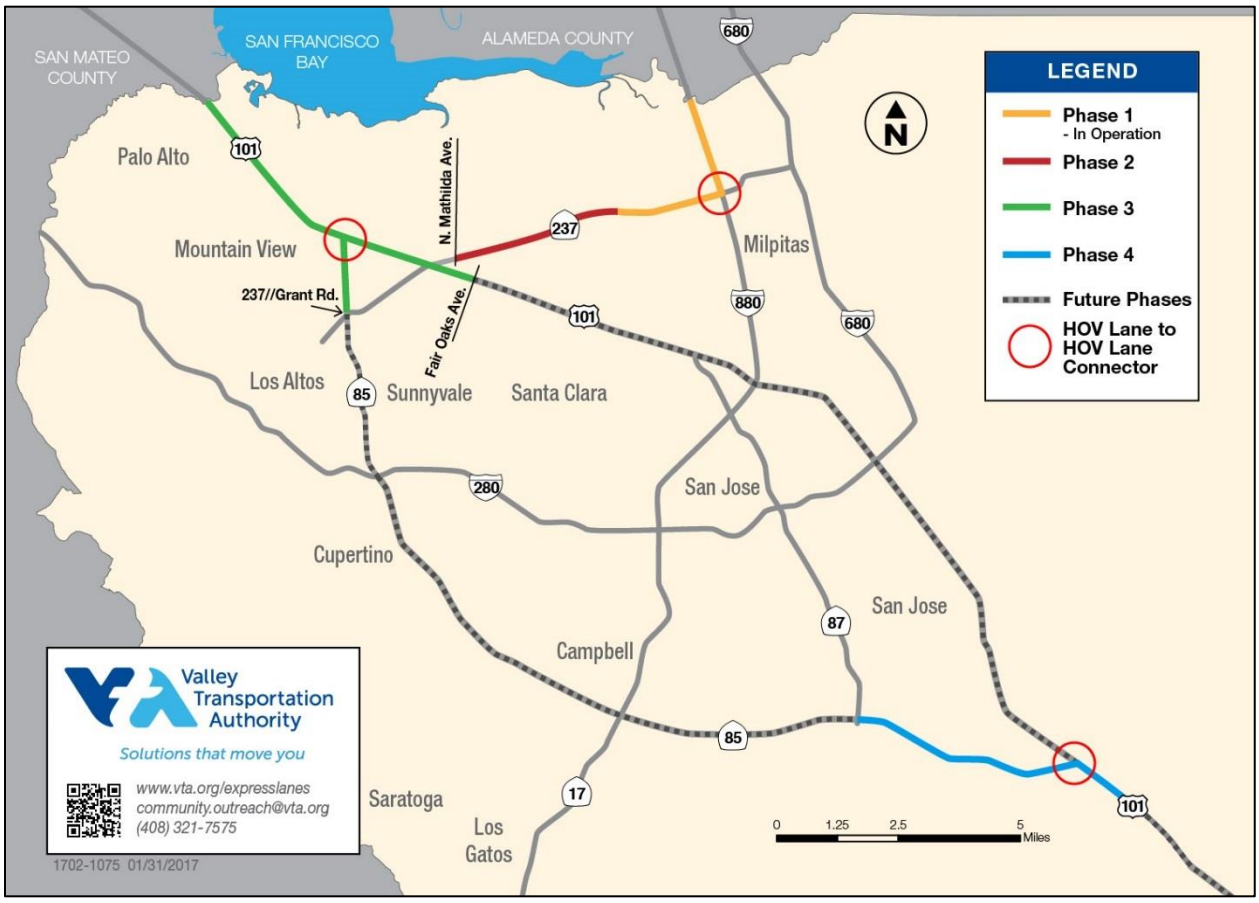
101, the global net increase in VMT within the US 101 Corridor may be mitigated due to route shifting from other routes to US 101.

Silicon Valley Express Lanes Program

Santa Clara VTA has an express lanes program that ties into the Bay Area region's planned 550-mile express lanes network. The current program includes the following projects on or near US 101:

- Phase 2 – SR 237 Express Lanes Project (extension to Mathilda Avenue, Sunnyvale), Fall 2019
- Phase 3 – US 101/SR 85 Express Lanes Project (from San Mateo/Santa Clara County Line to Fair Oaks Avenue, Sunnyvale and SR 85 to SR 237/Grant Road, Mountain View that includes US 101/SR 85 Connector, Summer 2021
- Phase 4 – SR 85/SR 87 Interchange to US 101 that includes US 101/SR 85 Connector, Fall 2021
- Future Phases – US 101 Mountain View to Santa Clara/San Benito County line

Figure 32 *Silicon Valley Express Lanes*



Source: VTA.org, VTA Silicon Valley Express Lanes Program

VTA's 2025 Transportation Model shows that approximately 25 percent to 35 percent of travelers using the I-880/SR 237 Express Lanes Connector will continue to their destination using US 101 and are likely to use the express lanes network.

San Benito County Line to Tennant Avenue

This section documents the future condition of the US 101 segment from the San Benito County line to Tennant Avenue in Morgan Hill. The information is derived from the MTC Travel Demand Model and the VTA Travel Demand Model that is based on the MTC Model. Both models assume the current four-lane facility south of the Monterey Road interchange will become a six-lane facility in 2040.

Table 37 *2040 Peak Hour Volumes*

US 101 locations	2015 AADT	2013 AM Peak Hour	2013 PM Peak Hour	2040 AM Peak Hour	2040 PM Peak Hour
San Benito County line	54,000	3253	3247	6258	6090
SR 25	77,000	3112	3129	5026	4640
Monterey Road	72,000	4105	4144	6758	6909
Gilroy, SR 152 East	95,000	4315	4084	6868	7066
Gilroy, SR 152 West	102,000	5791	5904	7930	8315
Masten Avenue	113,000	6929	7256	8252	8393
San Martin	114,000	7594	8025	8717	8938
Tennant Avenue	122,000	8069	8294	9141	9350

Source: MTC Travel Demand Model, 2017 and VTA Travel Demand Model, 2017

US 101 in San Mateo County

This section summarizes the future conditions of the US 101 South Corridor in Segment 3 from the Santa Clara County line to Whipple Avenue in Redwood City and Segment 4 from Whipple Avenue to the US 101/I-380 interchange. Information presented in this section is mostly derived from the TOAR for the US 101 Managed Lanes Project in San Mateo County. The study limits of the TOAR is from the US 101/Rengstorff Avenue interchange in Mountain View to the US 101 /East Grand Avenue in South San Francisco, north of I-380. Note that there is an overlap (from Rengstorff Avenue to Santa Clara/San Mateo County line) between this TOAR and the study limits of the Santa Clara US 101 Express Lanes Project Report discussed earlier.

The proposed San Mateo Managed Lanes Project will convert the existing HOV lane to Express Lanes between Matadero Creek in Palo Alto (Santa Clara County) and Whipple Avenue in both directions and will add a new Express Lane from Whipple Avenue to Interstate-380 in both directions. The future condition analysis in this CCP includes an evaluation of the US 101 Express Lanes Project and compares the conditions under the Build scenario to those under the No-Build scenario.

The analysis examines both near-term 2020 conditions (opening year) and future 2040 conditions, using the VISSIM microsimulation tool with assumptions regarding the influence of dynamic pricing on demand, implemented during the AM and PM peak periods for both years.

2020 Operating Conditions

Traffic operating conditions for the US 101 Managed Lanes Project were analyzed using VISSIM simulation models. To create the 2020 models, the calibrated Existing Condition models were modified to reflect the 2020 forecasted demands and network improvements.

Bottlenecks

Table 38 and Table 39 list 2020 bottlenecks in the general purpose lanes and their respective queue lengths under the No-Build and Build scenarios. Figure 33 and Figure 34 illustrate bottleneck and congestion locations. In addition, HOV lanes experienced congestion in the northbound direction during the AM peak period and in both directions during the PM peak period due to operational degradation of the GP lanes.

Table 38 *2020 Bottlenecks No Build Scenario*

Direction/ Time	Location	Queue Length	End of the Queue
NB/AM	Rengstorff Avenue loop off-ramp/diagonal off-ramp	1.0+ miles	Extends beyond the study area
	Third Avenue off-ramp and the 3rd Avenue on-ramp	16.4 miles	Merges with Rengstorff bottleneck
	Peninsula Avenue ramps	1.2 miles	Third Avenue
	Grand Avenue ramps	4.2 miles	Millbrae Avenue I/C
SB/AM	Grand Avenue and South Airport Boulevard ramps	4.0+ miles	Extends beyond the study area
	Westbound and eastbound Hillsdale Boulevard onramps	5.4 miles	Broadway I/C
	Whipple Avenue lane drop	2.9 miles	Ralston Avenue
	Willow Road ramps	0.2 miles	-
NB/PM	Hillsdale Boulevard on-ramp to SR 92 off-ramp	1.3+ miles	Extends beyond the study area
	Peninsula Avenue ramps	2.8 miles	Merges with SR 92 bottleneck
	San Francisco Airport and San Bruno Avenue ramps	1.3 miles	South of Millbrae Avenue
SB/PM	Millbrae Avenue ramps	8.2+ miles	Extends beyond the study area
	Third and Fourth Avenue to SR 92/Fashion Island off-ramp	1.6 miles	Merges with Millbrae Avenue bottleneck
	Woodside Road to Marsh Road off-ramp	4.8 miles	Holly Street
	Rengstorff Avenue on-ramp merge	2.6 miles	Embarcadero Road
	Willow Road (SR 114) ramps	0.2 miles	-

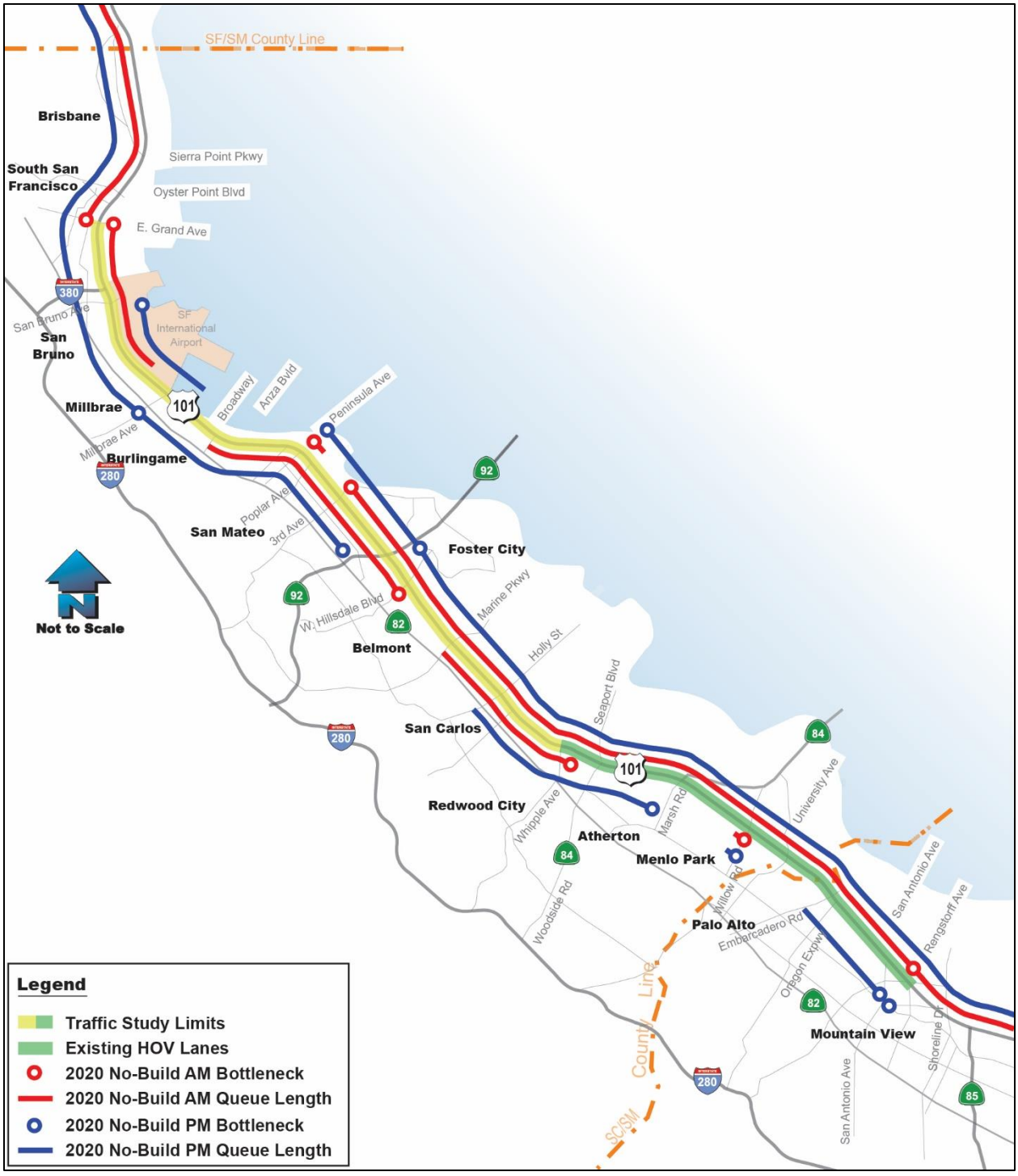
Source: San Mateo US 101 Managed Lanes, TOAR 2017, 5.1, pp. 79 – 81

Table 39 *2020 Bottlenecks Build Scenario*

Direction/ Time	Location	Queue Length	End of the Queue
NB/AM	Rengstorff Avenue ramps	1.0+ miles	Extends beyond the study area
	University Avenue (SR 109) ramps	2.1 miles	Near San Antonio Road
	Woodside Road (SR 84) ramps	3.5 miles	Willow Road
	Peninsula Avenue and Anza Boulevard ramps	6.3 miles	Holly Street
	Grand Avenue ramps	7.4 miles	Merge with Peninsula Avenue bottleneck
SB/AM	Grand Avenue and South Airport Boulevard ramps	4.4+ miles	Extends beyond the study area
	Woodside Road ramps	5.8 miles	Hillsdale Boulevard
	University Avenue ramps	4.5 miles	Merge with Woodside Road bottleneck
NB/PM	University Avenue ramps	4.8+ miles	Extends beyond the study area
	Hillsdale Boulevard on-ramp to SR 92 off-ramp	0.75 miles	Merge with University Avenue bottleneck
	Peninsula Avenue and Anza Boulevard ramps	2.8 miles	Merge with SR 92 bottleneck
	San Francisco Airport and San Bruno ramps	1.3 miles	South of SFO I/C
	Grand Avenue ramps	2.3 miles	Merge with upstream bottleneck
SB/PM	Grand Avenue and South Airport Boulevard ramps	4.4+ miles	Extends beyond the study area
	Third and Fourth Avenue to SR 92/Fashion Island off-ramp	10.2 miles	Grand Avenue
	Woodside Road to Marsh Road (SR 84) off-ramp	5.0 miles	Holly Street
	Willow Road (SR 114) ramps	0.2 miles	-
	Rengstorff Avenue ramps	2.6 miles	Embarcadero Road

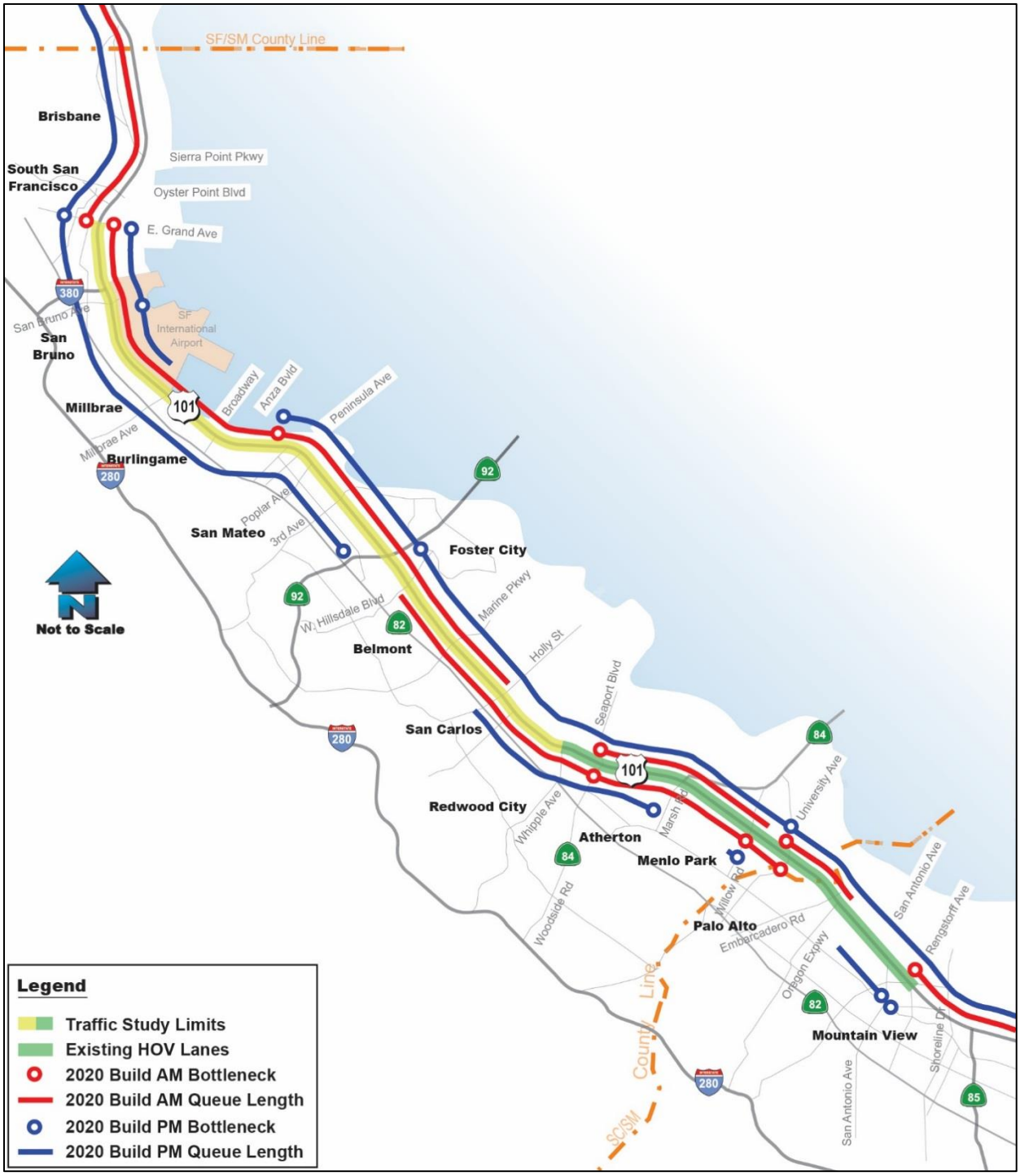
Source: San Mateo US 101 Managed Lanes, TOAR 2017, 5.2, pp. 83 – 85

Figure 33 *2020 Bottlenecks No Build Scenario*



Source: San Mateo US 101 Managed Lanes, TOAR 2017—Figure 5.1, p. 82

Figure 34 *2020 Bottlenecks Build Scenario*



Source: San Mateo US 101 Managed Lanes, TOAR 2017—Figure 5.2, p. 86

Travel Times

Table 40 shows the travel time comparison between the proposed No-Build and Build scenarios during the AM peak period in 2020. In the northbound direction for the entire length of the segment, the Build scenario offers anywhere between four to 27 minutes of travel time savings in the general purpose lanes and between four minutes and 38 minutes in the HOV/Express Lane compared to the No-Build alternative. In the southbound direction for the entire length of the segment, the Build scenario offers between zero and five minutes of travel time savings for vehicles traveling in the general purpose lane between 6:00 AM and 9:00 AM compared to the No-Build scenario. Vehicles traveling after 9:00 AM in the southbound direction would experience longer travel times compared to the No-Build scenario, due to an increase of 35 to 37 percent more traffic on US 101 (mostly arriving from SR 92). The Build scenario offers travel time savings anywhere between one minute and 22 minutes in the HOV/ Express Lane compared to the No-Build scenario. The Express Lanes are expected to operate with little or no delay relative to the free-flow conditions and will offer significant time savings compared to the general purpose lanes in both directions.

Table 40 *2020 AM Peak Travel Time Comparison*

Segment	Distance (Miles)	Free-Flow (Mins)	Hour	GP Lane Travel Time (Mins)			HOV/Express Lane Travel Time (Mins)		
				No-Build	Build	% Difference	No-Build	Build	% Difference
Northbound									
San Antonio Road to I-380	22.65	21	6:00	25	21	-16%	25	21	-16%
			6:30	28	21	-25%	28	21	-25%
			7:00	36	24	-33%	35	21	-40%
			7:30	49	37	-24%	47	22	-53%
			8:00	67	52	-22%	61	23	-62%
			8:30	84	63	-25%	59	25	-58%
			9:00	87	68	-22%	59	25	-58%
			9:30	74	47	-36%	44	24	-45%
Southbound									
I-380 to San Antonio Road	23.10	21	6:00	22	21	-5%	22	21	-5%
			6:30	22	22	0%	22	21	-5%
			7:00	26	24	-8%	25	21	-16%
			7:30	35	31	-11%	33	22	-33%
			8:00	46	41	-11%	44	22	-50%
			8:30	45	44	-2%	43	23	-47%
			9:00	40	45	13%	38	23	-39%
			9:30	33	49	48%	32	24	-25%

Source: San Mateo US 101 Managed Lanes, TOAR 2014, Tables 5.5 and 5.6, pp. 93 – 94

Table 41 shows the travel time comparison between the No-Build and Build scenarios during the PM peak period in 2020. In the northbound direction and for the entire length of the segment, the Build scenario offers anywhere between twelve minutes and 59 minutes of travel time savings in the general purpose lanes and between 17 minutes and 67 minutes in the HOV/Express Lane compared to the No-Build alternative. In the southbound direction, for the entire length of the segment, the Build scenario has minor

positive or negative travel time impacts for vehicles in the general purpose lanes. The Build scenario offers travel time savings anywhere between three minutes and 36 minutes in the HOV/Express Lane compared to the No-Build scenario. The Express Lanes are expected to operate with relatively little or no delay relative to the free-flow conditions and will offer significant time savings compared to the general purpose lanes in both directions.

Table 41 *2020 PM Peak Travel Time Comparison*

Segment	Distance (Miles)	Free-Flow (Mins)	Hour	GP Lane Travel Time (Mins)			HOV/Express Lane Travel Time (Mins)		
				No Build	Build	% Difference	No Build	Build	% Difference
Northbound									
San Antonio Road to I-380	22.65	21	3:00	38	26	-32%	38	21	-45%
			3:30	50	33	-34%	45	22	-51%
			4:00	74	48	-35%	53	23	-57%
			4:30	138	79	-43%	82	26	-68%
			5:00	162	131	-19%	101	34	-66%
			5:30	156	134	-14%	99	41	-59%
			6:00	149	127	-15%	95	43	-55%
			6:30	140	122	-13%	90	42	-53%
Southbound									
I-380 to San Antonio Road	23.10	21	3:00	25	24	-4%	24	21	-13%
			3:30	29	29	0%	27	22	-19%
			4:00	34	35	3%	31	22	-29%
			4:30	46	47	2%	40	22	-45%
			5:00	62	60	-3%	50	25	-50%
			5:30	71	74	4%	61	25	-59%
			6:00	68	72	6%	57	24	-58%
			6:30	58	55	-5%	52	24	-54%

Source: San Mateo US 101 Managed Lanes, TOAR 2017, Tables 5.7 and 5.8, pp. 95 – 96

Network Performance Measures

Table 42 summarizes the 2020 AM peak period network performance for the No-Build and Build scenarios. In the northbound direction, the Build scenario produces significant benefits compared to the No-Build scenario, including a twelve percent reduction in VHT, a reduction of 23 percent in VHD, 24 percent reduction in average delay per vehicle, and a five mph increase in average speed. The Build scenario is also expected to result in a 33 percent increase in HOV person-throughput and a 13 percent increase in total person-throughput. In the southbound direction, the Build scenario does not produce improvements in average speed, but has a greater HOV and total person-throughput. However, because of the predicted higher traffic demand in the Build scenario, it will also result in an increase in VHT, VHD, and Average Delay.

Table 42 *2020 AM Peak Period Network Performance Measure Results*

Performance Measure	Northbound			Southbound		
	No Build	Build	% Difference	No Build	Build	% Difference
Vehicle Throughput						
Total Distance Traveled (VMT) (veh/mi)	1,121,388	1,142,978	2%	1,001,085	1,373,701	37%
Total Travel Time (VHT) (veh/hr)	38,474	33,947	-12%	24,732	35,409	43%
Total Delay (VHD) (veh/hr)	21,498	16,642	-23%	9,462	14,567	54%
Average Delay per Vehicle (sec/veh)	599	453	-24%	276	400	45%
Average Speed (mph)	29	34	16%	41	39	-4%
Person Throughput						
HOV (HOV 2, 3+ and Buses)	49,531	65,819	33%	49,830	63,251	27%
HGV (Trucks)	5,244	4,921	-6%	5,276	4,729	-10%
Cars (SOV or Drive Alone)	91,486	94,731	4%	92,040	91,034	-1%
Total Person Throughput	146,261	165,471	13%	147,146	159,014	8%

Source: San Mateo US 101 Managed Lanes, TOAR 2017—Tables 5.1 and 5.2, p. 88

Table 43 summarizes the 2020 PM peak period network performance for the No-Build and Build scenarios. In the northbound direction, the Build scenario produces significant benefits compared to the No-Build scenario, including a seventeen percent reduction in VHT, a reduction of 26 percent in VHD, 29 percent reduction in average delay per vehicle, and a six mph increase in average speed. The Build scenario is expected to result in a 61 percent increase in HOV person-throughput and a twenty percent increase in total person-throughput. In the southbound direction, the Build scenario produces improvements in HOV and total person-throughput. However, it will also result in an increase in VHT, VHD, Average Delay and Average Speed similar to the AM peak period results.

Table 43 *2020 PM Peak Period Network Performance Measure Results*

Performance Measure	Northbound			Southbound		
	No Build	Build	% Difference	No Build	Build	% Difference
Vehicle-Throughput						
Total Distance Traveled (VMT) (veh/mi)	1,028,374	1,185,034	15%	1,000,654	1,349,330	35%
Total Travel Time (VHT) (veh/hr)	68,422	57,131	-17%	34,595	43,918	27%
Total Delay (VHD) (veh/hr)	52,722	39,068	-26%	19,178	23,263	21%
Average Delay per Vehicle (sec/veh)	1,290	916	-29%	479	557	16%
Average Speed (mph)	15	21	38%	29	31	6%
Person-Throughput						
HOV (HOV 2, 3+ and Buses)	41,382	66,422	61%	47,007	67,507	44%
HGV (Trucks)	5,321	3,869	-27%	6,044	5,455	-10%
Cars (SOV or Drive Alone)	96,362	101,890	6%	109,459	107,739	-2%
Total Person-Throughput	143,064	172,182	20%	162,509	180,701	11%

Source: San Mateo US 101 Managed Lanes, TOAR 2017—Tables 5.3 and 5.4, pp. 89 – 90

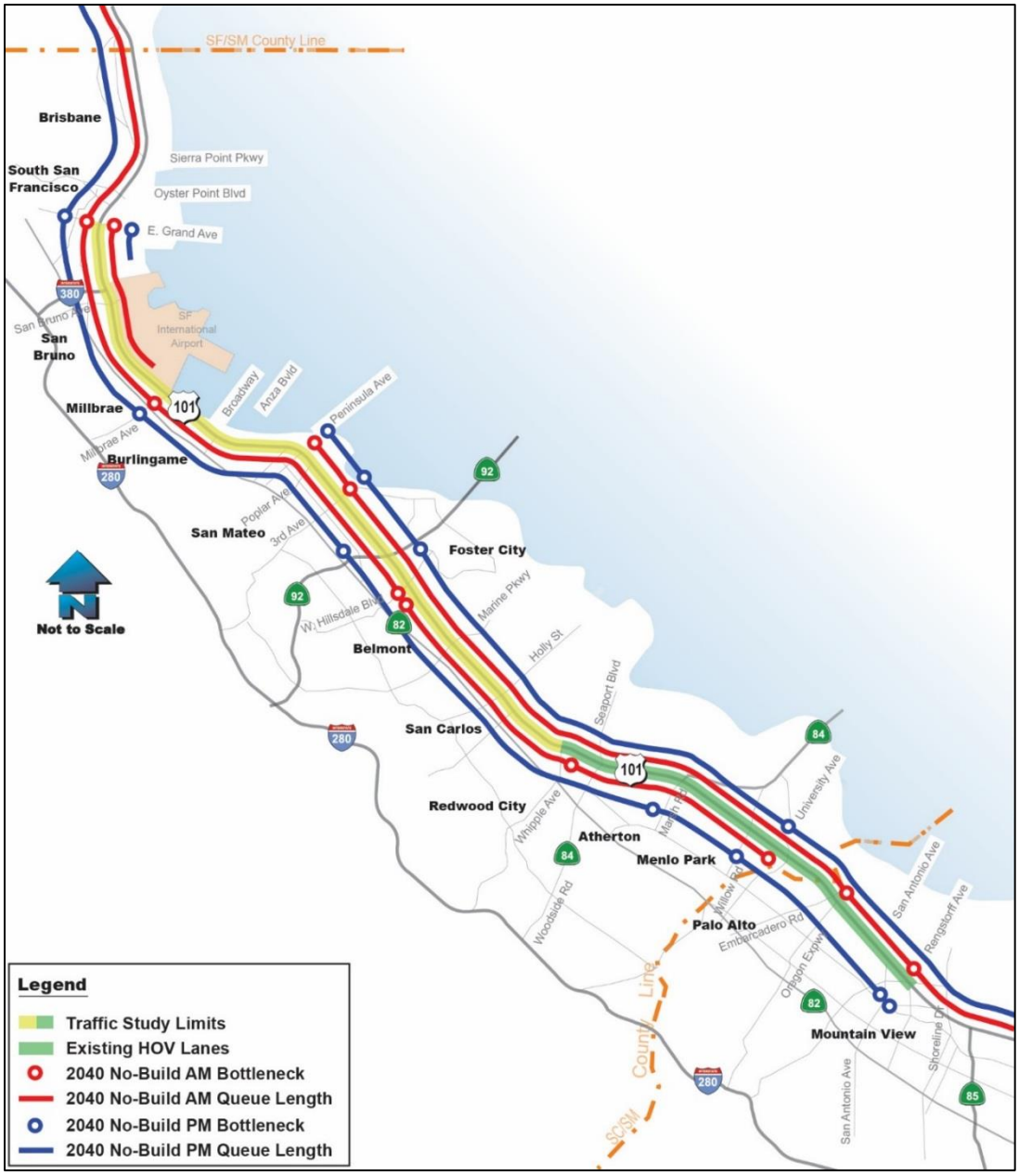
2040 Operating Conditions

Traffic operating conditions for the US 101 Managed Lanes Project were analyzed using VISSIM simulation models. To create the 2040 models, the calibrated 2020 models were modified to reflect the 2040 network change and future forecasted demands.

Bottlenecks

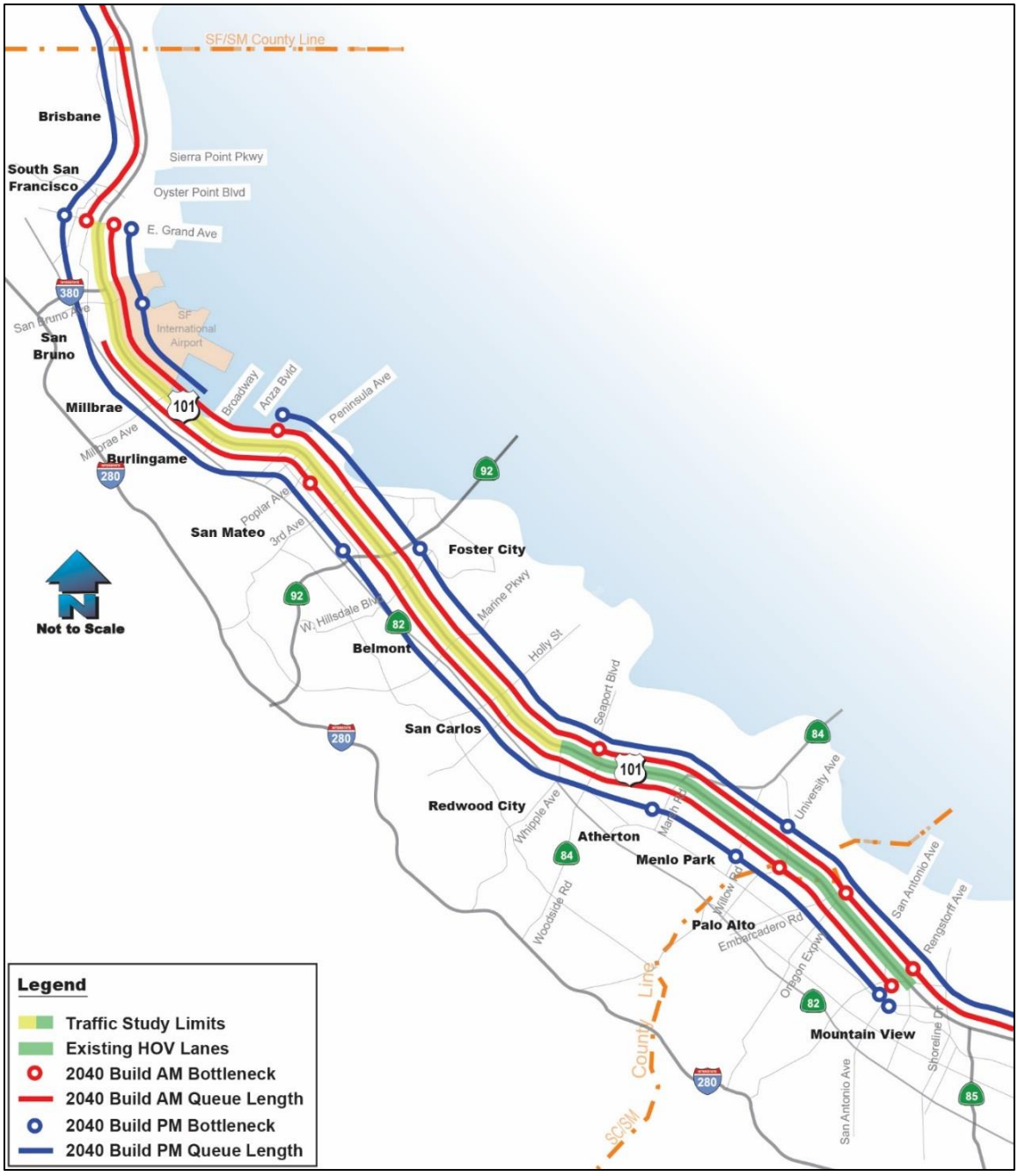
As shown in Figure 35 and Figure 36, congestion will continue to grow in the Corridor in 2040 and queues from most of the bottlenecks in the general purpose lanes are forecasted to grow and merge with each other both under the No Build and Build scenarios.

Figure 35 *2040 Bottlenecks No Build Scenario*



Source: San Mateo US 101 Managed Lanes, TOAR 2017—Figure 6.1, p. 124

Figure 36 *2040 Bottlenecks Build Scenario*



Source: San Mateo US 101 Managed Lanes, TOAR 2017—Figure 6.2, p. 128

Travel Times

Table 44 shows the travel time comparison between the No-Build and Build scenarios during the AM peak period in 2040. In the northbound direction and for the entire length of the segment, the Build scenario offers anywhere between nine minutes and 67 minutes of travel time savings for vehicles traveling in the general purpose lane between 6:00 AM and 9:00 AM compared to the No-Build scenario. The vehicles

traveling after 9:00 AM would experience longer travel times. The Build scenario offers travel time savings between eleven minute and 65 minutes in the HOV/Express Lane compared to the No-Build scenario. The Express Lanes are expected to operate with little or no delay relative to the free-flow conditions between 6:00 AM and 9:00 AM, but they will experience some congestion after 9:00 AM.

In the southbound direction and for the entire length of the segment, the Build scenario offers travel time savings much of the time in the general purpose lanes, but not always. The Build scenario offers travel time savings between one minute and 103 minutes in the HOV/Express Lane compared to the No-Build alternative. The Express Lanes are expected to operate with little or no delay relative to the free-flow conditions.

Express lanes offer significant travel time savings regardless of congestion as compared to the general purpose lanes.

Table 44 *2040 AM Peak Travel Time Comparison*

Segment	Distance (Miles)	Free-Flow (Mins)	Hour	GP Lane Travel Time (Mins)			HOV/Express Lane Travel Time (Mins)		
				No Build	Build	% Difference	No Build	Build	% Difference
Northbound									
San Antonio Road to I-380	22.65	21	6:00	32	23	-28%	32	21	-34%
			6:30	43	23	-47%	43	21	-51%
			7:00	71	32	-55%	68	22	-68%
			7:30	111	56	-50%	80	24	-70%
			8:00	150	86	-43%	93	28	-70%
			8:30	143	111	-22%	88	34	-61%
			9:00	124	132	6%	80	42	-48%
			9:30	107	135	26%	64	48	-25%
Southbound									
I-380 to San Antonio Road	23.10	21	6:00	23	23	0%	22	21	-5%
			6:30	23	23	0%	22	21	-5%
			7:00	30	28	-7%	28	22	-21%
			7:30	51	50	-2%	41	23	-44%
			8:00	83	91	10%	63	26	-59%
			8:30	119	106	-11%	95	29	-69%
			9:00	146	110	-25%	124	30	-76%
			9:30	152	126	-17%	131	28	-79%

Source: San Mateo US 101 Managed Lanes, TOAR 2017, Tables 6.5 and 6.6, pp. 136 – 137

Table 45 shows the travel time comparison between the No-Build and Build scenarios during the PM peak period in 2040. In the northbound direction and for the entire length of the segment, the Build scenario offers anywhere between twenty minutes and 99 minutes of travel time savings in the general purpose lanes and between 26 minutes and seventy minutes in the HOV/Express Lane compared to the No-Build alternative.

In the southbound direction, for the entire length of the segment, the Build scenario offers travel time savings anywhere between one minute and 43 minutes in the HOV/Express Lane compared to the No-Build scenario. However, the general purpose lanes are expected to have slower times compared to the No-Build scenario. In both directions, Express Lanes offer significant travel time savings regardless of congestion compared to the general purpose lanes.

Table 45 *2040 PM Peak Travel Time Comparison*

Segment	Distance (Miles)	Free-Flow (Mins)	Hour	GP Lane Travel Time (Mins)			HOV/Express Lane Travel Time (Mins)		
				No Build	Build	% Difference	No Build	Build	% Difference
Northbound									
San Antonio Road to I-380	22.65	21	3:00	49	29	-41%	47	21	-55%
			3:30	71	41	-42%	58	23	-60%
			4:00	114	60	-47%	72	24	-67%
			4:30	206	107	-48%	99	29	-71%
			5:00	235	143	-39%	102	43	-58%
			5:30	213	147	-31%	102	47	-54%
			6:00	187	142	-24%	98	48	-51%
			6:30	190	138	-27%	98	45	-54%
Southbound									
I-380 to San Antonio Road	23.10	21	3:00	25	30	20%	24	23	-4%
			3:30	32	43	34%	29	23	-21%
			4:00	43	66	53%	35	26	-26%
			4:30	62	97	56%	42	28	-33%
			5:00	84	151	80%	51	33	-35%
			5:30	108	194	80%	64	40	-38%
			6:00	118	176	49%	79	39	-51%
			6:30	105	195	86%	78	35	-55%

Source: San Mateo US 101 Managed Lanes, TOAR 2017, Tables 6.7 and 6.8, pp. 138 - 139

Network Performance Measures

Table 46 summarizes the 2040 AM peak period network performance for the No-Build and Build scenarios. In the northbound direction, the Build scenario produces significant benefits compared to the No-Build scenario, including a six percent reduction in VHT, a reduction of 16 percent in VHD, 21 percent reduction in average delay per vehicle, and a five mph increase in average speed. The Build scenario is also expected to result in a 35 percent increase in HOV person-throughput and a 15 percent increase in total person-throughput.

In the southbound direction, the Build scenario produces improvements in Average Delay as well as HOV and total person-throughput. However, it will also result in negligible change in VHT, VHD, and Average Speed because of the predicted high demand in the Build scenario. This occurs most notably near the start of the traffic study limits during the AM peak period due to increased output volumes of upstream bottlenecks reaching the downstream segment.

Table 46 *2040 AM Peak Period Network Performance Measure Results*

Performance Measure	NB			SB		
	No Build	Build	% Difference	No Build	Build	% Difference
Vehicle-Throughput						
Total Distance Traveled (VMT) (veh-mi)	1,242,004	1,495,678	20%	1,420,125	1,416,991	0%
Total Travel Time (VHT) (veh-hr)	65,956	62,275	-6%	56,635	56,617	0%
Total Delay (VHD) (veh-hr)	47,169	39,668	-16%	35,053	35,127	0%
Average Delay per Vehicle (sec/veh)	1,279	1,011	-21%	952	908	-5%
Average Speed (mph)	19	24	28%	25	25	0%
Person-Throughput						
HOV (HOV 2, 3+ & Buses)	45,620	61,381	35%	45,153	60,956	35%
HGV (Trucks)	4,830	4,589	-5%	4,781	4,557	-5%
Cars (SOV or Drive Alone)	84,263	88,343	5%	83,400	87,731	5%
Total Person-Throughput	134,713	154,313	15%	133,334	153,244	15%

Source: San Mateo US 101 Managed Lanes, TOAR 2017, Tables 6.1 and 6.1, p. 130

Table 47 summarizes the 2040 PM peak period network performance for the No-Build and Build scenarios. In the northbound direction, the Build scenario produces significant benefits compared to the No-Build scenario, including a twelve percent reduction in VHT, a reduction of 19 percent in VHD, 23 percent reduction in average delay per vehicle, and a four mph increase in average speed. The Build scenario is also expected to result in a 58 percent increase in HOV person-throughput and an 18 percent increase in total person-throughput.

In the southbound direction, the Build scenario produces improvements in average speed as well as HOV and total person-throughput. However, it will also result in an increase in VHT, VHD, and Average Delay because of the improvement at the westbound Hillsdale on-ramp bottleneck and the increase in the output volumes of upstream bottlenecks that would allow additional demand to reach downstream locations.

Table 47 *2040 PM Peak Period Network Performance Measure Results*

Performance Measure	NB			SB		
	No Build	Build	% Difference	No Build	Build	% Difference
Vehicle-Throughput						
Total Distance Traveled (VMT) (veh-mi)	1,120,030	1,266,545	13%	1,422,641	1,557,701	9%
Total Travel Time (VHT) (veh-hr)	77,070	68,185	-12%	68,210	82,187	20%
Total Delay (VHD) (veh-hr)	60,004	48,888	-19%	46,439	58,426	26%
Average Delay per Vehicle (sec/veh)	1,439	1,110	-23%	1,062	1,327	25%
Average Speed (mph)	15	19	28%	21	19	-9%
Person-Throughput						
HOV (HOV 2, 3+ & Buses)	42,149	66,605	58%	46,000	62,644	36%
HGV (Trucks)	5,419	3,880	-28%	5,914	5,062	-14%
Cars (SOV or Drive Alone)	98,147	102,171	4%	107,115	99,978	-7%
Total Person-Throughput	145,715	172,657	18%	159,029	167,684	5%

Source: San Mateo US 101 Managed Lanes, TOAR 2017, Tables 6.3 and 6.4, p. 132

Summary of 2020 and 2040 Conditions

While the performance results from the proposed San Mateo US 101 Managed Lanes Project vary in terms of VHT, VHD, Average Delay per Vehicle and Average Speed, depending on the direction of travel, the peak period and the traffic analysis time frame, in most cases the Project will result in travel time savings in the general purpose lanes. In addition, implementing the managed lanes will produce greater total person-throughput and especially HOV person-throughput for all scenarios under both 2020 and 2040 conditions. Express lane users are also expected to enjoy significant time savings compared to the general purpose lane users. While there is an increase in VMT due to the project, the results are based on Vissim simulation model that examines only US 101 without taking into account the effect on the entire roadway network. For example, according to the Alternative Screening Memorandum for the San Mateo Managed Lanes Project (September, 2017), when compared to the No-Build scenario, the network-wide VMT increase from the project is 1.3 percent during the AM peak period and 1.6 percent during the PM peak period in 2020, much lower than the VMT increase on US 101. In other words, the increase in VMT on US 101 is offset by a reduction in VMT on parallel routes within the Corridor due to route shifting to US 101.

US 101 in San Francisco and Northern San Mateo County

This section documents the future conditions for Segments 5, 6 and 7 of the US 101 South Corridor. Segments 5 and 6 are US 101 segments from the US 101/I-380 interchange in San Mateo County to I-80, including the Central Freeway section in San Francisco. Segment 7 is I-280 in San Francisco from the US 101/I-280 Interchange to the end of I-280.

The information in this section is mostly derived from the Freeway Corridor Management Study (FCMS) Phase 2 Draft Final Report (January 2017). There is an overlap (from I-380 to Grand Avenue) between the FCMS Draft Final Report and the study limits of the TOAR for the San Mateo US 101 Express Lanes Project discussed earlier. It should be noted that the FCMS Final Report is still being finalized as of the writing of the Draft CCP. As a result, information presented in this section is subject to change.

The future conditions analysis includes an evaluation of the US 101 Express Lanes Project and compares the conditions under the Build scenario to those under the No Build scenario. The proposed Managed Lanes Project includes two alternatives.

- Lane Conversion: Convert number one general purpose lane to a managed lane in the northbound direction from I-380 to San Mateo/San Francisco County line and in the southbound direction from the 5th Street/King Street on-ramp onto I-280, continuing onto US 101 to I-380.

- Lane Addition: In the US 101 northbound direction, add a managed lane from I-380 (SM, US 101, PM 20.0) to just north of the San Mateo/San Francisco County line (SF, US 101, PM 0.3), and on I-280 from 18th Street (SF, I-280, PM 6.6) northbound to 5th Street/King Street (SF, I-280, PM 7.5); In the US 101 southbound direction, add a managed lane from north of 3rd Street (SF, US 101, PM 1.0) to I-380 (SM, US 101, PM 20.0), and on I-280 from 5th Street/King Street (SF, I-280, PM 7.5) southbound to north of 25th Street (SF, I-280, PM 5.9). A lane conversion is included on I-280 from PM 5.9 to the US 101/I-280 interchange and continuing on US 101 to PM 1.0. It will also include a conversion of auxiliary lanes between Railroad Avenue and Oyster Point Boulevard in both directions.

Travel Demand and Vehicle Occupancy

Traffic conditions in the future No-Build scenario will not be appreciably different from the existing conditions described earlier and peak hour traffic growth is estimated to be in the order of two to four percent. No changes are foreseen in the share of HOV with two or more people in the 2020 No-Build scenario compared to 2015. Either project alternative will result in an increase in HOV percentages.

Table 48 *Percentage Vehicles with 2+ Occupants in 2020*

Route	Direction/time	No-Build	Lane Conversion	Lane Addition
US 101	NB/AM	18%	23%	20%
	SB/AM	13%	18-21%	17%
	NB/PM	20%	25%	22%
	SB/PM	22%	27-30%	26%
I-280	AM/NB	18%	22%	23%
	AM/SB	25%	28%	29%
	PM/NB	20%	24%	25%
	PM/SB	26%	29%	30%

Source: FCMS Draft Final Report 2017, Figure 10, p. 22

Bottlenecks

While the Lane Conversion alternative will not noticeably alter the bottleneck locations and queue lengths, the Lane Addition alternative will eliminate some bottlenecks or significantly reduce the queue lengths. Tables 49 to 51 compare the bottlenecks and their respective queue lengths for the No Build scenario and the two project alternatives, while Figures 37 to 39 provide illustration.

Table 49 *Bottleneck Conditions, No Build 2020 Scenario*

Direction/ Time	Location	Queue Length	End of the Queue
NB/AM	US 101 Oyster Point Boulevard	1.4 miles	I-380 I/C
	US 101 Cesar Chavez on-ramp (Hospital Curve)	1.2 miles	US 101/I-280 I/C
	I-280 Monterey Boulevard on	2.0 miles	San Jose Avenue
	I-280 I/C with US 101	1.7 miles	Alemany Boulevard
	I-280 off ramps 6th/Brannan and 5th/King Streets	0.5 miles	Mariposa Street
NB/PM	US 101 Bay Bridge Lower Deck	7.2 miles	US 101/I-280 I/C
	US 101 Oyster Point Boulevard on	- -	- -
	US 101 Sierra Point Parkway I/C	0.2 miles	Bayshore Boulevard
	I-280 interchange with US 101	0.5 miles	- -
	I-280 off ramps 6th/Brannan and 5th/King Streets	0.5 miles	Mariposa Street
SB/AM	US 101 Alana Way	0.4 miles	Tunnel Avenue
	US 101 Hospital Curve	- -	- -
SB/PM	US 101 Hospital Curve	7.2 miles	Bay Bridge Upper Deck
	I-280 Monterey Boulevard off	1.2 miles	US 101/I-280 I/C

Table 50 *Bottleneck Conditions, Lane Conversion 2020 Scenario*

Direction/ Time	Location	Queue Length	End of the Queue
NB/AM	US 101 South Airport Boulevard	- -	- -
	I-280 I/C with US 101	2.6 miles	San Jose Avenue
	I-280 off ramps 6th/Brannan and 5th/King Streets	0.5 miles	Mariposa Street
NB/PM	US 101 Bay Bridge Lower Deck	7.2 miles	US 101/I-280 I/C
	US 101 Oyster Point Boulevard on	0.3 miles	Oyster Point off
	US 101 Sierra Point Parkway I/C	0.2 miles	Bayshore Boulevard
	US 101 Harney Way off	2.3 miles	Sierra Point Parkway
	I-280 interchange with US 101	1.1 miles	- -
	I-280 off ramps 6th/Brannan and 5th/King Streets	0.5 miles	Mariposa Street
SB/AM	US 101 Bayshore Boulevard on	1.6 miles	Cesar Chavez Street
	US 101 Alana Way	0.4 miles	Tunnel Avenue
	US 101 Hospital Curve	- -	- -
SB/PM	US 101 Hospital Curve	7.2 miles	Bay Bridge Upper Deck
	US 101 Alana Way on	1.3 miles	Paul Avenue
	US 101 Sierra Point Parkway I/C	2.8 miles	Bayshore Boulevard off
	US 101 Produce Avenue off	1.3 miles	Airport Boulevard
	I-280 Pennsylvania Avenue I/C	1.3 miles	6th Street

Table 51 *Bottleneck Conditions, Lane Addition 2020 Scenario*

Direction/ Time	Location	Queue Length	End of the Queue
NB/AM	Bayshore Boulevard on	4.7 miles	Grand Avenue
	US 101 Cesar Chavez on-ramp (Hospital Curve)	0.9 miles	Cesar Chavez Street
	I-280 I/C with US 101	2.6 miles	San Jose Avenue
	I-280 off ramps 6th/Brannan and 5th/King Streets	0.5 miles	Mariposa Street
NB/PM	US 101 Bay Bridge Lower Deck	7.2 miles	US 101/I-280 I/C
	US 101 interchange with I-280	3.5 miles	Sierra Point Parkway
	I-280 interchange with US 101	1.1 miles	- -
	I-280 off ramps 6th/Brannan and 5th/King Streets	0.5 miles	Mariposa Street
SB/AM	US 101 interchange with I-280	0.7 miles	- -
	US 101 Hospital Curve	- -	- -
SB/PM	US 101 Hospital Curve	7.2 miles	Bay Bridge Upper Deck
	I-280 Pennsylvania Avenue I/C	1.3 miles	6th Street

Source: SFCTA Update, January 2018, original FCMS Draft Final Report 2017, Freeway Performance, pp. 19 – 21

Figure 37 *Expected Congestion Locations 2020 No Build*

Source: FCMS Draft Final Report 2017, Figure 13, p. 24

Figure 38 *Expected Congestion Location in 2020 Lane Conversion*

Source: SFCTA Update, January 2018; original FCMS Draft Final Report 2017, Figure 14, p. 25

Figure 39 *Expected Congestion Location in 2020 Lane Addition*

Source: SFCTA Update, January 2018; original FCMS Draft Final Report 2017, Figure 15, p. 26

Travel Times

HOV time savings were calculated for 2+ HOV vehicles. Table 52 shows time savings compared to the No-Build scenario for the managed lane users under both project alternatives. Table 53 shows travel time changes for general purpose lane users as a result of implementing the managed lane project.

Table 52 *2020 Peak Hour Travel Times in HOV Lanes Compared to No Build*

HOV Lane (2+ Occupancy)	**Lane Conversion**		**Lane Addition**	
	AM	PM	AM	PM
US 101 NB	- 6 minutes	- 6 minutes	- 6 minutes	- 6 minutes
US 101 SB	- 6 minutes	Same	- 2 minutes	Same
I-280 NB*	Same	- 1 minute	Same	- 1 minute
I-280 SB	Same	- 4 minutes	Same	Same

Source: SFCTA update, Jan 2018

* Traffic signal operations at freeway terminus excluded, further study required

Table 53 *2020 Peak Hour Travel Times in GP Lanes Compared to No Build*

General Purpose Lanes	**Lane Conversion**		**Lane Addition**	
	AM	PM	AM	PM
US 101 NB	+ 2 minutes	+ 4 minutes	- 1 minute	- 2 minutes
US 101 SB	+ 2 minutes	+ 1 minute	- 1 minute	Same
I-280 NB*	- 1 minute	Same	- 1 minute	Same
I-280 SB	Same	+ 1 minute	Same	+ 1 Minute

Source: SFCTA update, Jan 2018

* Traffic signal operations at freeway terminus excluded, further study required

Person-Throughput

Table 54 summarizes the changes in person-throughput relative to the No-Build scenario for both Lane Conversion and Lane Addition alternatives. Depending on the location and project alternative, the person-throughput can range from no change to a 29 percent increase.

Table 54 *Person-Throughput Changes Compared to No Build*

Direction/Time	Alternative	Location		
		Hospital Curve	County Line	North of SFO
NB/AM	Lane Convert	+ 12 %	+ 9 %	+ 10 %
	Lane Addition	+ 6 %	+ 10 %	+ 10 %
NB/PM	Lane Convert	+ 7 %	+ 2 %	+ 7 %
	Lane Addition	+ 7 %	+ 10 %	+ 14 %
SB/AM	Lane Convert	+ 5 %	+ 10 %	+ 14 %
	Lane Addition	+ 12 %	+ 22 %	+ 29 %
SB/PM	Lane Convert	+ 8 %	0 %	+ 12 %
	Lane Addition	+ 7 %	+ 6 %	+ 16 %

Source: FCMS Draft Final Report 2017, Figure 17, p. 26

Network Performance Measures

Table 55 summarizes the percent change in network performance measures compared to the No-Build scenario for both the Lane Conversion and Lane Addition alternatives.

Table 55 *Change in Performance*

Performance Measure	Alternative	Percent Change Compared to No Build Scenario
Person-Miles Traveled	Lane Conversion	+0.58%
	Lane Addition	+1.27%
Person-Hours Traveled	Lane Conversion	+0.59%
	Lane Addition	+0.39%
Vehicle-Miles Traveled	Lane Conversion	-0.13%
	Lane Addition	+1.18%
Vehicle-Hours Traveled	Lane Conversion	+0.38%
	Lane Addition	+0.43%
Daily CO2 Emissions	Lane Conversion	+0.17%
	Lane Addition	+0.99%

Source: FCMS Draft Final Report 2017, p. 28

Summary of 2020 Conditions

Overall, the lane conversion alternative would result in greater person-throughput, a net reduction in VMT and slightly increased daily carbon dioxide emissions. The lane addition alternative would result in significantly greater person-throughput, a net increase in VMT, and more carbon dioxide emissions compared to the lane conversion alternative.

Under either alternative, HOV users on US 101 would expect moderate time savings, while general purpose lane users may or may not see travel time savings, depending on the peak period and the direction of travel. The study results also show a greater time saving for HOV users on southbound I-280. However, southbound US 101 general purpose lane users may experience significantly more delays as the proposed project would convert a general purpose lane to a managed lane at the I-280/US 101 interchange. The northbound I-280 managed lane requires further study.

Chapter 6: Recommended Strategies

6.1 Project Lists

This section presents the recommended projects within the US 101 South Corridor. There are three major project categories: 1) highway and transit projects and multi-county programs, 2) bicycle and pedestrian projects and 3) projects in the SHOPP and the Ten-Year SHOPP Plan.

Highway and Transit Projects and Multi-County Programs

As shown in Table 53, the first group of projects include highway and transit projects as well as multi-county programs that may have significant impacts on the Corridor. 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.

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

The recommended transit strategies consist of a variety of projects. New capital projects include the BART extension to San Jose, the Caltrain Downtown Extension to the future Transbay Terminal, Santa Clara Valley Transportation Authority light rail extensions, several BRT and express bus service projects, a new ferry terminal in Redwood City and at Mission Bay/16th Street in San Francisco and the California High Speed Rail project. Other projects focus on improving the efficiency of existing transit services and making transit a more viable alternative to driving. Caltrain electrification and associated infrastructure and equipment improvements represent the largest transit efficiency improvement within the Corridor. In Santa Clara County, there are projects to improve the speed of light rail service as well as to improve existing bus stops; In San Mateo County, an Automated Transit Signal Priority project will help accommodate express rapid bus service along El Camino Real (SR 82); In San Francisco, a number of multimodal improvements are planned, focusing on major transit corridors and areas surrounding major transit hubs.

Table 53 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 2020/2021)
- Mid-term: between four and ten years (Fiscal Years 2021/2022-2026/2027)
- Long-term: more than ten years (beyond Fiscal Year 2026/2027)

Table 56 *US 101 South Future Highway, Transit, and Multi-County Projects*
(not in priority order)

Co.	Route	Begin Post mile	End Post mile	Title	Description	Cost ($M)	Short-Term (0-4 Years)	Medium-Term (4-10 Years)	Long-Term (10+ Years)	RTP ID
Highway Projects										
SCL	101	R6.10	R10.26	US 101 Express Lanes: Masten Ave. to 10th St.	New HOV/EL in both directions	$68.0			X	N/A*
SCL	101	2.53	R6.10	US 101 Express Lanes: 10th St. to SR 25	New HOV/EL in both directions	$50.0			X	N/A*
SCL	101	R9.12	R9.12	US 101/Buena Vista Ave. Interchange Improvements	Improve interchange at U.S. 101/Buena Vista Avenue.	$31.0		X		17-07-0035
SCL	101	3.17	3.17	US 101/SR 25 Interchange	The project consists of reconfiguring the interchange at US 101 and SR 25 just south of the City of Gilroy in Santa Clara County, connecting SR 25 and Santa Teresa Boulevard, and widening the existing freeway from 4 to 6 lanes from the Monterey Street interchange to the US 101/SR 25 interchange.	$185.0	X			17-07-0069
SCL	101	R6.10	R6.10	US 101/SR 152/10th St. Ramp and Intersection Improvements	Modify SB US 101 off-ramp to 10th St. and intersection in Gilroy. (Project extracted from PBA 2040 project ID 17-07-0079)	$11.0		X		17-07-0079
SCL	101	R10.26	R17.75	US 101 Express Lanes: Cochrane Rd. to Masten Ave.	New HOV/EL in both directions	$107.0		X		
SCL	Various	Various	Various	Noise Abatement Program (Countywide)	General noise abatement program for countywide (Project extracted from PBA 2040 project ID 17-07-0064)	$50.0	X			17-07-0064
SCL	Various	Various	Various	Hwy. Transportation Operations System/Freeway Performance Initiative Phase 1 & 2	This project will implement traffic control systems based on the Regional Freeway Performance Initiative.	$100.0	X			17-07-001
SCL	Various	Various	Various	Minor Roadway Expansions	This category includes roadway capacity increasing projects (new roadways or widening/extensions of existing roadways) on minor roads throughout Santa Clara County such as Buena Vista Avenue, bridges over US 101 in Gilroy, Blossom Hill Road, Lark Avenue,	$980.0	X			17-07-0005

Co.	Route	Begin Post mile	End Post mile	Title	Description	Cost ($M)	Short-Term (0-4 Years)	Medium-Term (4-10 Years)	Long-Term (10+ Years)	RTP ID
					Pollard Road, Union Avenue, Butterfield Road, San Antonio Road, Charcot Avenue, King Road, Montague Expressway, San Carlos Street, Zanker Road, Coleman Avenue, Autumn Street, Winchester Boulevard, Center Avenue, DeWitt Avenue, Hill Road, Wastonville Road, Mary Avenue, and Wildwood Avenue					
SCL	Various	Various	Various	Santa Clara County Express Lanes - Environmental and Design Phase for Future Segments	This program includes environmental and design phases for future express lane segments in Santa Clara County, including along I-880, US 101 south of Morgan Hill, and for Highway 17	$200.0		X		17-07-0085
SCL	101	49.60	50.32	US 101 Interchanges Improvements: San Antonio Rd. to Charleston Rd./Rengstorff Ave.	Improve southbound U.S. 101 between San Antonio Road to Charleston Road/Rengstorff Avenue.	$22.0		X		17-07-0034
SCL	101	48.59	48.59	US 101/Shoreline Blvd. Interchange Improvements	Realignment of the northbound Shoreline Boulevard off-ramp from US 101 to connect to L' Avenida rather than directly to Shoreline Boulevard.	$15.0		X		17-07-0040
SCL	101	45.68	45.68	SR 237/Mathilda Ave. and US 101/Mathilda Ave. Interchange Improvement	Modify US 101/Mathilda and SR 237/Mathilda interchanges, reducing to one signalized intersection and increasing intersection spacing in the Mathilda Ave./SR 237 interchange area. Project to include ramp improvements, addition of auxiliary lanes, and construction of new ramp configurations.	$17.0	X			17-07-0033
SCL	101	40.69	40.69	US 101 Southbound/Trimble Rd./De La Cruz Blvd./Central Expwy. Interchange Improvements	Improve interchange at U.S. 101 southbound Trimble Road/De la Cruz Boulevard/Central Expressway.	$39.0	X			17-07-0031
SCL	101	39.96	39.96	Double Lane SB US 101 off-ramp to Southbound SR 87	Widen Southbound US 101 freeway connector to Southbound SR 87 to add a second lane and install TOS.	$1.0	X			17-07-0044

Co.	Route	Begin Post mile	End Post mile	Title	Description	Cost ($M)	Short-Term (0-4 Years)	Medium-Term (4-10 Years)	Long-Term (10+ Years)	RTP ID
SCL	101	38.90	38.90	US 101/Zanker Rd./Skyport Dr./Fourth St. Interchange Improvements	Construct a new interchange at U.S. 101/Zanker Road/Skyport Drive/Fourth Street.	$104.0		X		17-07-0023
SCL	101	37.73	37.73	US 101/Old Oakland Rd. Interchange Improvements	Improve interchange at U.S. 101/Old Oakland Road.	$23.0		X		17-07-0039
SCL	101	36.94	36.94	US 101/Mabury Rd./Taylor St. Interchange Construction	Construct interchange at U.S. 101/Mabury Road/Taylor Street.	$57.0	X			17-07-0027
SCL	101	R28.60	R28.60	US 101/Blossom Hill Rd. Interchange Improvements	Widen interchange at U.S. 101/Blossom Hill Road.	$23.0	X			17-07-0038
SCL	101	37.73	37.73	Widen Oakland Road from 4-lanes to 6-lanes between U.S. 101 and Montague Expressway	Provides median island landscaping and operational improvements in roadway corridor between North San Jose and Downtown San Jose area. Widens Oakland Rd. from 4 to 6 lanes.	$11.6		X		17-07-0091
SM SCL	101	SM 6.60	SCL 17.81	US 101 Express Lanes: Whipple Ave. in San Mateo County to Cochrane Rd. in Morgan Hill.	Convert HOV Lanes to EL and add EL in some segments.	$465.0	X			17-07-0075
SM	84	R25.81	R28.19	Improve access to and from the west side of Dumbarton Bridge on Route 84 connecting to U.S. 101 per Gateway 2020 Study - Phased	Improve access to /from the west side of Dumbarton Bridge (Route 84 connecting to U.S. 101) per Gateway 2020 Study (Phased implementation of short term projects. Environmental phase only for long term projects).	$39.0			X	17-06-0016
SM	101	5.39	5.39	Improve U.S. 101/Woodside Road interchange	Modifies the Woodside Road Interchange at US 101.	$171.0	X			17-06-0010
SM	101	0.89	0.89	US 101/University Ave. Interchange Improvements	On University Avenue across US-101, between Woodland Avenue and Donohoe Street; Add bike lanes and sidewalk and modify the NB and SB off-ramps to eliminate pedestrian/bicycle conflicts and improve traffic operations.	$11.0	X			17-06-0025

Co.	Route	Begin Post mile	End Post mile	Title	Description	Cost ($M)	Short-Term (0-4 Years)	Medium-Term (4-10 Years)	Long-Term (10+ Years)	RTP ID
SM	101	0.00	26.11	Modify existing lanes on U.S. 101 to accommodate a managed lane	Modify existing lanes to accommodate an HOV lane from Whipple to San Francisco County Line and/ or an Express Lane from approximately 2 miles south of the Santa Clara County Line to San Francisco County Line. Work may include shoulder modification, ramp modifications, and interchange modifications to accommodate an extra lane. Work will be phased.	$500.0	X			17-06-0007
SM	101	11.89	11.89	Improve operations at U.S. 101 near Route 92 - Phased	US 101 operational improvements near Route 92. Project may have phased construction.	$258.0		X		17-06-0009
SM	101	14.69	14.69	U.S. 101 Interchange at Peninsula Avenue	Construct southbound on and off ramps to US 101 at Peninsula Ave to add on and off ramps from southbound 101.	$89.0		X		17-06-0012
SM	101	8.40	8.40	Route 101/Holly St Interchange Access Improvements	The proposed project would convert the existing full cloverleaf configuration to a partial cloverleaf design by eliminating two of the existing loop off-ramps of the interchange, and realign the diagonal on- and off-ramps into signalized T-intersections with local streets. A new pedestrian and bicycle over crossing will be constructed in the south side of Holly Street Interchange.	$34.0	X			17-06-0017
SM	101	17.94	17.94	Widen Millbrae Avenue between Rollins Road and U.S. 101 southbound on-ramp and resurface intersection of Millbrae Avenue and Rollins Road	Widen Millbrae Avenue between Rollins Road and US101 Southbound On Ramp and resurface the intersection of Millbrae Avenue and Rollins Road.	$11.0		X		17-06-0037
SM	101	R20.63	26.11	Add NB and SB modified auxiliary lanes and/ or implementation of managed lanes on U.S. 101 from I-380 to SF County line	Add northbound and southbound modified auxiliary lanes and/or implementation of managed lanes on U.S. 101 from I-380 to San Francisco County line.	$222.0		X		17-06-0008

Co.	Route	Begin Post mile	End Post mile	Title	Description	Cost ($M)	Short-Term (0-4 Years)	Medium-Term (4-10 Years)	Long-Term (10+ Years)	RTP ID
SM	101	21.47	21.47	US 101 Produce Avenue Interchange	Construct a new interchange on US 101 at Produce Avenue, connecting Utah Avenue on the east side of US 101 to San Mateo Avenue on the west side of US 101. This will allow for reconfiguration of the existing southbound ramps at Produce Ave and Airport Blvd, as well incorporation of the northbound off- and on-ramps at S. Airport Blvd into the interchange design.	$146.0		X		17-06-0011
SM	101	24.84	24.84	Reconstruct U.S. 101/Sierra Point Parkway interchange (includes extension of Lagoon Way to U.S. 101)	Reconstruct a partial interchange and provide improved access to Brisbane, Bayshore Blvd and proposed Brisbane Baylands project. Lagoon Way extension connects to the reconstructed interchange and provides improved access to Brisbane, Daly City, and the pending 600-acre Brisbane Baylands development.	$17.0			X	17-06-0024
SM	101	26.03	26.03	Environmental for 101/Candlestick Interchange	Planning and environmental analysis of the reconstruction of 101/Candlestick Interchange to full all-directional interchange with a single point cross street connection. Project would provide all-direction ramp movements controlled by new signalized intersections at the cross street connections. Interchange would join an improved Harney Way to the east, and would join the Geneva Avenue Extension to the west. Accommodate E/W crossing of planned BRT facility.	$25.0			X	17-06-0021
SM	101	26.03	26.03	Construct a 6-lane arterial from Geneva Avenue/Bayshore Boulevard intersection to U.S. 101/Candlestick Point interchange - Environmental phase	Planning and environmental analysis of a 6-lane arterial from the Geneva Avenue at Bayshore Boulevard to 101/Candlestick Interchange. Grade separation at the Caltrain and Tunnel Ave, Class II bike lanes, on-street parking (travel lanes during peak periods), and sidewalks. Sections will be reserved for an exclusive lane BRT facility that connects to the Bayshore Multimodal Station and provides through service to BART Balboa Station.	$17.0			X	17-06-0038

Co.	Route	Begin Post mile	End Post mile	Title	Description	Cost ($M)	Short-Term (0-4 Years)	Medium-Term (4-10 Years)	Long-Term (10+ Years)	RTP ID
SF	101	0.00	2.92	HOV/HOT Lanes on U.S. 101 and I-280 in San Francisco	Convert an existing mixed traffic lane and/or shoulder/excess ROW in each direction to HOV/Express lanes on US 101 from SF/SM County line to I-280 interchange and on I-280 from US 101 interchange to King Street off ramp to enhance carpool and transit operations during peak periods.	$43.0	X			17-05-0020
Transit Projects										
SCL	Various	Various	Various	Bus Stop Improvements	Create comfortable and dignified transit waiting environments by improving accessibility and amenities at VTA bus stops.	$60.0	X			17-07-0056
SCL	Various	Various	Various	Caltrain Grade Separations	This project includes grade separations of the Caltrain right of way at priority locations throughout Santa Clara County	$800.0	X			17-07-0002
SCL	Various	Various	Various	West San Carlos Light Rail Station (SJ)	In the City of San Jose construct a new light rail station to support new development on West San Carlos Street	$12.1			X	17-07-0003
SCL	Various	Various	Various	Implement Mineta San Jose International Airport APM connector (SJ)	The proposed project will provide transit link to San Jose International Airport from VTA´s Guadalupe Light Rail Transit (LRT) Line, and from Caltrain and future BART in Santa Clara, using Automated People Mover (APM) technology.	$508.0			X	17-07-0063
SCL	Various	Various	Various	SVRT Phase II (San Jose to Santa Clara)	Extension of BART service from San Jose (Berryessa) to Santa Clara	$3,605.0		X		17-07-0012
SCL	Various	Various	Various	New Grade Separations	Project would grade separate light rail tracks from the existing roadway in the following 3 locations: Central Expressway, Lawrence Expressway, and Alum Rock Avenue.	$150.3			X	17-07-0002
SCL	Various	Various	Various	North First Street light rail speed Improvements	This project would improve light rail service and reliability along North First Street. Some of the problems in this area include signal timing issues, slow speeds (maximum speed currently restricted to 35mph), and unscheduled stops. Fencing along this corridor would allow maximum speeds to increase to 45 mph, and combined with improvements to signal timing.	$9.0	X			17-07-0060

Co.	Route	Begin Post mile	End Post mile	Title	Description	Cost ($M)	Short-Term (0-4 Years)	Medium-Term (4-10 Years)	Long-Term (10+ Years)	RTP ID
SCL	Various	Various	Various	Extend Capitol Expressway light rail to Eastridge Transit Center - Phase II	Provides light rail extension in the East Valley. Extends the Capitol Avenue light rail line 2.6 miles from the existing Alum Rock Transit Center to a rebuilt Eastridge Transit Center. Includes the removal of HOV lanes on Capitol Expressway between Capitol Avenue and Tully Road in San Jose.	$276.0		X		17-07-0061
SCL	Various	Various	Various	Implement El Camino Rapid Transit Project	Implement Rapid line 522 improvements in the El Camino Real/The Alameda corridor including: dedicated guideways, signal prioritization, low-floor boarding, ticket vending machines, premium stations, real-time information, and specialized vehicles.	$230.0	X			17-07-0013
SCL	Various	Various	Various	Stevens Creek Bus Rapid Transit	Implement Rapid Transit improvements in the Stevens Creek corridor including: dedicated guideways, signal prioritization, low-floor boarding, ticket vending machines, premium BRT stations, real-time information, and specialized vehicles.	$254.0		X		17-07-0059
SM	Various	Various	Various	Environmental Clearance and Design of the Redwood City Ferry Terminal and Service	Planning and environmental analysis of the construction of a new ferry terminal, purchase of 3 new high-speed ferry vessels, and operation of new ferry service between Redwood City and San Francisco.	$8.0		X		17-06-0030
SM	Various	Various	Various	Implement Redwood City Street Car - Planning Phase	Planning and environmental analysis of Redwood City Street Car Construction and Implementation	$1.0			X	17-06-0031
SM	82	0.00	24.85	Implement supporting infrastructure and Automated Transit Signal Priority to support SamTrans express rapid bus service along El Camino Real	This project will institute necessary infrastructure and Automated Transit Signal Priority necessary to accommodate express rapid bus service along the length of El Camino Real from Palo Alto to Daly City.	$3.9	X			17--06-0027

Co.	Route	Begin Post mile	End Post mile	Title	Description	Cost ($M)	Short-Term (0-4 Years)	Medium-Term (4-10 Years)	Long-Term (10+ Years)	RTP ID
SM	82	0.00	24.85	Add new rolling stock and infrastructure to support SamTrans bus rapid transit along El Camino Real- Phase	This project will institute new rolling stock and infrastructure necessary to accommodate BRT along El Camino Real	$228.0	X	X		17-06-0029
SM	Various	Various	Various	Implement incentive programs to support transit-oriented development	Implement an incentive programs to support transit-oriented developments in San Mateo County.	$106.0	X	X		17-06-0026
SM	Various	Various	Various	Grade Separations	This project includes grade separations of the Caltrain right of way at approximately 2 to 3 high priority locations in San Mateo County, including 25th Avenue. This project is based on San Mateo County's Measure A grade separation category.	$265.0	X	X		17-06-0039
SM	Various	Various	Various	Make incremental increase in SamTrans paratransit service - Phase	Expansion of curb-to-curb paratransit fleet and service for eligible users, compliant with ADA requirements, based on projected future demand.	$377.0	X	X		17-06-0028
SM	Various	Various	Various	Introduction of Express Bus Network Serving US 101	This project would re-introduce a robust network of express buses on US-101 serving San Mateo County, San Francisco County, and Santa Clara County. The express buses would be operated by SamTrans, potentially in conjunction with a managed lane in San Mateo County and managed lanes in other jurisdictions.	$82.0	X			17-10-0033
SF	Various	Various	Various	22 Fillmore Transit Priority Project	As part of Muni Forward, the SFMTA is planning transit priority and pedestrian safety improvements for the 22 Fillmore route along 16th Street, including transit-only lanes, transit bulbs and islands, new traffic signals, and several pedestrian safety upgrades. This project will correlate with several infrastructure upgrades along 16th Street, including repaving and utility work, and will also include extending the overhead contact system (OCS) from Kansas	$67.1	X			

Co.	Route	Begin Post mile	End Post mile	Title	Description	Cost ($M)	Short-Term (0-4 Years)	Medium-Term (4-10 Years)	Long-Term (10+ Years)	RTP ID
					Street to Third Street to allow for zero-emission transit service into Mission Bay.					
SF	Various	Various	Various	Candlestick Point / Hunters Point Shipyard Transit Operating Plan	Re-alignment of transit service in Southeast San Francisco to accommodate development and projected growth in the Candlestick Point/Hunters Point development area, including the introduction of two new express bus routes using the 101 and 280 freeways.	$168.0		X		
SF	Various	Various	Various	San Bruno Avenue Multimodal Improvement Project	The San Bruno Ave Multimodal Improvement Project includes pedestrian safety, transit priority and parking management proposals that will make the street safer for people walking, increase the reliability of Muni, and address parking availability in the neighborhood. This project has been approved by the SFMTA Board of Directors in October 2016.	$4.1	X			
SF	Various	Various	Various	Establish new ferry terminal at Mission Bay 16th Street	Establish New Ferry terminal to serve Mission Bay and Central Waterfront neighborhoods	$17.0	X			17-05-0019
SF	Various	Various	Various	Geneva-Harney Bus Rapid Transit	Provides exclusive bus lanes, transit signal priority, and high-quality stations along Geneva Avenue (from Santos St to Executive Park Blvd), Harney Way, and Crisp Avenue, and terminating at the Hunters Point Shipyard Center. The project includes pedestrian and bicycle improvements in support of Vision Zero and connects with Muni Forward transit priority improvements west of Santos Street. This is the near-term alternative that does not rely on the full extension of Harney Way across US 101.	$256.0		X		17-05-0032

Co.	Route	Begin Post mile	End Post mile	Title	Description	Cost ($M)	Short-Term (0-4 Years)	Medium-Term (4-10 Years)	Long-Term (10+ Years)	RTP ID
SF	Various	Various	Various	Historic Streetcar Extension - Fort Mason to 4th & King	The project would extend historic streetcar service by extending either the E-line or the F-line service from Fisherman's Wharf to Fort Mason, using the historic railway tunnel between Van Ness Ave. and the Fort Mason Center. The project will seek non-transit specific funds and will seek to improve the historic streetcar operation as an attractive service for tourists and visitors.	$87.0		X		17-05-0042
SF	Various	Various	Various	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 including but not limited to projects such as TDM program implementation, parking management, local area shuttle and paratransit services	$93.0	X			17-05-0002
SF	Various	Various	Various	Arena Transit Capacity Improvements	Identifies transit improvements needed to accommodate growth in Mission Bay. Improvements might include track crossovers to allow for trains to be staged; a 6-inch raised area along existing tracks; a platform extension to accommodate crowds; other trackway modifications; and a traction power study to ensure that the power grid can accommodate a large number of idling vehicles.	$137.0	X			17-05-0034
SF	Various	Various	Various	Bayshore Station Multimodal Planning and Design	Planning, Preliminary Engineering, and Environmental Review to re-locate the Bayshore Caltrain station and potentially extend the T-Line to the station. The project would also include inter-modal facilities and additional supporting structures and utilities.	$13.0		X		17-05-0026
SF	Various	Various	Various	Core Capacity Implementation - Planning and Conceptual Engineering	Advance planning and evaluation of recommendations that emerge from the Core Capacity Transit Study. Examples of projects under consideration include HOV lanes on the Bay Bridge for buses and carpools; BART/Muni/Caltrain tunnel turnbacks, crossover	$335.0		X		17-05-0017

Co.	Route	Begin Post mile	End Post mile	Title	Description	Cost ($M)	Short-Term (0-4 Years)	Medium-Term (4-10 Years)	Long-Term (10+ Years)	RTP ID
					tracks, grade separations, or other operational improvements; and a second transbay transit crossing.					
SF	Various	Various	Various	County Safety, Security and Other	Projects in this category address safety and security needs including Vision Zero improvements at ramps, local road safety and security, India Basin roadway transportation improvements, and transit safety and security	$41.0	X			17-05-0003
SF	Various	Various	Various	Rail Capacity Long Term Planning and Conceptual Design - All	Rail capacity long term planning and conceptual design for Muni, BART, and Caltrain. Planning and conceptual engineering phase for study of major corridor and infrastructure investments along existing and potential expansion rail corridors that either expand the system or provide significant increases in operating capacity to the existing rail system.	$130.0		X		17-05-0015
SF	Various	Various	Various	Regional/Local Express Bus to Support Express Lanes in SF	A 5-year regional/local express bus pilot to provide service to/from downtown San Francisco to/from San Francisco neighborhoods, Marin, Contra Costa, Alameda, San Mateo and Santa Clara counties to complement other freeway corridor management strategies. Some service to be funded with HOT lane revenues. See HOV/HOT Lanes on U.S. 101 and I-280 in San Francisco project. Includes vehicles.	$82.0	X			17-05-0036
SF	Various	Various	Various	San Francisco Late Night Transportation Improvements	New routes and increased frequency for all-night regional and local bus service, including Muni, AC Transit, Golden Gate Transit, and SamTrans routes. This is a pilot for 5 years.	$52.0	X			17-05-0011
SF	Various	Various	Various	Southeast San Francisco Caltrain Station - Environmental	Planning and environmental analysis of Caltrain infill station to replace Paul Ave Station in Southeast San Francisco (e.g. Oakdale).	$11.0	X			17-05-0028
SF	Various	Various	Various	Downtown Value Pricing/Incentives - Pilot, Transit Service,	A set of street improvements to support transit operations and cycling and pedestrian safety and comfort to support the anticipated mode	$876.0		X		17-05-0029

Co.	Route	Begin Post mile	End Post mile	Title	Description	Cost ($M)	Short-Term (0-4 Years)	Medium-Term (4-10 Years)	Long-Term (10+ Years)	RTP ID
				Supportive Infrastructure	shift due to the implementation of congestion pricing.					
SF	Various	Various	Various	Southeast Waterfront Transportation Improvements - Phase 1	Create a 5 mile multi-modal corridor of streets, transit facilities, pedestrian paths, and dedicated bicycle lanes to link the Candlestick/Hunters Point Shipyard project area to BART, T-Third light rail, Caltrain, local bus lines and future ferry service. A BRT system (included in a RTPID 17-05-0032) would use exclusive transit right-of-way, station and shelter facilities, and transit signal priority infrastructure. This project also includes express bus and enhances transit service between the Southeast Waterfront and downtown San Francisco.	$406.0		X		17-05-0031
SF	Various	Various	Various	Muni Forward (Transit Effectiveness Project)	Includes transit priority improvements along Rapid and High Frequency transit corridors, service increases, transfer and terminal investments, overhead wire changes, and street improvements in support of Vision Zero.	$612.0	X	X		17-05-0014
SF	Various	Various	Various	Caltrain/HSR Downtown San Francisco Extension	The Downtown Rail Extension (DTX) will extend Caltrain commuter rail from its current terminus at Fourth and King streets and deliver the California High-Speed Rail Authority's future high-speed service to the new Transit Center. The 1.95-mile rail extension will be constructed principally below grade underneath Townsend and Second streets. The design includes an underground station at Fourth and Townsend streets, utility relocations, rail systems work, and structures for emergency exit, ventilation at six locations along the alignment, and an underground pedestrian bridge connecting the Transbay Terminal to the Embarcadero BART station. Cost includes operating expenses - capital cost is $3.999 billion	$4,250.0		X		17-10-0038
SF	Various	Various	Various	Implement Transbay Transit Center/Caltrain	The project has 3 components: (1) new Transbay Transit Center built on the site of the former	$2,259.0	X	X		17-10-0039

Co.	Route	Begin Post mile	End Post mile	Title	Description	Cost ($M)	Short-Term (0-4 Years)	Medium-Term (4-10 Years)	Long-Term (10+ Years)	RTP ID
				Downtown Extension (Phase 1 - Transbay Transit Center)	Transbay Terminal in downtown San Francisco serving 11 transportation systems; (2) extension of Caltrain commuter rail service from its current San Francisco terminus at 4th & King Streets to a new underground terminus; and (3) establishment of a Redevelopment Area Plan with related development projects.					
SF	Various	Various	Various	Expand SFMTA Transit Fleet	This project entails future expansion of the SFMTA transit fleet and needed facilities to house and maintain transit vehicles. The purpose is to meet projected future transit demand, as indicated in the SFMTA Transit Fleet Plan. It will facilitate the future provision of additional service through the procurement of transit vehicles as well as the development of needed modern transit facilities. This also includes the expansion vehicles for Geary BRT (RTPID 17-05-0021) and does not include expansion vehicles for Central Subway, which are in RTPITD 17-05-0041.	$1,295.0	X			17-05-0013
SF	Various	Various	Various	SFgo Integrated Transportation Management System	SFgo is San Francisco's Citywide ITS program. It identifies signalized and non-signalized intersections located along arterials and the Muni transit system and prioritizes them for ITS upgrades, such as controllers, cabinets, transit signal priority, fiber optic or wireless communications, traffic cameras, and variable message signs. Also improves arterial safety and pedestrian safety.	$89.0	X			17-05-0012
SF	Various	Various	Various	Transit Preservation/ Rehabilitation	This project provides additional funding to transit capital preservation and rehabilitation beyond what is included in the regional transit capital project (RTPID 17-10-0026)	$1,871.0	X			17-05-0007
Var	Various	Various	Various	California HSR in the Bay Area	This project implements the segment of California High Speed Rail that is in the Bay Area.	$8,489.0		X		17-10-0007

Co.	Route	Begin Post mile	End Post mile	Title	Description	Cost ($M)	Short-Term (0-4 Years)	Medium-Term (4-10 Years)	Long-Term (10+ Years)	RTP ID
Var	Various	Various	Various	Caltrain Electrification Phase 1 + CBOSS	The Peninsula Corridor Electrification Project (PCEP) includes the electrification of the Caltrain corridor between San Francisco and San Jose, the procurement of new, Electric Multiple Unit rolling stock, and an increase in the Caltrain service levels. This project also includes CBOSS, which is the Communications Based Overlay Signal System (CBOSS) Positive Train Control necessary to monitor and control train movements as well as increase safety.	$2,360.0	X			17-10-0008
Var.	Various	Various	Various	Caltrain Station and Service Enhancements (Cal Mod 2.0)	Projects to improve Caltrain service, system performance and stations including full EMU conversion, longer vehicles, longer platforms, level boarding, parking improvements, bike facilities, transit connectivity, other station enhancements and track reconfigurations.	$722.0		X		17-07-0065
Multi-County Projects/Programs										
Var.	Various	Various	Various	BART Transbay Core Capacity Project	The Transbay Corridor Core Capacity Project is a multi-pronged effort to address capacity issues in the Transbay corridor and is in coordination with the BART Metro Program project. The project elements are: *Communication-based train control (CBTC) system to safely enable closer headways and allow BART to operate more frequent service (12 minute frequencies); *Expansion of the rail car fleet by 306 vehicles to add cars to existing trains and operate more frequent trains; *Added traction power substations to allow more frequent service; *Expansion of the Hayward Maintenance Complex (HMC) to provide storage and maintenance capability for the expanded fleet;	$3,132.0				17-10-0006

Co.	Route	Begin Post mile	End Post mile	Title	Description	Cost ($M)	Short-Term (0-4 Years)	Medium-Term (4-10 Years)	Long-Term (10+ Years)	RTP ID
					*Other (Unallocated contingency) Financing cost is included in RTPID 17-10-0016.					
Var.	Various	Various	Various	Bay Area Forward	This program includes a variety of operational and multimodal improvements, including: active traffic management - upgrades to all existing ramp meters to adaptive, implementing hard shoulder running lanes, contra-flow lanes, queue warning, and ramp modifications; arterial operations - implementation of traditional time-of-day signal timing coordination, adaptive traffic signal control systems, transit signal priority, real-time traffic monitoring devices, ped/bike detection, queue-jump lanes, etc; connected vehicles - pilot deployments of vehicle-to-infrastructure (V2I) strategies; Managed Lanes Implementation Plan - pilot express bus service for routes not currently served by operators; expands park-and-ride facilities throughout the region; and supports pilot deployment of shared-mobility solutions.	$995.0				17-10-0033

* These projects are included in VTA's *Envision 2045* and do not have RTP ID's

Bicycle and Pedestrian Projects

Table 57 lists recommended bicycle and pedestrian projects within the US 101 South Corridor. As mentioned earlier in section 5.4 Bicycle and Pedestrian Facilities, bicycle projects are based on projects from existing countywide bicycle plans (designated as Planned) as well as the needs assessment that was conducted as part of the District 4 Bike Plan development (also designated as Planned). For pedestrian facilities, the projects are from the current countywide bicycle and pedestrian plans as well as data from the geo-photographic survey that was conducted by District 4 Planning (designated as Proposed). With a few exceptions, 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. An inventory of intersections, interchanges, and over and under crossings along US 101 and I-280 within the Corridor limits are included in Appendix A.3.

Table 57 *Bicycle and Pedestrian Improvement Projects*
(not in priority order)

County	Route	Post Mile	Location	Project Description	Mode	Planned or Proposed*
SCL	US 101	R5.28	Luchessa Avenue	Pedestrian improvements (narrow sidewalk)	Ped	Proposed
SCL	US 101	R6.29	Old Gilroy Street	ABC	Bike/Ped	Planned
SCL	US 101	R6.561/R7.533	Leavesley to Gilman	Bike lanes	Bike	Planned
SCL	US 101	R7.07	IOOF Avenue	Bike/Ped Bridge	Bike/Ped	Planned
SCL	US 101	R8.28	Las Animas Avenue	Bike/Ped Bridge	Bike/Ped	Proposed
SCL	US 101	R9.13/M10.277	Buena Vista to Leavesley	Bike lanes	Bike	Planned
SCL	US 101	R9.13/R10.284	Masten to Buena Vista	Bike lanes	Bike	Planned
SCL	US 101	R10.284/R11.158	Church to Masten	Bike lanes	Bike	Planned
SCL	US 101	R11.158/R12.461	San Martin to Church	Bike lanes	Bike	Planned
SCL	US 101	R12.461/R13.747	Middle to San Martin	Bike lanes	Bike	Planned
SCL	US 101	R13.747/R15.069	Tennant to Middle	Bike lanes	Bike	Planned
SCL	US 101	R15.068/R15.996	Dunne to Tennant	Bike lanes	Bike	Planned
SCL	US 101	R16.778/R17.833	Cochrane to Main	Bike lanes	Bike	Planned
SCL	US 101	R21.274	Coyote Creek Golf Drive	Pedestrian improvements (no sidewalk)	Ped	Proposed
SCL	US 101	R25.312	Metcalf Road	Pedestrian improvements (narrow sidewalk)	Ped	Proposed
SCL	US 101	R25.314/27.024	Bernal to Metcalf	Bike lanes	Bike	Planned
SCL	US 101	R27.024	Blossom Hill/Silver Creek Road to Bernal	Bike lanes	Bike	Planned
SCL	US 101	R28.607/29.73	Coyote Creek Road to Blossom Hill/Silver Creek Valley Rd	Bike lanes/ Pedestrian improvements	Bike/Ped	Planned
SCL	US 101	29.731	Coyote Road	Pedestrian improvements (narrow sidewalk)	Ped	Proposed
SCL	US 101	29.731	Coyote Road	Pedestrian improvements (narrow sidewalk)	Ped	Proposed
SCL	US 101	30.096	Hellyer Avenue	Pedestrian improvements (narrow sidewalk)	Ped	Planned
SCL	US 101	31.697/33.029	Tully to Capitol Expressway	Bike lanes	Bike	Planned
SCL	US 101	31.764/32.527	Freni Court to North of East Capitol Expressway	Bike lanes	Bike	Proposed
SCL	US 101	33.038/34.546	Story to Tully	Bike lanes	Bike	Planned
SCL	US 101	33.812	Havana Drive/Holly Hill Drive	Bike/ped bridge	Bike/Ped	Planned
SCL	US 101	34.279/R36.285	McKee Road to Story Road	Bike lanes	Bike	Proposed

County	Route	Post Mile	Location	Project Description	Mode	Planned or Proposed*
SCL	US 101	37.34	Mabury Road to North Bayshore Road West	Minor interchange improvements (signage and striping)	Bike	Planned
SCL	US 101	37.513/38.259	Nimitz Freeway to East Hedding Street	Bike lanes	Bike	Proposed
SCL	US 101	38.095/39.303	North First to North Tenth	Bike lanes	Bike	Planned
SCL	US 101	38.787/39.753	East of Guadalupe Freeway to West of Nimitz Freeway	Bike lanes	Bike	Proposed
SCL	US 101	39.44	Airport Parkway	Minor interchange improvements (signage and striping)	Bike	Planned
SCL	US 101	41.083	Lafayette Street	Overcrossing	Bike/Ped	Planned
SCL	US 101	40.015/41.255	Basset Street to Guadalupe Freeway	Bike lanes	Bike	Proposed
SCL	US 101	40.70	de la Cruz Boulevard	Interchange reconstruction including Class IV cycle track	Bike	Planned
SCL	US 101	41.07/41.98	San Tomas/Montague Expressway to Lafayette	Bike lanes	Bike	Planned
SCL	US 101	41.759/42.273	Interchange at Montague Expressway	Bike lanes/ramp realignment/signal-controlled	Bike	Proposed
SCL	US 101	42.506/43.771	Lawrence Expressway to Bowers Avenue	Bike lanes	Bike	Proposed
SCL	US 101	44.83	North Fair Oaks Avenue	Pedestrian improvements (no sidewalk)	Ped	Proposed
SCL	US 101	44.84	Ahwanee	East Channel Trail ABC	Bike	Planned
SCL	US 101	45.682/47.034	Ellis to Mathilda	Bike lanes	Bike	Planned
SCL	US 101	46.00	Mary Avenue	ABC	Bike/Ped	Planned
SCL	US 101	46.506/46.759	South of Moffett Field	Bike lanes	Bike	Proposed
SCL	US 101	48.599/49.615	Rengstorff/Amphitheater to Shoreline	Bike lanes	Bike	Planned
SCL	US 101	48.599	Shoreline Boulevard	New bridge with fully separated path for pedestrians and bicyclists	Bike/Ped	Planned
SCL	US 101	50.324	San Antonio Street	Overcrossing	Bike/Ped	Planned
SCL	US 101	50.325/51.998	Oregon Expressway Crossing to San Antonio Road	Bike lanes	Bike	Planned
SCL	US 101	50.66	Crossing between San Antonio and Oregon Expressway	Bike/Ped crossing	Bike/Ped	Planned

County	Route	Post Mile	Location	Project Description	Mode	Planned or Proposed*
SCL	US 101	50.888	Matadero Creek Trail	New undercrossing	Bike/Ped	Planned
SCL	US 101	51.391	Adobe Creek Overcrossing	New bike/ped overcrossing	Bike/Ped	Planned
SCL	West Branch Llagas Creek Trail		West of US 101 between Leavesley Road and 6th Street	Multi-use trail	Bike/Ped	Planned
SCL	Diana Avenue		Butterfield Boulevard to US 101	Bike lanes	Bike	Planned
SCL	Branham Lane		Camden Avenue to Coyote Creek Trail	Bike lanes	Bike	Partially Completed
SCL	Coyote Creek Trail		Old Oakland Road to Watson Park	Paved trail	Bike/Ped	Planned
SCL	Coyote Creek Trail		Watson Park to Williams Street Park	Paved trail	Bike/Ped	Planned
SCL	Lower Silver Creek Trail		Coyote Creek Trail to Berryessa B Capitol Light Rail	Trail	Bike/Ped	Planned
SCL	Calabazas Creek Trail		SR 237 to Lochinar Avenue	Trail	Bike/Ped	Partially Completed
SCL	Lafayette Street		Agnew Road to Reed Street	Bike lanes	Bike	Planned
SCL	Fair Oaks Avenue		Old San Francisco Road to Ahwanee Avenue	Bike lanes	Bike	Planned
SCL	Mathilda Avenue		US 101 to El Camino Real	Bike lanes	Bike	Partially Completed
SCL/SM	US 101	SCL 52.164/ SM 0.866	University to Embarcadero	Bike lanes	Bike	Planned
SM	Clarke Avenue	0.457	Clarke Avenue at US 101	Overcrossing	Bike/Ped	Planned
SM	E. Bayshore Road	0.73	E. Bayshore Road at US 101	Overcrossing	Bike/Ped	Planned
SM	University Avenue	0.886	University Avenue at US 101	Overcrossing (existing facility)	Bike/Ped	Planned
SM	US 101	0.891	University Avenue	Pedestrian improvements (no sidewalk)	Ped	Proposed
SM	US 101	1.954/1.704	Interchange at Willow Road	Bike lanes	Bike	Proposed
SM	Carlton Avenue	2.003	Carlton Avenue at US 101	Overcrossing	Bike/Ped	Planned
SM	US 101	3.595	US 101 and Marsh Road	Intersection improvements	Bike/Ped	Proposed
SM	Whipple Road	4.813	Whipple Road at US 101	Overcrossing	Bike/Ped	Planned
SM	US 101	5.003	US 101 and Willow Road	Intersection improvements	Bike/Ped	Proposed
SM	SR 114/US 101 interchange	5.002	North side overpass to south side overpass	Class II/III bikeway	Bike	Planned
SM	US 101	5.186/6.713	East Bayshore Road to Charter Street	Bike lanes	Bike	Proposed
SM	US 101	5.386	US 101 and SR 84	Interchange improvement	Bike/Ped	Proposed
SM	US 101	5.386	Woodside Road	Bike lanes	Bike	Planned
SM	US 101	6.572	Holly Street	Interchange improvement	Bike/Ped	Planned

County	Route	Post Mile	Location	Project Description	Mode	Planned or Proposed*
SM	Holly Street	6.572	Holly Street at US 101	Overcrossing	Bike/Ped	Planned
SM	US 101	6.626	Whipple Avenue	Pedestrian improvements (narrow sidewalk)	Ped	Proposed
SM	US 101	8.213/8.703	North of Holly Street to South of Holly Street	Bike lanes and pedestrian improvements (narrow sidewalk)	Bike/Ped	Proposed
SM	US 101	10.955/11.458	Claudia Avenue to La Selva Circle	Bike lanes	Bike	Proposed
SM	E. Hillsdale Boulevard	11.148	E. Hillsdale Boulevard at US 101	Overcrossing	Bike/Ped	Planned
SM	US 101	11.612/11.991	Adams Street to South of SR 92	Bike lanes	Bike	Proposed
SM	US 101	11.89	US 101 and SR 92	Interchange improvement	Bike/Ped	Proposed
SM	Lodi Avenue	12.517	Lodi Avenue at US 101	Overcrossing	Bike/Ped	Planned
SM	E. 3rd/E. 4th Street	13.463	E. 3rd/E. 4th Street at US 101	Interchange improvement	Bike	Planned
SM	US 101	16.611	Broadway	Interchange improvement	Bike/Ped	Planned
SM	US 101	17.94	US 101/Millbrae Avenue	Bicycle/Pedestrian overcrossing linking the Bay Trail to the Millbrae BART/Caltrain transit station.	Bike/Ped	Planned
SM	San Bruno Avenue	R20.39	San Bruno Avenue at US 101	Overcrossing	Bike/Ped	Planned
SM	US 101	21.702	South Airport Boulevard	Pedestrian improvements (narrow sidewalk)	Ped	Proposed
SM	US 101	21.706/21.942	East Grand Avenue to South Airport Boulevard	Bike lanes	Bike	Proposed
SM	Grand Avenue	22.024	Grand Avenue at US 101	Interchange improvement	Bike	Planned
SM	Oyster Point Boulevard	22.723	US 101 at Oyster Point Boulevard	Interchange improvement	Bike	Planned
SM	Airport Boulevard/Bayshore Boulevard	23.04	Airport Boulevard/Bayshore Boulevard at US 101	Overcrossing	Bike/Ped	Planned
SM	US 101 bike path	23.653/26.028	Beatty Road to Sierra Point	Class I bikeway	Bike	Planned
SM	US 101	23.672	Sierra Point Parkway	Pedestrian improvements (no sidewalk)	Ped	Proposed
SM	US 101		Overcrossing located 300' N. of Donahoe Street to Woodland Avenue	Class II bikeway	Bike/Ped	Planned
SM	Marsh Road		Bay Road to US 101	Class II/III bikeway	Bike	Planned
SM	Maple Street		El Camino Real to Blomquist Street	Class II/III bikeway	Bike	Planned

County	Route	Post Mile	Location	Project Description	Mode	Planned or Proposed*
SM	Woodside Road		El Camino Real to Seaport Center	Class II bikeway	Bike	Planned
SM	Woodland		Menlo Park Line to US 101 overcrossing	Class II/III bikeway	Bike	Planned
SM	Marsh Road		US 101 to Haven Avenue	Class III bikeway	Bike	Planned
SM	Newbridge Street		US 101 overcrossing to Bay Road	Class II bikeway	Bike	Planned
SM	Stein Am Rhein Ct		Seaport Boulevard to US 101	Class II/III bikeway	Bike	Planned
SM	Bay Road		Windermere Avenue to US 101	Class III bikeway	Bike	Planned
SM	Ringwood Avenue		Bay Road to US 101 overcrossing	Class II/III bikeway	Bike	Planned
SM	Oak Grove/Winchester		Anza Boulevard to Farringdon Lane	Class II/III bikeway	Bike	Planned
SM	Old Bayshore Boulevard		Coast Guard Road to Burlingame Line	Class II/III bikeway	Bike	Planned
SM	East Hillsdale Boulevard		Foster City Line to Norfolk Street	Class II bikeway	Bike	Planned
SM	Peninsula Avenue		N. Delaware Street to Coyote Point Drive	Class II/III bikeway	Bike	Planned
SM	Ralston Avenue		Belmont Line to Marine Parkway	Class II/III bikeway	Bike	Planned
SM	Chestnut to Seaport undercrossing		Chestnut Street to Stein Am Rhein Court	Class I bikeway	Bike	Planned
SM	E. Grand Avenue		Airport Boulevard to Gateway Boulevard	Class II bikeway	Bike	Planned
SM	US 101 bike path		Oyster Point Boulevard	Bike path	Bike	Planned
SM	Airport Boulevard/US 101/I-380 overcrossing		South San Francisco to Airport Boulevard	Class I bikeway	Bike	Planned
SF	US 101	0.178	Blanken Avenue	Pedestrian improvements (narrow sidewalk)	Ped	Proposed
SF	US 101	0.37	Alana Way	Pedestrian improvements (no sidewalk)	Ped	Proposed
SF	US 101	0.847/1.357	Wayland Street to Ordway Street	Bike lanes	Bike	Proposed
SF	US 101	1.598/2.338	Cortland Avenue to Thornton Avenue	Bike lanes	Bike	Proposed

County	Route	Post Mile	Location	Project Description	Mode	Planned or Proposed*
SF	US 101 and I-280	1.97 (US 101) R4.32R (I-280)	Bayshore Boulevard	Minor interchange improvements (signage and striping)	Bike	Planned
SF	US 101	2.582/3.339	23rd Street to Faith Street	Bike lanes	Bike	Proposed
SF	US 101	3.851/ M5.45	Market/Octavia to 19th Street	Bike lanes	Bike	Proposed
SF	Cesar Chavez Street	3.01	I-280 to US 101	Bike lanes and pedestrian improvements	Bike/Ped	Planned
SF	Cesar Chavez Street/26th Street	3.062	Sanchez Street to US 101	Bike lanes	Bike	Planned
SF	US 101	T4.51R	Mission Street	Minor interchange improvements (signage and striping)	Bike	Planned
SF	I-280	R3.681/R4.693L	Ellsworth Street to Revere Avenue	Bike lanes	Bike	Proposed
SF	I-280	R5.415R/R6.115	Evans Avenue to 22nd Street	Bike lanes	Bike	Proposed
SF	I-280	R5.44L/R5.80L	Napoleon Street to 25th Street	Minor interchange improvements (signage and striping)	Bike	Planned
SF	I-280	R6.39/6.68	20th Street to Mariposa Street	Minor interchange improvements (signage and striping)	Bike	Planned
SF	I-280	T7.296	I-280 and 6th Street	Intersection improvements	Bike/Ped	Proposed
SF	Division Street		9th Street to 11th Street	Bike lanes	Bike	Planned
SF	Market Street		17th Street to Octavia Boulevard	Bike lanes	Bike	Planned
SF	Market Street		Octavia Boulevard to Van Ness Avenue	Bike lanes	Bike	Planned
SF	23rd Street		Kansas Street to Potrero Avenue	Bike lanes	Bike	Planned
SF	Alemany Boulevard		Bayshore Boulevard to Rousseau Street	Bike lanes	Bike	Planned
SF	Bayshore Boulevard		Cesar Chavez Street to Silver Avenue	Bike lanes	Bike	Planned
SF	Potrero Avenue and Bayshore Boulevard		25th Street to Cesar Chavez Street	Bike lanes	Bike	Planned

* Planned: Projects identified in current countywide bicycle and pedestrian plans
Proposed: Newly proposed bicycle projects from the District 4 Bike Plan needs assessment and pedestrian projects from the high-level geo-photographic survey

State Highway Operations and Protection Program

The State Highway Operations and Protection Program (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, with generally no 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, traffic operations systems/traffic management systems, freight improvements and system resiliency and adaptation to climate change.

In accordance with Streets and Highways Code Section 164.6, Caltrans also prepares a ten-year State rehabilitation plan every two years that identifies the rehabilitation and reconstruction needs of all highways and bridges on the State Highway System, also known as the Ten-Year SHOPP Plan. For the 2017 cycle, a State Highway System Management Plan (SHSMP) has been developed as a new integrated management plan that fulfills the Streets and Highway Code requirements for the Ten-Year SHOPP Plan and incorporates the Five-Year Maintenance Plan. The SHSMP also helps fulfill the requirement for Caltrans to develop a robust Asset Management Plan, as outlined in Senate Bill 486. Among other changes, the SHSMP integrates the maintenance, rehabilitation and operation into a single management plan, introduces new national performance measures for pavement and bridges as required by federal law and presents performance targets approved under provisions of Senate Bill 486.[57] Table 58 lists projects in the adopted 2016 SHOPP program and the draft 2018 SHOPP Program as well as other planned projects for future SHOPP cycles.

The SHOPP project list includes projects to implement ramp metering and other TOS elements in the State Highway System. In addition, Caltrans also prepares a District Ramp Metering Development Plan (RMDP) that contains a list of ramp metering locations currently in operation or planned for operation in the next ten years, as discussed in Section 5.5 Transportation Systems Management and Operations. The RMDP is consistent with the Ten-Year SHOPP Plan and provides more detailed location information about the planned ramp metering projects. These projects are included in Table 55, too.

[57] http://www.catc.ca.gov/programs/SHOPP/2017_State_Highway_System_Management_Plan.pdf

Table 58 *US 101 South Future SHOPP and Ramp Metering Projects*

County	Route	Begin Postmile	End Postmile	SHOPP ID	EA	Title	Description	Source*
SCL	101	0.00	16.00	13684	4J920	Roadway rehabilitation	Roadway rehabilitation (2R) from San Benito County Line to Dunn Avenue	2017 10-Year SHOPP Plan
SCL	101	0.80	0.80	17230	4J030	Storm damage permanent restoration	Construct RSP, drainage system, and injection grouting at abutment washout and wingwall rotation	Draft 2018 SHOPP
SCL	101	R0.81	R0.90	20730	4K130	Major Damage	Sargent BOH (Br No 37-006R)- Bridge Hit and Baluster Rail Replacement	2017 10-Year SHOPP Plan
SCL	101	2.96	2.96			Implement ramp meters at SB on-ramp	Rte 25	Draft 2017 Ramp Metering Development Plan
SCL	101	3.08	3.38	20580		Mobility	SCL-101-PM3.08/3.38 & SCL-025-PM2.35/2.56 - Improve connector for southbound US-101 off-ramp to eastbound SR-25 at the US-101/SR-25 interchange	2017 10-Year SHOPP Plan
SCL	101	3.23	3.23			Implement ramp meters at NB on-ramp	Rte 25	Draft 2017 Ramp Metering Development Plan
SCL	101	R13.87	R13.88		0P990	Bridge preservation	Little Lagas Cr No. 37-0392- Bridge health; Bridge rehabilitation	2017 10-Year SHOPP Plan
SCL	152	M10.00	R35.10	14073	2K800	Reduce the frequency and duration of highway workers' exposure to traffic	Roadside safety improvements; Install vegetation control under guard rail and maintenance vehicle pullouts.	Draft 2018 SHOPP
SCL	152	7.60	M10.20	16826	2K750		In Gilroy, from 0.3 miles west of Santa Teresa Boulevard to Route 101. Rehabilitate pavement.	Draft 2018 SHOPP
SCL	101	0.00	17.50	20375		Mobility	Install TOS Elements and Fiber Communication on SCL 101 (PM 0.0/17.5), between SCL/SBT County Line and Cochrane Road.	2017 10-Year SHOPP Plan
SCL	101	R9.00	R16.80	15659	2J890		In and near Morgan Hill, from south of Masten Avenue to East Main Avenue. Install edgeline and shoulder rumble strips, concrete barrier and enhanced wet-night visibility striping.	Draft 2018 SHOPP
SCL	101	Various	Various		0J560		In various cities, on Routes 101 and 237 at various locations. Bridge rail upgrade at 8 locations. (G13 Contingency Project)	Draft 2018 SHOPP

County	Route	Begin Postmile	End Postmile	SHOPP ID	EA	Title	Description	Source*
SCL	Various	Various	Various	16743	2J950	Collision Severity Reduction	Clean up roadside environment (CURE) on SR 9, 17, 85, 87, 152, 237, US 101, and I-280, I-680, and I-880	Draft 2018 SHOPP
SCL	Various	Various	Various	16748	0K080	Collision reduction	On all of the State Routes within Santa Clara County - Install accessible pedestrian signals (APS) and pedestrian countdown timers.	Draft 2018 SHOPP
SCL	Various	Various	Various	16043	4J930	Water conservation/Roadside Rehabilitation	Convert potable irrigation to recycled water on SR 85 and SR 237 and US 101	Draft 2018 SHOPP
SCL	Various	Various	Various	19066		Storm Water mitigation	Install best management practices (storm water mitigation) at Route 17, 85, 87, 101, 237, 280	2017 10-Year SHOPP Plan
SCL	Various	Various	Various		2J780		In various cities on various routes at Saratoga Creek Bridge, Carnadero Creek Bridge, San Francisco Creek Bridge, San Tomas Aquino Creek Bridge, and Bodfish Creek Bridge. Bridge preventative maintenance.	Draft 2018 SHOPP
SCL	Various	Various	Various	18043	3K330		In Santa Clara County, on Routes 17, 85, 87, 101, 152, 237, 280, and 680 at various locations. Repair and replace existing Transportation Management System elements.	2016 SHOPP
SCL	Various	Various	Various	20864	0Q890	Storm damage permanent restoration	In Santa Clara County, at various locations, remove drought stricken trees	2017 10-Year SHOPP Plan
SCL	101	17.50	38.30	17177		Mobility	Install TOS/RM and Fiber Communications on SCL 101 between Cochrane Road and Route 880.	2017 10-Year SHOPP Plan
SCL	101	18.70	18.70	20706		Drainage pump plants	In Santa Clara County, in San Jose, at the Route 130 separation, and near Morgan Hill, at Burnett Avenue, rehabilitate pump stations 37-0342W and 37-0290W	2017 10-Year SHOPP Plan
SCL	101	R26.44	R26.44			Implement ramp meters at SB on-ramp	SB Rte 85 for HOV	Draft 2017 Ramp Metering Development Plan
SCL	101	27.60	40.20	20317		Pavement	0.6 mile north of Bernal Road to Guadalupe River	2017 10-Year SHOPP Plan

County	Route	Begin Postmile	End Postmile	SHOPP ID	EA	Title	Description	Source*
SCL	101	R28.67	R28.67			Implement ramp meters at SB on-ramp	WB Silver Creek Valley Rd / Blossom Hill Rd	Draft 2017 Ramp Metering Development Plan
SCL	101	34.16	34.16			Implement ramp meters at SB on-ramp	SB Rte 280 / SB Rte 680	Draft 2017 Ramp Metering Development Plan
SCL	101	34.40	34.65	20484		Roadside	Roadside Planting Rehabilitation at US-101/Story Road overcrossing	2017 10-Year SHOPP Plan
SCL	101	34.44	34.44			Implement ramp meters at SB on-ramp	EB Story Rd	Draft 2017 Ramp Metering Development Plan
SCL	101	34.44	34.44			Implement ramp meters at SB on-ramp	WB Story Rd	Draft 2017 Ramp Metering Development Plan
SCL	101	34.65	35.25	20405		Roadside	Roadside Planting Rehabilitation at US-101/I-680/I/280 Interchange	2017 10-Year SHOPP Plan
SCL	101	36.60	41.10	19024	1K530	Drainage	In Santa Clara and San Mateo counties, at pump stations 35-0292W, 35-0243W, 37-0205W, 37-0036W, 37-0118W, and 37-0122W, rehabilitate pump elements and controls	2017 10-Year SHOPP Plan
SCL	101	37.00	39.00		1K280	Improve traffic operations	Modify interchange at US 101/Blossom Hill Rd. in San Jose	2017 10-Year SHOPP Plan
SCL	101	38.17	38.17			Implement ramp meters at SB on-ramp	NB Rte 880	Draft 2017 Ramp Metering Development Plan
SCL	101	38.26	38.26			Implement ramp meters at NB on-ramp	NB Rte 880	Draft 2017 Ramp Metering Development Plan
SCL	101	38.35	38.35			Implement ramp meters at SB on-ramp	SB Rte 880	Draft 2017 Ramp Metering Development Plan
SCL	101	38.79	38.79			Implement ramp meters at NB on-ramp	Old Bayshore Hwy	Draft 2017 Ramp Metering Development Plan
SCL	101	38.91	38.91			Implement ramp meters at SB on-ramp	N 4th St / Matrix Blvd / N 1st St	Draft 2017 Ramp Metering Development Plan
SCL	101	39.95	40.96	20467		Operational Improvements	SCL 101 PM 39.95/40.96 & SCL 87 PM 9.2 - Widen southbound US 101 to southbound SR 87 to 2 lanes	2017 10-Year SHOPP Plan
SCL	101	39.96	39.96			Operational improvements	Widen Southbound US 101 freeway connector to Southbound SR 87 to add a second lane and install TOS.	2017 10-Year SHOPP Plan
SCL	101	40.20	52.60	15908		Pavement	Guadalupe River to San Mateo County Line	2017 10-Year SHOPP Plan
SCL	101	46.25	46.25			Implement ramp meters at NB on-ramp	WB Rte 237 / W Moffett Park Dr	Draft 2017 Ramp Metering Development Plan

County	Route	Begin Postmile	End Postmile	SHOPP ID	EA	Title	Description	Source*
SCL	101	48.00	49.00		4K700	Improve pedestrian and bicycle connection	US 101/Shoreline BLVD northbound off-ramp modifications	2017 10-Year SHOPP Plan
SCL	101	48.36	48.36			Implement ramp meters at NB on-ramp	NB Rte 85 for HOV	Draft 2017 Ramp Metering Development Plan
SCL	101	49.66	49.66			Implement ramp meters at SB on-ramp	EB Charleston Rd	Draft 2017 Ramp Metering Development Plan
SCL	101	TBD	TBD		0K710	Improve traffic operations	Modify interchange at US 101/Zanker Rd./Skyport Dr./Fourth St. in San Jose	2017 10-Year SHOPP Plan
SCL SM	101	50.60 0.00	52.55 21.80		1J560	Improve traffic operations	Add HOV lanes in both directions	2017 10-Year SHOPP Plan
SM	101	1.85	1.85			Implement ramp meters at NB on-ramp	NB Willow Rd	Draft 2017 Ramp Metering Development Plan
SM	101	1.96	1.96			Implement ramp meters at NB on-ramp	SB Willow Rd	Draft 2017 Ramp Metering Development Plan
SM	101	0.00	6.70	20505		Pavement rehabilitation	Pavement rehabilitation from Santa Clara County Line to 0.1 mile north of Whipple Ave OC	2017 10-Year SHOPP Plan
SM	101	0.10	23.40	9250	2J740	Bridge rail replacement/upgrade	Bridge Rail Replacement/upgrade	Draft 2018 SHOPP
SM	Various	Various	Various	18044	3K340	Repair detection devices	In San Mateo and San Francisco Counties, on Routes 80, 92, 101, and 280 at various locations. Repair and replace existing Transportation Management System elements.	2016 SHOPP
SM	Various	Various	Various	16801	3J900	Overlay with OG friction	On Routes 92, 101 and 280 in Daly City, San Bruno and San Mateo at four locations. Wet pavement conditions safety improvements.	2016 SHOPP
SM	Various	Various	Various	16752	0K070	Collision reduction	In San Mateo County on Routes 1, 35, 82, 84, 92, 101, 109, 114, 280, and 380 - Install Accessible Pedestrian Signal (APS) systems and pedestrian countdown timers to enhance pedestrian safety	Draft 2018 SHOPP
SM	Various	Various	Various		2J690	Improve safety and reduce collisions	In San Mateo County at various locations - upgrade metal beam guardrail	2017 10-Year SHOPP Plan
SM	Various	Various	Various	17151		Improve safety and reduce collisions	In SM Sol - install curve warning signs	2017 10-Year SHOPP Plan

County	Route	Begin Postmile	End Postmile	SHOPP ID	EA	Title	Description	Source*
SM	Various	Various	Various	17165		Operation Improvements	Install TOS/RM and Fiber on SM101 (PM 0.0/20.8); SCL101 (PM 38.30/52.55); SM 92 (PM R11.5/R18.8); ALA92 (PM 0.0/R2.6); SM84 (PM 25.7/30.20); and ALA84 (PM 0.0/R3.2).	2017 10-Year SHOPP Plan
SM	Various	Various	Various	17179		Operation Improvements	San Mateo County several routes (active RM locations). Replace Model 170 to Model 2070 Controllers. (80 Locations). REPLACEMENT OF "METER ON" PED HEADS with W3-7/3-8 w/Flashing Beacons	2017 10-Year SHOPP Plan
SM	Various	Various	Various	18185		ADA curb ramp upgrade and pedestrian infrastructure	In SM & Sol Counties - curb ramp/ sidewalk/ APS improvements	2017 10-Year SHOPP Plan
SM	Various	Various	Various		0Q080	Operation Improvements	In SM Sol counties, install/modify signal	2017 10-Year SHOPP Plan
SM	Various	Various	Various	20364		Safety - Monitoring	SM county - 90 Overhead sign structures box beam replacement	2017 10-Year SHOPP Plan
SM	Various	Various	Various	20365		Safety - Monitoring	San Mateo county - 2000 panels replacement	2017 10-Year SHOPP Plan
SM	Various	Various	Various	17968		Improve safety and reduce collisions	In San Mateo County on various route (Rte. 92, 101, 280, & 380) at various location - Install Rectangular Rapid Flashing Beacons (RRFB)	2017 10-Year SHOPP Plan
SM	Various	Various	Various		0Q640	Improve mobility by deploying Intelligent Transportation System (ITS) elements	Deploy intelligent transportation systems (ITS) in Daly City/Brisbane on US 101, I-280, SR 82, SR 1, and SR 35	2017 10-Year SHOPP Plan
SM	101	6.70	16.50	20506		Pavement rehabilitation	Pavement rehabilitation from 0.1 mile north of Whipple Ave OC to Broadway Ave OC	2017 10-Year SHOPP Plan
SM	101	7.13	7.13	9224	2J730	Bridge replacement	Replace bridge at Cordilleras Creek #35-0019	Draft 2018 SHOPP
SM	101	11.85	11.85			Implement ramp meters at NB on-ramp	EB Rte 92	Draft 2017 Ramp Metering Development Plan
SM	101	11.90	11.90	20666		Operational Improvements	Expand existing Park and Ride lot at south-western quadrant of US-101/SR-92 interchange to create additional 90 new parking spaces	2017 10-Year SHOPP Plan
SM	101	11.92	11.92			Implement ramp meters at SB on-ramp	WB Rte 92	Draft 2017 Ramp Metering Development Plan

County	Route	Begin Postmile	End Postmile	SHOPP ID	EA	Title	Description	Source*
SM	101	12.33	12.33	18233		Pavement	At the SB Route 101 Off Ramp to Route 92 (SM-101-12.325) in San Mateo City - to improve the congestion include shifting the existing gore area striping, modifications of existing sign structures and roadway paving	2017 10-Year SHOPP Plan
SM	101	16.46	16.46			Implement ramp meters at SB on-ramp	Rollins Rd / Broadway / Cadillac Way	Draft 2017 Ramp Metering Development Plan
SM	101	16.77	16.77			Implement ramp meters at NB on-ramp	Broadway / Airport Blvd / Old Bayshore Hwy	Draft 2017 Ramp Metering Development Plan
SM	101	19.45	19.45			Implement ramp meters at SB on-ramp	EB Rte 380	Draft 2017 Ramp Metering Development Plan
SM	101	16.50	23.00		3J060	Pavement preservation	In the cities of Burlingame, Millbrae, San Bruno and South San Francisco, from Broadway to Oyster Point Boulevard. Pavement rehabilitation.	Draft 2018 SHOPP
SM	101	17.50	26.10		4K280	Storm damage	In Millbrae, from 0.4 mile south of Millbrae Avenue to San Francisco County line; also in San Francisco, from Alana Way to Silver Avenue (PM 0.0 to PM 1.8). Repair storm damaged roadway.	2016 SHOPP
SM	101	20.70	21.70		4H360	Improve access	US 101/Produce Ave Interchange in South San Francisco	2017 10-Year SHOPP Plan
SM	101	23.00	26.10	20645		Pavement	0.2 mile north of Oyster Point OC to San Francisco County Line	2017 10-Year SHOPP Plan
ALA ALA SF ALA SF SM	880 80 80 980 101 101	23.10 0.00 3.80 0.00 0.00 R20.80	35.40 3.80 8.90 1.20 4.24 26.10	16829		ALA880(23.1/35.4) between Davis St. and Route 80; ALA80(0.0/3.8) between SF/ALA County Line and Powell St.; SF80(3.8/8.9) between Route 101 and SF/ALA County Line.; ALA980(0.0/1.2) between Route 880 and Route 580; SF101(0.0/4.24) between SM/SF County Line and Route 80; and SM101 (R20.8/26.1) between SF/SM County Line and Route 380.	Install TOS Elements and Fiber	2017 10-Year SHOPP Plan

County	Route	Begin Postmile	End Postmile	SHOPP ID	EA	Title	Description	Source*
SM SF SF SF	1 101 101 101	R44.21 2.00 2.20 2.84	R44.21 2.00 2.20 2.84	17980	2K190	Bridge preservation	Baluster bridge rail replacement	Draft 2018 SHOPP
SF	101	0.00	4.24	16805	4J390	Mitigate wet pavement collisions	Drainage improvements, overlay existing AC with OGFC, and groove existing PCC pavement	Draft 2018 SHOPP
SF	101	0.60	0.60			Implement ramp meters at SB on-ramp	WB Third St / SB Bayshore Blvd	Draft 2017 Ramp Metering Development Plan
SF	101	0.69	0.69			Implement ramp meters at NB on-ramp	NB Bayshore Blvd / Hester Ave	Draft 2017 Ramp Metering Development Plan
SF	101	1.42	1.42			Implement ramp meters at SB on-ramp	Rte 280	Draft 2017 Ramp Metering Development Plan
SF	101	1.64	1.64			Implement ramp meters at SB on-ramp	San Bruno Ave / WB Silliman St	Draft 2017 Ramp Metering Development Plan
SF	101	1.70	4.20	19959		Roadside planting	Rehabilitate Highway Planting	2017 10-Year SHOPP Plan
SF	101	1.99	R4.24	20532		Collision reduction	SF 101 PM 1.99/R4.24 - From Alamany to 80/101 split, replace concrete barrier	2017 10-Year SHOPP Plan
SF	101	2.00	2.00		3G620		Near San Francisco, at Alemany Circle Undercrossing No. 34-0033. Rehabilitate bridge. (G13 Contingency Project)	Draft 2018 SHOPP
SF	101	2.00	2.00			Implement ramp meters at SB on-ramp	EB Alemany Blvd / WB Industrial St	Draft 2017 Ramp Metering Development Plan
SF	101	2.16	2.16			Implement ramp meters at NB on-ramp	EB Alemany Blvd / NB San Bruno Ave	Draft 2017 Ramp Metering Development Plan
SF	101	2.24	2.24			Implement ramp meters at NB on-ramp	WB Rte 280	Draft 2017 Ramp Metering Development Plan
SF	101	2.61	4.77	20320		Roadway rehabilitation	Pavement rehabilitation from Faith Street POC to Route 80	2017 10-Year SHOPP Plan
SF	101	2.94	2.94			Implement ramp meters at SB on-ramp	WB Cesar Chavez St / Precita Ave	Draft 2017 Ramp Metering Development Plan
SF	101	2.94	2.94			Implement ramp meters at SB on-ramp	SB Potrero Ave	Draft 2017 Ramp Metering Development Plan
SF	101	3.11	3.11			Implement ramp meters at NB on-ramp	WB Cesar Chavez St	Draft 2017 Ramp Metering Development Plan
SF	101	3.11	3.11			Implement ramp meters at NB on-ramp	NB Bayshore Blvd	Draft 2017 Ramp Metering Development Plan

County	Route	Begin Postmile	End Postmile	SHOPP ID	EA	Title	Description	Source*
SF	101	3.37	3.37	19051		Bridge rail upgrade and replacement	23 rd St. OC No. 34-0035: Br Rail Baluster	2017 10-Year SHOPP Plan
SF	101	3.90	3.90	20672		Operational Improvements	Construct a new Park and Ride lot at 16th Street for 116 new parking spaces	2017 10-Year SHOPP Plan
SF	101	4.10	R5.10		2J800		In the City and County of San Francisco, at the Central Viaduct (No. 34-0077) from south of 17th Street to S. Van Ness Avenue ; also, on Route 80 at the Bayshore Viaduct (No. 34-0088) from Route 101 to 4th Street (PM 3.9/4.8). Paint superstructure steel members. (G13 Contingency Project)	Draft 2018 SHOPP
SF	101	4.12	R4.25	19052	0Q020	Bridge preservation	Bayshore Viaduct Br. No. 34-0088: Br Health Poor & Central Via Br. No. 34-0077: Bridge Health Fair; Rehabilitation and rails	2017 10-Year SHOPP Plan
SF	101	4.20	4.20	17020	2K950	Facility	Replace District Materials Lab	Draft 2018 SHOPP
SF	101	T4.50	7.80	20442	0Q320	Relinquishment	Relinquish Van Ness Avenue and Lombard Street to the City and County of San Francisco. Financial Contribution Only. Legislation is not in place. We'll work with City of San Francisco to get the legislation.	2017 10-Year SHOPP Plan
SF	101 280	2.00 R2.80	4.20 T7.10	16071	4J970	Reduce the frequency and duration of highway workers' exposure to traffic	Anti-vandalism measures, e.g. replace fencing	Draft 2018 SHOPP
SF	Various	Various	Various	16747	3J890		In the City of San Francisco, on Routes 1, 35, 80, 101 and 280 at various locations. Crosswalk safety enhancements.	Draft 2018 SHOPP
SF	Various	Various	Various	16876		Improve safety and reduce collisions	in SF SCL, at various locations - Clean up roadside environment	2017 10-Year SHOPP Plan
SF	Various	Various	Various	17149		Improve safety and reduce collisions	In SF SCL - install curve warning signs	2017 10-Year SHOPP Plan
SF	Various	Various	Various	18181		ADA curb ramp upgrade and pedestrian infrastructure	In SF & SCL Counties - Upgrade curb ramps, sidewalk, & APS	2017 10-Year SHOPP Plan
SF	Various	Various	Various	19069		Storm Water mitigation	Install best management practices (storm water mitigation) at Route 1 & 101	2017 10-Year SHOPP Plan

County	Route	Begin Postmile	End Postmile	SHOPP ID	EA	Title	Description	Source*
SF	280	0.00	R7.50	17844	0Q120	Capital preventive maintenance	Pavement CAPM from St Charles Ave OC to Brannan St. & BrH+Rail Southern Fwy 34-0046 & Seis+Rail RTE 280/82 34-0085 & Seis+GM Whipple Ave POC 34-0096	2017 10-Year SHOPP Plan
SF	280	4.00	4.02	20278		Facilities	Replace roll up doors, upgrade facility for ADA compliance, paint facility, upgrade to LED and water conservation devices / Rickard Street Specialty and SF Maintenance (5728 & 5701)	2017 10-Year SHOPP Plan
SF	280	R4.52	R4.52			Implement ramp meters at NB on-ramp	NB Rte 101	Draft 2017 Ramp Metering Development Plan
SF	280	R5.76	R5.76			Implement ramp meters at SB on-ramp	Pennsylvania Ave / Cesar Chavez St	Draft 2017 Ramp Metering Development Plan
SF	280	R6.06	R6.06			Implement ramp meters at NB on-ramp	25 St / Indiana St	Draft 2017 Ramp Metering Development Plan
SF	280	R6.52	R6.52			Implement ramp meters at SB on-ramp	Mariposa St / Pennsylvania St	Draft 2017 Ramp Metering Development Plan
SF	280	R6.64	R6.64			Implement ramp meters at NB on-ramp	18th St / Minnesota St	Draft 2017 Ramp Metering Development Plan
Various	Various	Various	Various	18684	0P380	Transportation Management Services	Restoration of Non-Operational Vehicle Detection Devices	2017 10-Year SHOPP Plan
Various	Various	Various	Various	18071	3K360	Repair detection devices	Restoration of Non-Operational Vehicle Detection Devices	2017 10-Year SHOPP Plan

* 2016 SHOPP: Project in the adopted 2016 SHOPP program and in pre-construction phases, including projects amended into the program from future cycles due to Senate Bill 1 funding augmentation

Draft 2018 SHOPP: Draft project list for the 2018 SHOPP program to be adopted by the California Transportation Commission in 2018

2017 10-Year SHOPP Plan: Projects in the 2017 Ten-Year SHOPP Plan but not included in previous programs

Draft 2017 Ramp Metering Development Plan: Planned ramp metering projects consistent with the Ten-Year SHOPP Plan with specific locations

6.2 Short-Term Highway and Transit Project Evaluation

A qualitative evaluation was conducted to gauge how a project would help meet the Corridor Goals outlined in Chapter 3 Corridor Goals, Objectives and Performance Metrics. Depending on the level of impact, a project would receive a high, medium or low grade under each of the seven goals. The evaluation was focused on short-term (0-4 years) highway and transit projects only due to time constraints.

While many goals are clearly defined and self-explanatory, others require additional interpretation. For highway projects, the evaluation was based on the following assumptions.

- Projects similar in nature will receive similar grades. For example, interchange reconfiguration projects will be graded similarly unless the scope of a project includes specific components (such as active transportation improvement) that result in different grades
- For Goal 3 – Improve trip reliability within the Corridor, trip reliability is defined as reliability of vehicular trips on the freeway within the Corridor
- For Goal 6 – Support economic prosperity, the emphasis is on the reduction of freeway congestion that benefits economic productivity
- For Goal 7 – Efficiently manage transportation assets within the Corridor to protect existing and future investment, transportation assets are limited to assets on US 101 and I-280 within the Corridor

For transit projects, a slightly different set of assumptions were used for the following goals.

- For Goal 3 – Improve trip reliability within the Corridor, trip reliability is defined as transit trip reliability within the Corridor
- For Goal 6 – Support economic prosperity, the focus is on how a transit project would help improve the livability of a community that contributes to economic prosperity
- For Goal 7 – Efficiently manage transportation assets within the Corridor to protect existing and future investment, transportation assets are limited to transit assets, most of which are located outside of freeways

Tables 56 and 57 include the evaluation results for short-term highway and transit projects respectively. Because of the differences in assumptions, a comparison between highway and transit projects would not yield a meaningful conclusion. Instead, the evaluation results mainly help demonstrate the best performers within each project category in terms of their impacts on advancing the Corridor Goals. Ratings were developed in consultation with CDT members.

Table 59 *Short-Term Highway Project Evaluation Results*
(not in priority order)

Co.	Title	Description	RTP ID	Goal 1: Provide a safe transportation system to all users within the Corridor	Goal 2: Reduce recurring freeway congestion and improve freeway efficiency in moving people	Goal 3: Improve trip reliability within the Corridor	Goal 4: Support an accessible and inter-connected multimodal transportation system within the Corridor	Goal 5: Reduce pollutants and GHG emissions within the Corridor	Goal 6: Support economic prosperity	Goal 7: Efficiently manage transportation assets within US 101 to protect existing and future investment
SCL	US 101/SR 152/10th St. Ramp and Intersection Improvements	Modify SB US 101 off-ramp to 10th St. and intersection in Gilroy.	17-07-0079	Low	Medium	Medium	Low	Low	Medium	Low
SCL SM	US 101 Express Lanes: Whipple Ave. in San Mateo County to Cochrane Rd. in Morgan Hill.	Convert HOV Lanes to EL and add EL in some segments.	17-07-0075	Medium	High	High	Medium	Medium	High	High
SCL	Double Lane Southbound US 101 off-ramp to Southbound SR 87	Widen Southbound US 101 freeway connector to Southbound SR 87 to add a second lane and install TOS.	17-07-0044	Low	Medium	Medium	Low	Low	Medium	Low
SCL	US 101 Southbound/ Trimble Rd./De La Cruz Blvd./Central Expwy. Interchange Improvements	Improve interchange at U.S. 101 southbound Trimble Road/ De la Cruz Boulevard/Central Expressway.	17-07-0031	High	Medium	Medium	Low	Low	Medium	Low
SCL	SR 237/Mathilda Ave. and US 101/Mathilda Ave. Interchange Improvement	Modify US 101/Mathilda and SR 237/Mathilda interchanges, reducing to one signalized intersection and increasing intersection spacing in the Mathilda Ave./SR 237 interchange	17-07-0033	High	High	Medium	Low	Low	Medium	Medium

Co.	Title	Description	RTP ID	Goal 1: Provide a safe transportation system to all users within the Corridor	Goal 2: Reduce recurring freeway congestion and improve freeway efficiency in moving people	Goal 3: Improve trip reliability within the Corridor	Goal 4: Support an accessible and inter-connected multimodal transportation system within the Corridor	Goal 5: Reduce pollutants and GHG emissions within the Corridor	Goal 6: Support economic prosperity	Goal 7: Efficiently manage transportation assets within US 101 to protect existing and future investment
		area. Project to include ramp improvements, addition of auxiliary lanes, and construction of new ramp configurations.								
SCL	US 101/SR 25 Interchange	The project consists of reconfiguring the interchange at US 101 and SR 25 just south of the City of Gilroy in Santa Clara County, connecting SR 25 and Santa Teresa Boulevard, and widening the existing freeway from 4 to 6 lanes from the Monterey Street interchange to the US 101/SR 25 interchange.	17-07-0069	Low	Medium	Medium	Low	Low	High	Low
SCL	Noise Abatement Program (Countywide)	General noise abatement program for countywide (Project extracted from PBA 2040 project ID 17-07-0064)	17-07-0064	Low	Low	Low	Low	Low	Low	Medium
SCL	Hwy. Transportation Operations System/Freeway Performance Initiative Phase 1 & 2	This project will implement traffic control systems based on the Regional Freeway Performance Initiative.	17-07-001	Medium	Medium	Medium	Low	Medium	Medium	High

Co.	Title	Description	RTP ID	Goal 1: Provide a safe transportation system to all users within the Corridor	Goal 2: Reduce recurring freeway congestion and improve freeway efficiency in moving people	Goal 3: Improve trip reliability within the Corridor	Goal 4: Support an accessible and inter-connected multimodal transportation system within the Corridor	Goal 5: Reduce pollutants and GHG emissions within the Corridor	Goal 6: Support economic prosperity	Goal 7: Efficiently manage transportation assets within US 101 to protect existing and future investment
SCL	US 101/Mabury Rd./Taylor St. Interchange Construction	Construct interchange at U.S. 101/Mabury Road/Taylor Street.	17-07-0027	Medium	Medium	Medium	High	Medium	Medium	Low
SCL	US 101/Blossom Hill Rd. Interchange Improvements	Widen interchange at U.S. 101/Blossom Hill Road, including bicycle lanes.	17-07-0038	High	Medium	Medium	High	Medium	Medium	Low
SM	Modify existing lanes on U.S. 101 to accommodate a managed lane	Modify existing lanes to accommodate an HOV lane from Whipple to San Francisco County Line and/ or an Express Lane from approximately 2 miles south of the Santa Clara County Line to San Francisco County Line. Work may include shoulder modification, ramp modifications, and interchange modifications to accommodate an extra lane. Work will be phased.	17-06-0007	Medium	High	High	Medium	Medium	High	High
SM	US 101/University Ave. Interchange Improvements	On University Avenue across US-101, between Woodland Avenue and Donohoe Street; Add bike lanes and sidewalk and modify the NB and SB off-ramps to eliminate pedestrian/bicycle conflicts and improve traffic operations.	17-06-0025	High	Medium	Medium	High	Medium	Medium	Low

Co.	Title	Description	RTP ID	Goal 1: Provide a safe transportation system to all users within the Corridor	Goal 2: Reduce recurring freeway congestion and improve freeway efficiency in moving people	Goal 3: Improve trip reliability within the Corridor	Goal 4: Support an accessible and inter-connected multimodal transportation system within the Corridor	Goal 5: Reduce pollutants and GHG emissions within the Corridor	Goal 6: Support economic prosperity	Goal 7: Efficiently manage transportation assets within US 101 to protect existing and future investment
SM	Improve U.S. 101/Woodside Road interchange	Modifies the Woodside Road Interchange at US 101.	17-06-0010	High	Medium	Medium	High	Low	Medium	Low
SM	Route 101/Holly St Interchange Access Improvements	The proposed project would convert the existing full cloverleaf configuration to a partial cloverleaf design by eliminating two of the existing loop off-ramps of the interchange, and realign the diagonal on- and off-ramps into signalized T-intersections with local streets. A new pedestrian and bicycle over crossing will be constructed in the south side of Holly Street Interchange.	17-06-0017	High	Medium	Medium	High	Low	Medium	Low
SF	HOV/HOT Lanes on U.S. 101 and I-280 in San Francisco	Phase 1 (full implementation): Convert an existing mixed traffic lane and/or shoulder/excess ROW in each direction to HOV 3+ lanes on US 101 from SF/SM County line to I-280 interchange and on I-280 from US 101 interchange to 6th Street off	17-05-0020	Medium	High	High	Medium	Medium	High	High

Co.	Title	Description	RTP ID	Goal 1: Provide a safe transportation system to all users within the Corridor	Goal 2: Reduce recurring freeway congestion and improve freeway efficiency in moving people	Goal 3: Improve trip reliability within the Corridor	Goal 4: Support an accessible and inter-connected multimodal transportation system within the Corridor	Goal 5: Reduce pollutants and GHG emissions within the Corridor	Goal 6: Support economic prosperity	Goal 7: Efficiently manage transportation assets within US 101 to protect existing and future investment
		ramp to enhance carpool and transit operations during peak periods. Phase 2 (planning and environmental review only): Convert Phase 1 HOV lanes to HOT/Express Lanes. Express transit to be funded with HOT lane revenues.								

Table 60 *Short-Term Transit Project Evaluation Results*
(not in priority order)

Co.	Title	Description	RTP ID	Goal 1: Provide a safe transportation system to all users within the Corridor	Goal 2: Reduce recurring freeway congestion and improve freeway efficiency in moving people	Goal 3: Improve trip reliability within the Corridor	Goal 4: Support an accessible and inter-connected multimodal transportation system within the Corridor	Goal 5: Reduce pollutants and GHG emissions within the Corridor	Goal 6: Support economic prosperity	Goal 7: Efficiently manage transportation assets within the Corridor to protect existing and future investment
SCL	Affordable fares	Increase ridership by reducing the cost of transit services for low-income populations including seniors, persons with disabilities, youth and students.	17-07-0007	Medium	Low	Low	High	Medium	Medium	Low
SCL	Bus Stop Improvements	Create comfortable and dignified transit waiting environments by improving accessibility and amenities at VTA bus stops.	17-07-0056	Medium	Low	Low	Medium	Low	Low	Low
SCL	North First Street light rail speed Improvements	This project would improve light rail service and reliability along North First Street. Some of the problems in this area include signal timing issues, slow speeds (maximum speed currently restricted to 35mph), and unscheduled stops. Fencing along this corridor would allow maximum speeds to increase to 45 mph, and combined with improvements to signal timing.	17-07-0060	High	Medium	Medium	Low	Low	Medium	Medium
SCL	Implement El Camino Rapid Transit Project	Implement Rapid line 522 improvements in the El Camino Real/The Alameda corridor including: dedicated guideways,	17-07-0013	High	High	High	High	High	High	High

Co.	Title	Description	RTP ID	Goal 1: Provide a safe transportation system to all users within the Corridor	Goal 2: Reduce recurring freeway congestion and improve freeway efficiency in moving people	Goal 3: Improve trip reliability within the Corridor	Goal 4: Support an accessible and inter-connected multimodal transportation system within the Corridor	Goal 5: Reduce pollutants and GHG emissions within the Corridor	Goal 6: Support economic prosperity	Goal 7: Efficiently manage transportation assets within the Corridor to protect existing and future investment
		signal prioritization, low-floor boarding, ticket vending machines, premium stations, real-time information, and specialized vehicles.								
SCL	Alum Rock/Santa Clara Street Bus Rapid Transit	Implement Rapid Transit improvements in the Santa Clara/Alum Rock route, including: dedicated guideways, signal prioritization, ticket vending machines, premium stations, real-time information, and specialized vehicles.	17-07-0080	High	Medium	Medium	High	Medium	High	Medium
SCL	Caltrain Grade Separations	This project includes grade separations of the Caltrain right of way at priority locations throughout Santa Clara County	17-07-0002	High	Medium	High	Medium	Low	Low	Low
SCL	Stevens Creek Bus Rapid Transit	Implement Rapid Transit improvements in the Stevens Creek corridor including: dedicated guideways, signal prioritization, low-floor boarding, ticket vending machines, premium BRT stations, real-time information, and specialized vehicles.	17-07-0059	High	Medium	Medium	High	Medium	High	Medium

Co.	Title	Description	RTP ID	Goal 1: Provide a safe transportation system to all users within the Corridor	Goal 2: Reduce recurring freeway congestion and improve freeway efficiency in moving people	Goal 3: Improve trip reliability within the Corridor	Goal 4: Support an accessible and inter-connected multimodal transportation system within the Corridor	Goal 5: Reduce pollutants and GHG emissions within the Corridor	Goal 6: Support economic prosperity	Goal 7: Efficiently manage transportation assets within the Corridor to protect existing and future investment
SM	Implement supporting infrastructure and Automated Transit Signal Priority to support SamTrans express rapid bus service along El Camino Real	This project will institute necessary infrastructure and Automated Transit Signal Priority necessary to accommodate express rapid bus service along the length of El Camino Real from Palo Alto to Daly City.	17-06-0027	Low	Medium	Medium	Medium	Medium	Low	Medium
SM	Add new rolling stock and infrastructure to support SamTrans bus rapid transit along El Camino Real	This project will institute new rolling stock and infrastructure necessary to accommodate BRT along El Camino Real	17-06-0029	High	High	High	High	High	High	High
SM	Implement incentive programs to support transit-oriented development	Implement an incentive programs to support transit-oriented developments in San Mateo County.	17-06-0026	Low	Low	Low	Medium	High	Medium	Low
SM	Grade Separations	This project includes grade separations of the Caltrain right of way at approximately 2 to 3 high priority locations in San	17-06-0039	High	Medium	High	Medium	Low	Low	Low

Co.	Title	Description	RTP ID	Goal 1: Provide a safe transportation system to all users within the Corridor	Goal 2: Reduce recurring freeway congestion and improve freeway efficiency in moving people	Goal 3: Improve trip reliability within the Corridor	Goal 4: Support an accessible and inter-connected multimodal transportation system within the Corridor	Goal 5: Reduce pollutants and GHG emissions within the Corridor	Goal 6: Support economic prosperity	Goal 7: Efficiently manage transportation assets within the Corridor to protect existing and future investment
		Mateo County, including 25th Avenue. This project is based on San Mateo County's Measure A grade separation category.								
SM	Make incremental increases in SamTrans paratransit service - Phase	Expansion of curb-to-curb paratransit fleet and service for eligible users, compliant with ADA requirements, based on projected future demand.	17-06-0028	High	Low	Low	Medium	Low	Medium	Low
SM	Introduction of Express Bus Network Serving US 101	This project would re-introduce a robust network of express buses on US-101 serving San Mateo County, San Francisco County, and Santa Clara County. The express buses would be operated by SamTrans, potentially in conjunction with a managed lane in San Mateo County and managed lanes in other jurisdictions.	17-10-0033	High	High	High	High	High	High	High
SF	22 Fillmore Transit Priority Project	As part of Muni Forward, the SFMTA is planning transit priority and pedestrian safety improvements for the 22 Fillmore route along 16th Street, including transit-only lanes, transit bulbs and islands, new traffic signals, and several pedestrian safety upgrades. This		High	Low	Low	Medium	Low	Medium	Medium

Co.	Title	Description	RTP ID	Goal 1: Provide a safe transportation system to all users within the Corridor	Goal 2: Reduce recurring freeway congestion and improve freeway efficiency in moving people	Goal 3: Improve trip reliability within the Corridor	Goal 4: Support an accessible and inter-connected multimodal transportation system within the Corridor	Goal 5: Reduce pollutants and GHG emissions within the Corridor	Goal 6: Support economic prosperity	Goal 7: Efficiently manage transportation assets within the Corridor to protect existing and future investment
		project will correlate with several infrastructure upgrades along 16th Street, including repaving and utility work, and will also include extending the overhead contact system (OCS) from Kansas Street to Third Street to allow for zero-emission transit service into Mission Bay.								
SF	Implement Transbay Transit Center/Caltrain Downtown Extension (Phase 1 - Transbay Transit Center)	The project has 3 components: (1) new Transbay Transit Center built on the site of the former Transbay Terminal in downtown San Francisco serving 11 transportation systems; (2) extension of Caltrain commuter rail service from its current San Francisco terminus at 4th & King Streets to a new underground terminus; and (3) establishment of a Redevelopment Area Plan with related development projects.	17-10-0039	Medium	High	High	High	High	High	High
SF	San Bruno Avenue Multimodal Improvement Project	The San Bruno Ave Multimodal Improvement Project includes pedestrian safety, transit priority and parking management proposals that will make the street safer for people walking, increase the reliability	17-06-0031	High	Medium	Medium	High	Medium	Medium	Medium

Co.	Title	Description	RTP ID	Goal 1: Provide a safe transportation system to all users within the Corridor	Goal 2: Reduce recurring freeway congestion and improve freeway efficiency in moving people	Goal 3: Improve trip reliability within the Corridor	Goal 4: Support an accessible and inter-connected multimodal transportation system within the Corridor	Goal 5: Reduce pollutants and GHG emissions within the Corridor	Goal 6: Support economic prosperity	Goal 7: Efficiently manage transportation assets within the Corridor to protect existing and future investment
		of Muni, and address parking availability in the neighborhood. This project has been approved by the SFMTA Board of Directors in October 2016.								
SF	Establish new ferry terminal at Mission Bay 16th Street	Establish New Ferry terminal to serve Mission Bay and Central Waterfront neighborhoods	17-05-0019	Medium	Low	Medium	Medium	Low	Medium	Medium
SF	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 including but not limited to projects such as TDM program implementation, parking management, local area shuttle and paratransit services	17-05-0002	Medium	High	Low	Medium	High	Low	High
SF	Arena Transit Capacity Improvements	Identifies transit improvements needed to accommodate growth in Mission Bay. Improvements might include track crossovers to allow for trains to be staged; a 6-inch raised area along existing tracks; a platform extension to accommodate crowds; other trackway modifications; and a	17-05-0034	Medium	Medium	High	Medium	Low	High	High

Co.	Title	Description	RTP ID	Goal 1: Provide a safe transportation system to all users within the Corridor	Goal 2: Reduce recurring freeway congestion and improve freeway efficiency in moving people	Goal 3: Improve trip reliability within the Corridor	Goal 4: Support an accessible and inter-connected multimodal transportation system within the Corridor	Goal 5: Reduce pollutants and GHG emissions within the Corridor	Goal 6: Support economic prosperity	Goal 7: Efficiently manage transportation assets within the Corridor to protect existing and future investment
		traction power study to ensure that the power grid can accommodate a large number of idling vehicles.								
SF	County Safety, Security and Other	Projects in this category address safety and security needs including Vision Zero improvements at ramps, local road safety and security, India Basin roadway transportation improvements, and transit safety and security	17-05-0003	High	Low	Low	Medium	Low	Low	Medium
SF	Regional/Local Express Bus to Support Express Lanes in SF	A 5-year regional/local express bus pilot to provide service to/from downtown San Francisco to/from San Francisco neighborhoods, Marin, Contra Costa, Alameda, San Mateo and Santa Clara counties to complement other freeway corridor management strategies. Some service to be funded with HOT lane revenues. See HOV/HOT Lanes on U.S. 101 and I-280 in San Francisco project. Includes vehicles.	17-05-0036	Medium	High	High	High	High	High	High
SF	San Francisco Late Night	New routes and increased frequency for all-night regional and local bus service, including	17-05-0011	High	Low	Medium	High	Low	Medium	Medium

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	Transportation Improvements	Muni, AC Transit, Golden Gate Transit, and SamTrans routes. This is a pilot for 5 years.								
SF	Southeast San Francisco Caltrain Station - Environmental	Planning and environmental analysis of Caltrain infill station to replace Paul Ave Station in Southeast San Francisco (e.g. Oakdale).	17-05-0028	High	Medium	Medium	High	Medium	High	High
SF	Muni Forward (Transit Effectiveness Project)	Includes transit priority improvements along Rapid and High Frequency transit corridors, service increases, transfer and terminal investments, overhead wire changes, and street improvements in support of Vision Zero.	17-05-0014	High	Medium	Medium	High	Medium	Medium	High
SF	Expand SFMTA Transit Fleet	This project entails future expansion of the SFMTA transit fleet and needed facilities to house and maintain transit vehicles. The purpose is to meet projected future transit demand, as indicated in the SFMTA Transit Fleet Plan. It will facilitate the future provision of additional service through the procurement of transit vehicles as well as the development of needed modern transit facilities.	17-05-0013	Low	Low	Medium	High	Medium	Medium	High

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		This also includes the expansion vehicles for Geary BRT (RTPID 17-05-0021) and does not include expansion vehicles for Central Subway, which are in RTPITD 17-05-0041.								
SF	SFgo Integrated Transportation Management System	SF go is San Francisco's Citywide ITS program. It identifies signalized and non-signalized intersections located along arterials and the Muni transit system and prioritizes them for ITS upgrades, such as controllers, cabinets, transit signal priority, fiber optic or wireless communications, traffic cameras, and variable message signs. Also improves arterial safety and pedestrian safety.	17-05-0012	High	Low	Medium	Medium	Low	Low	High
SF	Transit Preservation/ Rehabilitation	This project provides additional funding to transit capital preservation and rehabilitation beyond what is included in the regional transit capital project (RTPID 17-10-0026)	17-05-0007	Low	Low	Medium	High	Medium	Medium	High