

APPENDIX 1

CMP Roadway Network Segmentation and Changes

CMP NETWORK - ARTERIALS

Rationale for Segmentation

Street Name	Land Use	Speed Limit	Major Cross Street	Change In Volume	Free-way Ramp
1st Street					
Market-Harrison					
3rd Street					
Jamestown-Evans *		x	x		
Evans-China Basin		x			
China Basin-Market		x		x	
4th Street					
Market-Harrison					x
Harrison-3rd St					x
5th Street					
Market-Brannan					
6th Street					
Market-Brannan					
7th Street					
Brannan-Market					
8th Street					
Market-Bryant					
9th Street					
Brannan-Market					
10th Street					
Market-Brannan					
19th Avenue/Park Presidio Blvd					
U.S.101-Lake		x			
Lake-Lincoln		x	x		
Lincoln-Sloat			x		
Sloat-J.Serra			x		
Alemanly Blvd					
C & C limit-Lyell *		x			
Lyell-Bayshore		x			
Army Street					
Guerrero-Kansas *	x	x			x
Kansas-Bryant *					x
Bryant-3rd St.					x
Bay Street					
Van Ness-Embarcadero					
Bayshore Blvd					
Army-Industrial *			x		x
Industrial- C & C limit			x		x
Beale/Davis					
Clay-Mission					
Brannan Street					
Division-9th St					
6th St-5th St					
Broadway					
Gough-Larkin	x				

Street Name	Land Use	Speed Limit	Major Cross Street	Change In Volume	Free-way Ramp
Larkin-Powell (Tunnel)	x	x			
Powell-Montgomery		x			
Montgomery-Embarcadero			x		
Brotherhood Way					
J.Serra-Alemanay					
Bryant Street					
Division-4th St					x
4th St-Embarcadero					x
Bush Street					
Masonic-Gough	x				
Gough-Market *	x		x		
Castro/Divisadero Street					
Pine-Geary			x		
Geary-14th St	x		x		
14th St-Market	x		x		
Clay Street					
Kearny-Davis					
Columbus Avenue					
North Point-Greenwich				x	
Greenwich-Montgomery			x		
Drumm Street					
Washington-Market					
Duboce Avenue					
Market-Mission *	x				
Mission-Potrero	x				
The Embarcadero					
Townsend-North Point					
Evans Avenue					
Army-3rd St *					
Fell Street					
Gough-Laguna					x
Laguna-Stanyan					x
Franklin Street					
Market-Pine			x		
Pine-Lombard	x				
Fremont Street					
Harrison-Market *					
Fulton Street					
Masonic-Arguello		x	x		
Arguello-Park Presidio *		x	x		
Geary Blvd					
Market-Gough	x	x			
Gough-Arguello		x			
Arguello-25th Ave			x		
25th Ave-Great Hwy	x		x		

Street Name	Land Use	Speed Limit	Major Cross Street	Change In Volume	Free-way Ramp
Geneva Avenue					
Phelan-Cayuga	x				
Cayuga-Paris	x				
Paris-Santos	x				
Golden Gate Avenue					
Masonic-Franklin	x	x	x		
Franklin-Market	x	x	x		
Gough Street					
Pine-Geary			x		
Geary-Golden Gate *	x				
Golden Gate-Market	x				
San Jose Avenue/Guerrero					
Army-29th St	x	x			
29th St-Monterey Blvd					x
Harrison Street					
Embarcadero-1st St *					x
1st St-4th St					x
4th St-8th St					x
8th St-13th St					x
Hayes Street					
Market-Gough					
Howard Street					
Embarcadero-S.Van Ness					
Junipero Serra Blvd					
Sloat-19th Ave *		x	x		
19th Ave-Brotherhood Way			x		
Brotherhood-C & C limit			x		
Kearny Street					
Market-Columbus					
King Street					
6th St-Embarcadero					
Lincoln Blvd/Kezar Drive					
19th Ave-5th Ave	x				
5th Ave-Stanyan	x				
Lombard Street					
Francisco-Van Ness *					
Main Street					
Mission-Market					
Market/Portola					
Sloat-Santa Clara	x				
Santa Clara-Clipper *	Grade Change				
Clipper-Castro	x				
Castro-Guerrero	x				
Guerrero-Van Ness			x	x	
Van Ness-Drumm	x				

Street Name	Land Use	Speed Limit	Major Cross Street	Change In Volume	Free-way Ramp
Masonic Avenue					
Pine-Geary			x		
Geary-Page			x		
Mission/Otis					
Embarcadero-3rd St	x				
3rd St-9th St	x				
9th St-14th St	x				
14th St-Army *	x				
Army-Ocean *			x		
Ocean-Sickles	x				
Montgomery Street					
Broadway-Bush					
North Point Street					
Van Ness-Columbus			x		
Columbus-Embarcadero			x		
O'Farrell Street					
Gough-Mason *	x				
Mason-Market	x				
Oak Street					
Stanyan-Divisadero *	x		x		
Divisadero-Laguna	x		x		x
Laguna-Franklin					x
Ocean Avenue					
19th Ave-Miramar *	x				
Miramar-I-280	x				
Pine Street					
Market-Kearny	x				
Kearny-Leavenworth	x				
Leavenworth-Franklin	x				
Franklin-Presidio	x				
Potrero Avenue					
Division-21st St	x			x	
21st St-Army	x			x	
Skyline Drive					
Sloat-City & County limit					
Sloat Boulevard					
Skyline-J.Serra					
Stanyan Street					
Fulton-Turk					
Sutter Street					
Market-Mason *	x				
Mason-Gough	x				
Gough-Divisadero	x		x		
Turk Street					
Market-Hyde	x				
Hyde-Gough	x				

Street Name	Land Use	Speed Limit	Major Cross Street	Change In Volume	Free-way Ramp
Hyde-Gough	x				
Gough-Divisadero	x				
Divisadero-Stanyan			x		
Van Ness Avenue					
Lombard-Washington		Sig.	Syst.	Change	
Washington-GoldenGate Av *	x				
Golden Gate Ave-13th St *					x
13th St-Army					x
Washington Street					
Kearny-Drumm					
West Portal Avenue					
Sloat-Ulloa					

* indicates change in segment boundary.

CMP NETWORK - FREEWAYS

Rationale for Segmentation

Freeway	Split	Off-ramp	On-ramp
I-280			
C & C limit- U.S. 101	x		
101/280 -6th/Brannan	x		
U.S.101			
C & C limit- I-280	x		
I-280- I-80	x		
I-80- Fell/Laguna	x		
I-80			
U.S. 101- Fremont		x	
Fremont- Treasure Island		x	

Table II
Rationale for Changes to Arterial Segmentation
Since 1991

Third Street	Eliminated Fairfax Street as a break point. Evans Avenue is the new break point because of the change in speed limit and because Evans is a major cross street.
Alemaný Boulevard	Lyell Street is a necessary break point because of a speed limit change.
Army Street (César Chávez)	Because of the size of the U.S. 101 interchange at Army Street circle, a break point was established on each side of it. One is at Kansas Street and a second is at Bryant Street.
Bayshore Boulevard	Industrial is a necessary break point because of nearby off and on-ramps.
Bush Street	Gough is the best divider to break Bush into two segments because land use changes occur at Gough and because it is a major cross street.
Duboce Avenue	Folsom Street was eliminated as a break point and replaced with Mission Street, because of the presence of on and off ramps to 101.
Evans Avenue and Fremont Street	The 1991 intermediate segment limits could not be justified and were eliminated (no apparent change in traffic flow conditions)
Fulton Street	Arguello was identified as an intermediate segment limit because it is a major cross street and because of a speed limit change.
Harrison Street	Eliminated 2nd Street and substituted First Street is the first break point because of the I-80 on-ramp.
Junipero Serra Boulevard	The first segment boundary is 19th Avenue instead of Holloway, as justified by the change in speed limit and also because 19th Avenue is a major cross street.
Lombard Street	Eliminated intermediate segment boundaries because land uses and traffic conditions are uniform along this street.
Market Street	Established a new segment boundary at Clipper because of a change in grade on each side of Clipper. Eliminated unjustified breaks at Danvers, Sanchez and Gough.
Mission Street	Eliminated intermediate boundaries between 14th and Army and between Army and Ocean to better reflect land use.
O'Farrell Street	Eliminated intermediate segment boundaries at Van Ness, Leavenworth and Taylor, which created segments too short for accurate measurement. Mason is the new break point because of land use changes.
Van Ness Avenue	Added Golden Gate Avenue as an intermediate segment boundary because of land use changes (start of the Civic Center area).



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January 10, 2007

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Deputy Director for Planning
San Francisco Transportation Authority
100 Van Ness Avenue, 26th floor
San Francisco, CA 94102

RE: San Francisco CMP Segment Modification

Dear Tilly:

Thank you for the letter dated January 4, 2007 regarding CMP monitoring on Brannan Street. After reviewing your letter and the CMP monitoring map for the area, MTC supports the proposed changes to make monitoring on Brannan in this area consistent with SFCTA's standard CMP segment definitions while continuing to monitor Brannan Street consistent with overall CMP guidance.

MTC expects monitoring on Brannan will take place on Brannan from Division to 6th Street and from 6th Street to 3rd Street effective spring 2007. Please let me know if there are any questions.





Yours truly,

Doug Johnson

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cc: Sean Co, MTC
Valerie Knepper, MTC
Doug Kimsey, MTC



-  Existing Brannan Street segment from Division to 9th
-  New Brannan Street segment from Division to 6th
-  Existing Brannan Street segment from 6th to 5th
-  New Brannan Street segment from 6th to 3rd

Two-way street segments are represented by two parallel lines.



Proposed new CMP monitoring segments
San Francisco County
Congestion Management Program

0 0.125 0.25 0.5 Miles

This map is intended for planning purposes only.

Map Produced: 11/27/2006 KNS



APPENDIX 2

Infill Opportunity Zone Resolution

1 [Resolution establishing Infill Opportunity Zones for Congestion Management Planning in the
2 City and County of San Francisco under California Government Code Section 65088.]

3
4 **Resolution establishing Infill Opportunity Zones for Congestion Management Planning**
5 **in the City and County of San Francisco under California Government Code Section**
6 **65088.**

7
8 WHEREAS, State Senate Bill 1636 ("SB 1636") allows local jurisdictions to designate
9 eligible areas as Infill Opportunity Zones ("IOZs") so that Congestion Management Program
10 ("CMP") requirements better support local land use and transportation policies, pursuant to
11 California Government Code Section 65088.4; and

12 WHEREAS, The San Francisco County Transportation Authority ("Authority") and the
13 City and County of San Francisco ("City") seek to reform the City's approach to analyzing
14 transportation impacts pursuant to the California Environmental Quality Act ("CEQA"), to
15 better support local land use and transportation polices, by measuring Automobile Trips
16 Generated ("ATG") rather than Level of Service ("LOS"); and

17 WHEREAS, The adoption of an IOZ in the City would provide strong support for the
18 Authority and the City's effort to replace LOS with ATG for CEQA transportation impact
19 purposes; and

20 WHEREAS, The adoption of an IOZ in the City would allow the Authority, as
21 Congestion Management Agency ("CMA"), to better support the City's Transit First Policy,
22 land use planning efforts, compact land use pattern, and multimodal transportation system
23 through CMP practices; and

24 WHEREAS, SB 1636 requires that any IOZ designation be made no later than
25 December 31, 2009; and

1 WHEREAS, The IOZ designation is consistent with the San Francisco General Plan
2 ("General Plan") because: (1) it will further the goals of the City's Transit First Policy as
3 articulated in General Plan; (2) it will directly support policy objectives of the General Plan,
4 including, but not limited to, Objectives 1, 2, 3, 10, 11, 12, 14, 15, 18, and 19 of the
5 Transportation Element; and (3) it will compliment City efforts to promote infill housing and
6 mixed-use commercial developments in proximity to multimodal transportation infrastructure;
7 and

8 WHEREAS, The Board of Supervisors finds the City to be eligible for IOZ designation
9 in the area identified by the Authority in the IOZ Map ("IOZ Map") on file with the Clerk of the
10 Board of Supervisors in File No. 091335 , which is hereby declared to be a part of this
11 motion as if set forth fully herein; and

12 WHEREAS, The Board of Supervisors' eligibility findings are supported by analysis
13 conducted by Authority staff, which is on file with the Clerk of the Board of Supervisors in File
14 No. 091335 , and which is hereby declared to be a part of this motion as if set forth fully
15 herein; now, therefore, be it

16
17 RESOLVED, That the Board of Supervisors finds that the IOZ designation is, on
18 balance, consistent with the General Plan; and be it

19 FURTHER RESOLVED, That the eligible portion of the City identified by the Authority
20 in the IOZ Map is hereby designated an IOZ within the meaning of California Government
21 Code Section 65088.



City and County of San Francisco

Tails
Resolution

City Hall
1 Dr. Carlton B. Goodlett Place
San Francisco, CA 94102-4689

File Number: 091335

Date Passed: December 08, 2009

Resolution establishing Infill Opportunity Zones for Congestion Management Planning in the City and County of San Francisco under California Government Code Section 65088.

December 08, 2009 Board of Supervisors - ADOPTED

Ayes: 11 - Alioto-Pier, Avalos, Campos, Chiu, Chu, Daly, Dufty, Elsbernd, Mar, Maxwell and Mirkarimi

File No. 091335

I hereby certify that the foregoing Resolution was ADOPTED on 12/8/2009 by the Board of Supervisors of the City and County of San Francisco.

18 December 2009
Date Approved

Angela Calvillo
Angela Calvillo
Clerk of the Board

[Signature]
Mayor Gavin Newsom



Infill Opportunity Zones

San Francisco Eligible Areas Analysis

November 2009

State Senate Bill 1636 (Figueroa) allows local jurisdictions to designate Infill Opportunity Zones (IOZs). Within a designated IOZ, the Congestion Management Agency (CMA) must use an alternative to automobile level of service (LOS) standards for CMP purposes.

SB 1636 requires that any IOZ designation(s) be made no later than December 31, 2009. We are advised by the City Attorney's office that this action would be taken by the Board of Supervisors.

ELIGIBLE GEOGRAPHIC AREA

Per SB 1636, a location must meet all of the following criteria to be IOZ-eligible:

1. The area must be zoned for compact residential or mixed use development;
2. The area must be located within a specified distance of certain types of transit service;
3. The area must be located in a county with a population of 400,000 or more; and
4. IOZs can only be designated in areas where infill development is consistent with the local jurisdiction's general plan and any applicable specific plan.

San Francisco meets the county-level population requirement. The General Plan (Housing Element) recognizes the role of infill development in addressing the city's housing needs, thus satisfying the fourth requirement.

Based on the first two requirements, however, the entire city is not eligible to be designated as an IOZ.

Transit Requirement: SB 1636 requires that IOZs be well served by transit; specifically, IOZ areas must be within:

- 300 feet of a bus rapid transit (BRT) corridor;
- 1/3 mile of a rail transit station;¹
- 1/3 mile of a ferry terminal served by bus or rail transit; or
- 1/3 mile of an intersection of at least two major bus routes.

The legislation does not define "major bus routes." The recommended IOZ area uses the legislation's definition of qualifying "transit service" to determine "major" bus routes: service must operate with headways less than 15 minutes for at least 5 hours on weekdays. The recommended San Francisco IOZ area includes zones within 1/3 mile radius of these intersections, combined with radial areas applied to BART stations, Caltrain stations, Muni rail stops, and ferry terminals. Finally, the recommended San

¹ SB 1636 also allows a "future" rail transit station to satisfy this requirement, but such a station must have advanced into the construction phase with programmed operational funding for frequent service.

Francisco IOZ includes a 300-foot buffer along each side of BRT corridors (considered as the Transit Effectiveness Project (TEP) *Rapid Network* bus corridors).²

Zoning Requirement: SB 1636 requires that IOZs be zoned to allow new “compact” residential or mixed use (including residential) development. San Francisco’s existing high land use densities permit an interpretation that qualifies any area zoned to allow residential use either As-of-Right or as Conditional Use as IOZ-eligible in terms of the zoning requirement.

Most zoning classifications in San Francisco allow residential development as-of-right. Dwelling units are permitted in all residential and residential-commercial districts, and in any districts described by a combined classification (such as RM-2/NC-1, mixed residential and neighborhood commercial). With few exceptions, housing is also permitted throughout South of Market’s mixed-use districts and all of those in Chinatown. Downtown and commercial zoned districts also allow for residential development. In the neighborhood commercial districts, housing is allowed but particularly encouraged above ground floor for new construction projects

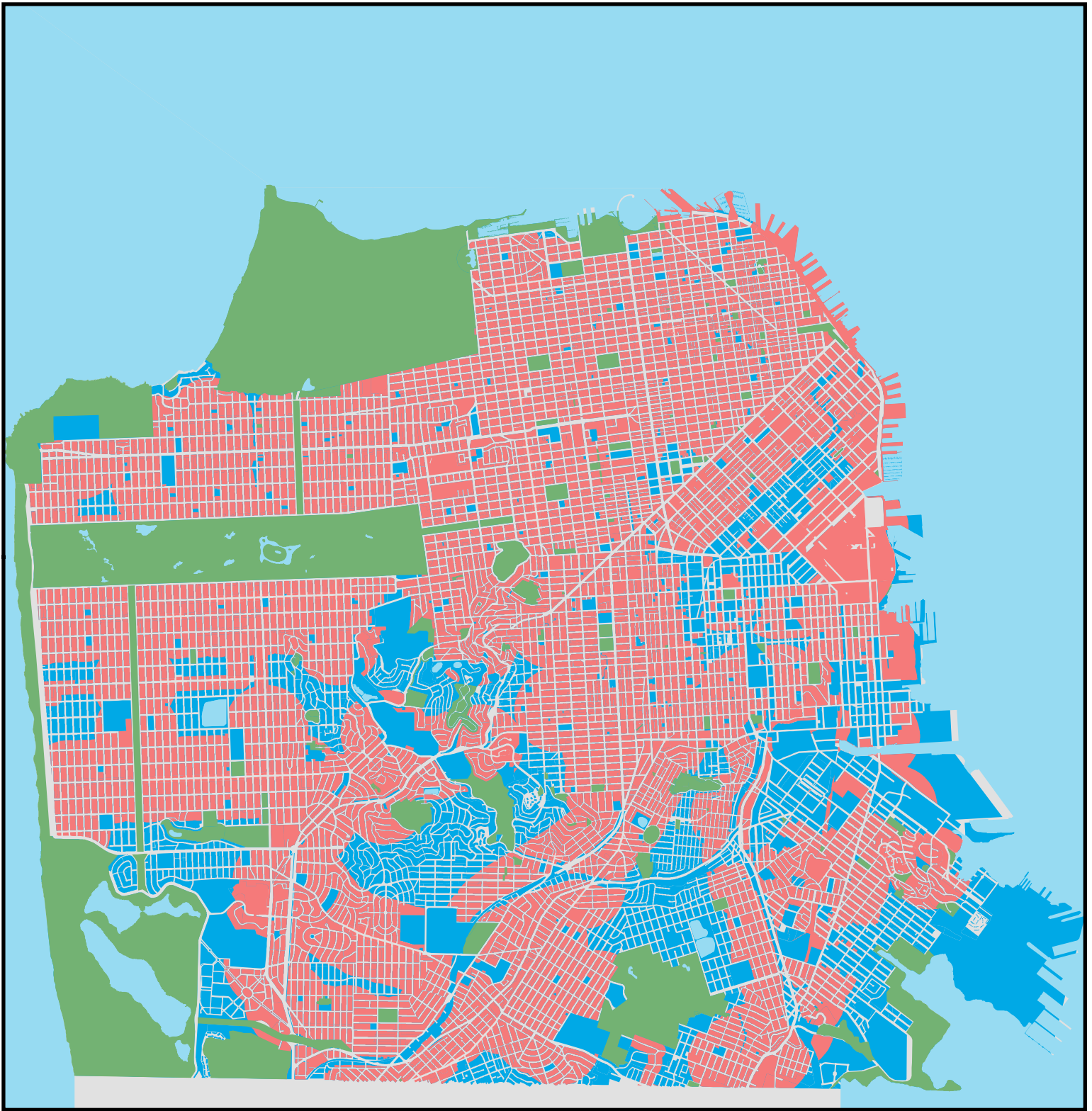
Residential development in industrial districts and the South of Market’s Service and Secondary Office (SSO) district requires a Conditional Use Permit. Residential and mixed uses are also conditionally permitted in areas classified as M-1 and M-2, describing light and heavy industrial land uses, respectively.




Using Geographic Information Systems (GIS) data reflecting currently-adopted zoning controls and transit network attributes, we determined which portions of San Francisco meet both the zoning and transit requirements. The resulting map, attached, identifies the recommended (i.e., all eligible) IOZ areas in San Francisco. (Treasure Island is omitted because it does not meet the transit requirement.)

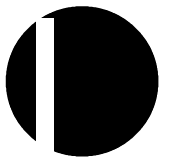
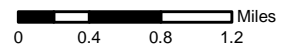
SB 1636 also requires that a development project be completed within a designated IOZ within four years of such designation; otherwise, the IOZ terminates.

Attachment – Recommended San Francisco Infill Opportunity Zone

² BRT is defined as bus service that includes at least four of ten attributes specified in the statute.



-  Parks
-  Eligible Infill Opportunity Zone
-  Ineligible Areas



This map is intended for planning purposes only.

APPENDIX 3

Traffic Monitoring (Speed and Travel Time Reliability) Methodology & Results

KEY TOPICS

- LOS Standard and Exempt Facilities
- CMP Network Changes
- Methodology
- Travel Speed Results
- LOS F Segments
- Travel Time Reliability Results
- Future Monitoring Considerations

The San Francisco County Transportation Authority (Transportation Authority) has updated its Congestion Management Program (CMP) every two years since 1991. The Transportation Authority monitors roadway performance with Level of Service (LOS) along its CMP network, which includes all state highways, principal arterials and several other roads as defined in previous LOS monitoring efforts. The Transportation Authority ensures that LOS measurement methods used by its contractors, Caltrans, or other agencies involved in monitoring the CMP network are consistent with State law.



A3.1 LOS Standards and Exempt Facilities

LOS E was the adopted standard in the initial (1991) CMP monitoring. Since 1991, CMP monitoring has been conducted biannually to ensure that non-exempt facilities within the CMP network are operated at LOS E or better.

The Transportation Authority is mandated to prepare a deficiency plan or monitoring follow-up, depending on the applicable exemption, to improve the performance of non-exempt facilities operated at LOS F. The criteria to qualify for the exemption are:

- Facilities that were already operating at LOS F at the time of baseline monitoring, conducted to develop the first CMP in 1991, are legislatively exempt from the LOS standards.
- CMP segments that are within a designated Infill Opportunity Zone (IOZ) are also exempt from LOS standards.

For LOS monitoring purposes, the CMP segments are categorized by exempt or non-exempt status:

- **Exempt:** segments which qualify for the exemption as detailed above.
- **Non-exempt:** all other segments. If a non-exempt segment fails for three consecutive CMP cycles, it is classified as deficient.

Since 2005, speed monitoring has included the exempt facilities in addition to the rest of the CMP network. Figure A3-1 and Figure A3-2 show segments that are exempt from LOS standards because they were found to be LOS F in the inaugural CMP cycle, while Figure A3-3 shows the portions of the CMP network that are within San Francisco's Infill Opportunity Zone and are therefore exempt from LOS standards as well.

Figure A3-1. Segments Exempt in AM Peak Due to Being at LOS F in the Inaugural Cycle



Figure A3-2. Segments Exempt in PM Peak Due to Being at LOS F in the Inaugural Cycle



Figure A3-3. Segments Exempt Due to Being within an Infill Opportunity Zone



A3.2 CMP Network Changes

The CMP network is described in detail in Chapter 3 of the main report. There are no changes to the CMP network from 2021 to 2023.

A3.3 Methodology

Since the 2013 CMP update, automobile LOS monitoring was conducted using commercial speed data from INRIX where available, and floating car runs were made to collect data for all other CMP segments for which INRIX data coverage was insufficient. In the 2013-2017 cycles, INRIX provided travel time data at one-minute intervals on a unique set of roadway segments called Traffic Message Channels (TMCs). Since the 2019 cycle, INRIX has provided data at a spatially finer-grained level (XD segments) and the TMC-based travel time data were discontinued, so the TA switched to using XD-based travel time data. Consistent with the processing method used in the previous cycles, the XD-based speeds were aggregated to CMP segments spatially and the peak periods temporally. LOS was assigned based on the average speed observed in the AM and PM peak periods using both 1985 and 2000 Highway Capacity Manual (HCM) methodologies. Section A3.3.4 provides a detailed description of data processing steps.

The 1985 Highway Capacity Manual (HCM) methodology has been adopted since the baseline monitoring cycle. It is necessary to maintain 1985 HCM for historical comparisons, identifying exempt segments, and monitoring potential network deficiencies. Since 2009, all the arterial segments have also been evaluated using the HCM 2000 classification. Therefore, both the HCM 1985 and 2000 results are presented below.

For freeways, only HCM 1985 LOS was calculated, as the HCM 2000 methodology requires traffic density information for all unique freeway segments and ramps. Collection of comprehensive freeway traffic densities is beyond the scope of the CMP monitoring effort.

In addition to LOS, the buffer time index (BTI) which reflects auto travel time reliability was introduced in the 2021 cycle. The idea behind the metric is that travel times vary significantly during different times of the day and from day to day, and travelers remember these unexpected long delays experienced during their commutes and would therefore budget extra (i.e. buffer) time for the trip in order to reach destination on time. The buffer time here is calculated as the difference between the 95th percentile travel time and the average travel time. Buffer time index is the buffer time divided by the average travel time. It indicates the amount of extra time required to be on-time 95 percent of the time, or in other words, late only one day per month (approximated as 20 20 working days).

A3.3.1 MONITORING PERIOD

This section summarizes the monitoring days and the conditions that may affect the regular traffic pattern during the monitoring period. INRIX data for every Tuesday, Wednesday, and Thursdays in the months of April and May 2023 were utilized to calculate the average speed of each CMP segment, leaving 26 days within the monitoring period. The morning (AM) and afternoon (PM) peak periods were defined as 7:00 a.m. – 9:00 a.m. and 4:30 p.m. – 6:30 p.m. respectively.

These monitoring periods were also used for transit speed monitoring (see Appendix 6).

Public Holidays and School Breaks

There were no public holidays within the monitoring period (Tuesdays, Wednesdays, and Thursdays in April and May 2023). The San Francisco Unified School District (SFUSD) was in session during the monitoring period.

Special/Construction/Weather Events

No INRIX data during the monitoring period were removed from analysis due to special, construction, or weather events.

A3.3.2 COMMERCIAL SPEED DATA

Since the adoption of the 2009 CMP update, there has been a proliferation of archived commercial speed data. This data is collected through real-time GPS monitoring of a variety of sources such as delivery vehicles, navigational devices, and highway performance monitoring systems, and obtained from third-party vendors like INRIX.

As part of the 2011 CMP update, the Transportation Authority explored the reliability of this new data source by comparing results computed from this source to those computed from floating car runs. The analysis found that, although the INRIX data speeds were somewhat higher, on average, than the floating car speeds, the difference was within the typical range of variation for floating car results and that commercial speed data and floating vehicle data were equally acceptable for meeting CMP legislative requirements. For more details about the pros and cons of using commercial speed data, refer to the 2013 CMP report.

In 2013, MTC contracted with INRIX to obtain region wide commercial speed data and has made the data available to the Congestion Management Agency (CMA) and other local governments free of charge for planning and monitoring purposes. The data available from INRIX was in the form of traffic message channel (TMC) links.

In 2019, MTC renewed the contract with INRIX with a major change that the speed data would be on the XD segments, whose length are typically much shorter than those of TMC segments. Due to this segmentation change, the aggregated CMP speeds from XD links and TMC links were found to be inconsistent even with the same underlying

data sources. To make an “apples-to-apples” comparison, both 2017 and 2019 speeds based on XD speeds were calculated and reported, and the congestion trends from 2017 to 2019 were derived from them.

Since 2019, the CMP reports have used the XD-based speed data to derive and report auto LOS and reliability metrics.

A3.3.3 SUPPLEMENTAL TRAVEL TIME RUNS

Floating car surveys were conducted on CMP segments with insufficient INRIX speed coverage. The surveys were conducted using conventional methodologies. Drivers were instructed to follow road rules including the speed limit, traffic signals and not block intersections. GPS coordinates were recorded as the floating car travels along the CMP segment. The temporal aggregation of multiple floating car runs on the corresponding CMP segment was performed in the same manner as for the INRIX data, explained in Section A3.3.4 below.

A3.3.4 PROCESSING

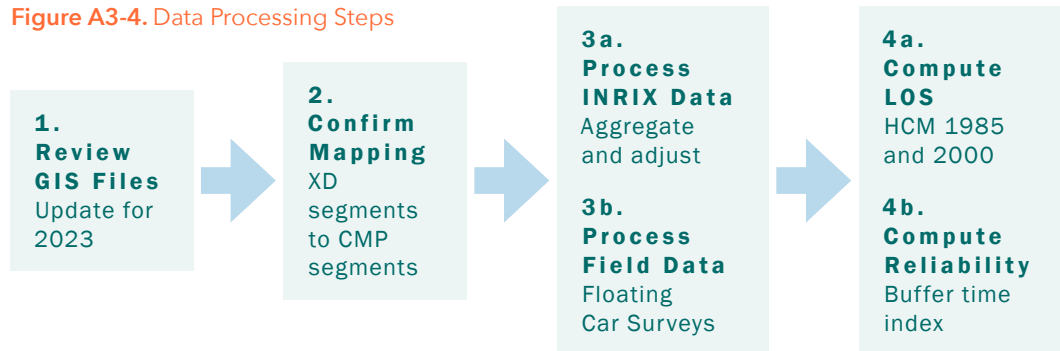
The data were processed to obtain automobile speed, LOS, and reliability for each CMP segment during the morning and afternoon peak periods. The data processing consists of four steps as shown in Figure A3-4. The following provides more details on the data processing procedure:

- The GIS shapefile was reviewed to prepare the base map of the CMP network for conflating the XD links against CMP segments;
- In this step, INRIX XD links were mapped to CMP segments to establish a relationship between XD links and CMP segment. In the cases where the ends of the CMP segment did not align with the ends of the XD segments, travel time was interpolated linearly by using the overlapping portion;
- During data cleaning, INRIX data points based on historical data or that can be affected by the conditions mentioned earlier in Section A3.3.1 were dropped and were not used in the LOS and reliability analysis. With the floating car data, the first and last timestamps from the GPS readings when entering and exiting the CMP segment were identified and the CMP travel time was calculated;

- In addition, in cases where multiple XD links spanned a single CMP segment, the travel times were summed and then aggregated spatially to obtain the required average peak period speeds by CMP segment. To ensure the aggregated speed was representative of the traffic condition on the whole CMP segment, a minimum spatial coverage requirement was applied. Based on the remaining aggregated one-minute speeds, the average and 5th percentile speeds for each CMP segment during the AM and PM monitoring periods were calculated.
- Finally, LOS and BTI were calculated. LOS was assigned based upon the peak period speed. For the methodology of LOS assignment, please refer to the section below. BTI was derived as

$$BTI = 100 \times \frac{95\text{th percentile travel time} - \text{average travel time}}{\text{average travel time}} = 100 \times \left(\frac{\text{average speed}}{5\text{th percentile speed}} - 1 \right)$$

Figure A3-4. Data Processing Steps



A3.3.5 LOS ASSIGNMENT

This section discusses the methodology for assigning a LOS (A to F) to each CMP segment for both morning and afternoon peak periods. The LOS assignments for arterials and freeways are consistent with previous reporting periods and legislative requirements from the California Government Code. First, each CMP segment was classified as either an arterial or a freeway. The methodology slightly differs depending on this classification, as follows.

Arterials

LOS for arterial segments was assigned twice using both 1985 and 2000 Highway Capacity Manual (HCM) methodologies. Both methods required identifying the class of the street (HCM 1985 Class I, II or III; HCM 2000 Class I, II, III or IV). Class was determined according to the free flow speed of the road. For example, the free flow speed may be the average speed at 6am when traffic volumes are light and travel speeds are not influenced by interactions with other vehicles.

For the HCM 1985 and 2000, the classification of streets was taken from previous LOS monitoring reports. Then, by knowing the average travel speed in the morning and afternoon peak periods and the class of the street, the LOS could be assigned according to the HCM 1985 and HCM 2000 methodologies. Refer to Table A3-1 and Table A3-2 for the LOS look up tables.

Freeways

Freeways followed a similar methodology as arterials; however, it was not necessary to assign a class of freeway. The HCM-1985 method was used to calculate LOS for all freeway CMP segments. By knowing the average speed of the freeway in the morning and afternoon peaks, Table A3-3 was used to assign a LOS in each time period.

Table A3-1. Arterial LOS Assignment, HCM 1985

ARTERIAL CLASS	I	II	III
Range of Free Flow Speed (mph)	45 to 35	35 to 30	35 to 25
Typical Free Flow Speed (mph)	40	33	27
LEVEL OF SERVICE	AVERAGE TRAVEL SPEED (MPH)		
A	≥ 35	≥ 30	≥ 25
B	≥ 28	≥ 24	≥ 19
C	≥ 22	≥ 18	≥ 13
D	≥ 17	≥ 14	≥ 9
E	≥ 13	≥ 10	≥ 7
F	< 13	< 10	< 7

Source: Table 11-1, Highway Capacity Manual, 1985

Table A3-2. Urban Street LOS Assignment, HCM 2000

URBAN STREET CLASS	I	II	III	IV
Range of Free Flow Speed (mph)	55 to 45	45 to 35	35 to 30	35 to 25
Typical Free Flow Speed (mph)	50	40	35	30
LEVEL OF SERVICE	AVERAGE TRAVEL SPEED (MPH)			
A	> 42	> 35	> 30	> 25
B	> 34-42	> 28-35	> 24-30	> 19-25
C	> 27-34	> 22-28	> 18-24	> 13-19
D	> 21-27	> 17-22	> 14-18	> 9-13
E	> 16-21	> 13-17	> 10-14	> 7-9
F	≤ 16	≤ 13	≤ 10	≤ 7

Source: Exhibit 15-2, Highway Capacity Manual 2000 (U.S. Customary Units)

Table A3-3. Freeway Segments, HCM 1985

LEVEL OF SERVICE	DENSITY (PC/MI/LN)	SPEED (MPH)	V/C RATIO	SATURATION FLOW (PCPHPL)
A	≤ 12	≥ 60	0.35	700
B	≤ 20	≥ 55	0.58	1,000
C	≤ 30	≥ 49	0.75	1,500
D	≤ 42	≥ 41	0.90	1,800
E	≤ 67	≥ 30	1.00	2,000
F	> 67	< 30	-	-

Source: Adapted from Table 4-1, Special Report 209, HCM 1985

A3.4 Travel Speed Results

Speeds for the AM and PM peak for each CMP road segment from all CMP cycles can be found in Attachment A3-1 and Attachment A3-2. Attachment A3-3 presents the 2023 LOS monitoring results for all CMP segments. For arterials, the results are presented for both the 1985 and 2000 HCM methodologies. Table A3-4 presents summary statistics on the peak period speeds.

Table A3-4. 2023 CMP Average Travel Speed Results Summary Statistics

PEAK PERIOD	NUMBER OF SEGMENTS	AVERAGE SPEED (MPH)	STANDARD DEVIATION	MINIMUM SPEED	MAXIMUM SPEED
AM	245	17.6	9.8	6.5	63.5
PM	245	15.7	9.2	6.3	63.9

A3.5 LOS F Segments

Table A3-5 and Table A3-6 present the segments operated at LOS F (1985 HCM method) during the current cycle. As noted above, the Transportation Authority uses the 1985 HCM for calculating LOS when making historical comparisons to the baseline cycle.

Table A3-5. 2023 Roadway Monitoring Results – LOS F Segments (1985 HCM), AM Peak

NAME	FROM	TO	DIR.	AVE SPEED/ LOS (1991)	IOZ (YES/ NO)	STATUS / COMMENTS
Junipero Serra	Brotherhood	19th	N	-	Y	Exempt: Segment is within an IOZ and therefore does not constitute a deficiency.
Octavia	Market	Fell	N	-	Y	Exempt: Segment is within an IOZ and therefore does not constitute a deficiency.
US-101	County Line	Cortland	N	F	-	Exempt: Segment monitored at LOS F during the baseline monitoring and therefore does not constitute a deficiency.
US-101	Cortland	I-80	N	F	-	Exempt: Segment monitored at LOS F during the baseline monitoring and therefore does not constitute a deficiency.
US-101	I-80	Market	N	F	-	Exempt: Segment monitored at LOS F during the baseline monitoring and therefore does not constitute a deficiency.
I-80	Treasure Island	Fremont Exit	W	F	-	Exempt: Segment monitored at LOS F during the baseline monitoring and therefore does not constitute a deficiency.
I-80	Fremont Exit	US-101	W	-	-	Segment is partially in an IOZ. 1st Cycle LOS F: Segment requires follow-up monitoring per CMP procedures.
US-101	Market	I-80	S	F	-	Exempt: Segment monitored at LOS F during the baseline monitoring and therefore does not constitute a deficiency.

Table A3-6. 2021 Roadway Monitoring Results – LOS F Segments (1985 HCM), PM Peak

NAME	FROM	TO	DIR.	LOS (1991)	IOZ (YES/NO)	STATUS / COMMENTS
1st St	Market	Harrison	S	F	-	Exempt: Segment monitored at LOS F during the baseline monitoring and therefore does not constitute a deficiency.
Junipero Serra	County Line	Brotherhood	N	-	Y	Exempt: Segment is within an IOZ and therefore does not constitute a deficiency.
Junipero Serra	Brotherhood	19th	N	-	Y	Exempt: Segment is within an IOZ and therefore does not constitute a deficiency.
Oak	Fillmore	Laguna	E	-	Y	Exempt: Segment is within an IOZ and therefore does not constitute a deficiency.
US-101	Cortland	I-80	N	F	-	Exempt: Segment monitored at LOS F during the baseline monitoring and therefore does not constitute a deficiency.
US-101	I-80	Market	N	F	-	Exempt: Segment monitored at LOS F during the baseline monitoring and therefore does not constitute a deficiency.
I-80	Treasure Island	Fremont Exit	W	F	-	Exempt: Segment monitored at LOS F during the baseline monitoring and therefore does not constitute a deficiency.
I-80	Fremont Exit	Market	W	F	-	Exempt: Segment monitored at LOS F during the baseline monitoring and therefore does not constitute a deficiency.
US-101	Market	I-80	S	F	-	Exempt: Segment monitored at LOS F during the baseline monitoring and therefore does not constitute a deficiency.
I-80	US-101	Fremont Exit	E	F	-	Exempt: Segment monitored at LOS F during the baseline monitoring and therefore does not constitute a deficiency.
I-80	Fremont Exit	Treasure Island	E	F	-	Exempt: Segment monitored at LOS F during the baseline monitoring and therefore does not constitute a deficiency.

A3.6 Travel Time Reliability Results

Auto travel time reliability represented by Buffer Time Index (BTI) was a new metric added in the 2021 monitoring cycle. Unlike LOS, which indicates the congestion condition based on average speed, BTI provides additional information on variability of travel times experienced by travelers over a certain period of time. It is useful in that travelers can budget extra amount of time in accordance with BTI to ensure on-time arrival 95 percent of time.

Table A3-7 presents summary statistics on the peak period BTI for the current cycle. During the 2023 monitoring cycle, the overall average travel time reliability was slightly worse in the AM peak period than the PM peak period. On average, travelers needed to allocate an additional 28% and 26% of their average travel time in the AM and PM peaks to ensure 95% on-time arrival (an increase from 22% and 19% respectively for 2021). Attachment A3-4 presents the reliability monitoring results for all segments in the CMP network.

Table A3-7. 2023 CMP Travel Time Reliability (Buffer Time Index) Results Summary Statistics

PEAK PERIOD	NUMBER OF SEGMENTS	AVERAGE (%)	STANDARD DEVIATION (%)	MINIMUM (%)	MAXIMUM (%)
AM	245	28	17	6	174
PM	245	26	18	6	225

Attachment A3-1. CMP Segments Average Speeds (AM Peak), 1991 - 2023

NAME	FROM	TO	TRAVEL DIRECTION	LENGTH (MI)	AVE SPEED 91	AVE SPEED 92/3	AVE SPEED 95	AVE SPEED 97	AVE SPEED 99	AVE SPEED 2001	AVE SPEED 2004	AVE SPEED 2006	AVE SPEED 2007	AVE SPEED 2009	AVE SPEED 2011	AVE SPEED 2013	AVE SPEED 2015	AVE SPEED 2017 (TMC)	AVE SPEED 2017 (XD)	AVE SPEED 2019	AVE SPEED 2021	AVE SPEED 2023
1st St	Market	Harrison	S	0.48		15.1				12.5	11.2	20.8	16.3	14.2	13.8	18.5	11.8	12.8	13.4	11.6	17.0	14.6
2nd St	Brannan	Market	N	0.72								10.1	10.8	12.2	13.9	11.1	9.7	9.6	10.4	8.8	14.3	11.4
	Market	Brannan	S	0.72								14.3	18.6	16.3	20.8	9.6	11.9	10.6	10.5	10.9	14.1	13.2
3rd St	Jamestown	Evans	N	1.62		25.4				23.5		17.9	20.5	24.6	23.9	18.1	17.1	15.3	15.3	12.8	15.6	14.6
	Evans	Terry Francois	N	2.36	10.3	24				23.6		24.7	23.1	28.4	27.6	20.9	17.5	16.2	16.9	13.6	18.1	17.0
	Terry Francois	Market	N	1.05	12.1	12.1	15.3		10.8	9.2	6.2	8.1	9.7	20.0	15.1	13.6	12.1	10.6	10.7	10.9	14.4	10.1
	Terry Francois	Evans	S	2.36	10.3	24.1				23.8		20.2	28.9	28.6	27.3	21.7	18.7	17.5	17.8	14.0	18.8	18.4
4th St/Stockton	Evans	Jamestown	S	1.62		22.3				20.9		23.7	21.9	23.2	25.4	19.2	18.4	15.9	15.8	11.3	15.3	14.8
	O'Farrell	Harrison	S	0.56		11.6	8.1	14.6				11.3	9.4	13.4	17.0	13.6	13.9	11	10.8	10.4	13.1	10.6
5th St	Harrison	Channel	S	0.60									16.0	13.8	16.8	12.8	11.4	7.6	8.7	9.7	13.5	11.7
	Brannan	Market	N	0.72	7.9	10.5	10.7	12.1	10.5	11.8	8.6	10.9	11.8	14.7	16.3	9.5	10.0	8.7	10.7	10.1	13.1	11.0
6th St	Market	Brannan	S	0.72	7.9	11.6				9.9	10.6	11.8	11.4	19.3	16.1	11.7	10.8	11.4	11.2	10.6	14.1	12.8
	Brannan	Market	N	0.72		13.8				4.7	5.5	12.6	10.3	11.2	15.7	13.6	10.6	10.4	10.6	10.5	14.7	10.0
7th St	Market	Brannan	S	0.72		22.4				10	8.3	13.6	14.2	15.1	16.5	17.5	14.6	12.3	12.4	11.2	21.3	13.9
	Brannan	Market	N	0.72	8.9	13.9			14.2		6.8	13.4	19.1	18.9	19.3	15.4	10.8	8.6	8.9	10.1	13.2	10.0
8th St	Market	Bryant	S	0.60		17.1			17.7		15.9	16.6	18.7	15.0	17.9	15.9	13.5	12	12.2	12.6	12.8	11.6
9th St	Brannan	Market	N	0.72	9.9	12.5	13.3			10.3	9.6	14.2	13.0	11.4	13.8	14.4	10.2	9.1	9.2	10.0	10.2	9.2
10th St	Market	Brannan	S	0.73	12.1	20.5				16.3	9.7	17	26.1	21.9	21.4	23.8	18.1	16.5	17.3	16.4	20.9	15.7
16th St	Market	Mission	E	0.74								19	18.5	12.1	13.7	16.3	13.1	9.3	9.8	7.8	15.1	12.0
	Mission	Potrero	E	0.67								15.9	13.6	14.1	13.6	14.7	13.3	10.2	10.9	10.7	15.0	13.1
	Potrero	Mission	W	0.67								13.4	11.5	13.5	12.1	14.1	13.0	11.8	12.0	12.0	14.4	13.4
	Mission	Market	W	0.74								12.9	13.7	13.4	12.7	16.0	13.3	10.5	11.6	10.9	13.0	14.3
19th Ave/Park Presidio	Junipero Serra	Sloat	N	1.25		19.2			23.1			22.1	16.4	18.2	16.9	15.7	17.6	17.8	19.3	17.2	22.6	18.8
	Sloat	Lincoln	N	2.13	11.1	19.2			15			17.9	18.6	13.8	15.4	17.0	13.1	13.4	13.7	15.7	20.9	15.5
	Lincoln	Lake	N	1.85		21.9			19.7			19.9	20.4	19.9	22.1	24.5	21.7	19.9	20.0	19.2	27.0	24.4
	Lake	US-101	N	1.18		38.8				28.6		34.7	44.0	45.3	43.6	49.6	37.4	45.2	44.4	43.7	42.3	44.3
	US-101	Lake	S	1.26		38.3				47.2		42.2	40.3	40.7	24.4	42.9	39.7	32.1	35.2	26.9	47.0	40.1
	Lake	Lincoln	S	1.85		20.9			22			25.1	26.1	26.3	28.1	26.4	22.8	22	22.1	21.2	27.7	22.0
	Lincoln	Sloat	S	2.13	11.1	17.2			18.4			21.8	22.2	19.2	19.3	17.8	17.4	18.1	18.9	18.8	21.2	14.8
Alemany	Sloat	Junipero Serra	S	1.25		20.2			21.2			20.2	17.2	21.6	23.6	23.8	23.2	24.9	30.1	27.1	28.1	25.7
	Junipero Serra	Lyell	E	2.95		25.6				20		20.9	21.5	28.3	23.2	23.0	20.0	16.5	16.7	18.5	24.4	22.1
	Lyell	Bay Shore	E	1.59		28.5				19		23.7	28.5	26.1	28.5	29.7	22.3	21.3	20.1	21.3	29.8	25.6
	Bay Shore	Lyell	W	1.57		35.4				28.4		37.5	25.4	30.7	28.1	29.8	31.2	28.2	29.4	27.2	28.2	29.5
Bay	Lyell	Junipero Serra	W	3.03		25.6				15.1		19.1	21.4	25.3	21.4	25.9	22.4	15.3	15.0	17.3	21.1	20.0
	Van Ness	Embarcadero	E	1.07	12.7	22.4				16.8		19.7	21.0	18.9	14.1	21.3	14.8	13.8	14.5	15.4	22.8	17.7
Bayshore	Embarcadero	Van Ness	W	1.07	12.7	19.7				22.8		18.3	19.6	19.3	20.1	20.6	17.1	16	16.5	15.4	19.1	16.8
	County Line	Industrial	N	2.27		20.9				25.3		18.4	26.2	17.4	19.1	13.9	10.8	12.3	11.5	12.0	21.9	15.7
	Industrial	Cesar Chavez	N	0.83		20.2				14.8		11.2	19.0	17.5	12.6	15.8	16.2	15.1	13.4	11.1	17.9	15.9
	Jerrold	Industrial	S	0.80		21				17.5		17.6	29.9	25.4	19.4	22.1	24.4	19.3	23.2	19.0	23.1	20.0
Beale/Davis	Industrial	County Line	S	2.26		27.4				23.3		25.7	30.1	27.8	24.1	24.5	22.5	19.3	19.2	17.7	24.1	20.6
	Clay	Mission	S	0.32		11.3	10	16.6	16.6			15.6	14.1	12.8	12.3	8.8	9.2	9.3	11.4	9.7	14.2	11.6

NAME	FROM	TO	TRAVEL DIRECTION	LENGTH (MI)	AVE SPEED 91	AVE SPEED 92/3	AVE SPEED 95	AVE SPEED 97	AVE SPEED 99	AVE SPEED 2001	AVE SPEED 2004	AVE SPEED 2006	AVE SPEED 2007	AVE SPEED 2009	AVE SPEED 2011	AVE SPEED 2013	AVE SPEED 2015	AVE SPEED 2017 (TMC)	AVE SPEED 2017 (XD)	AVE SPEED 2019	AVE SPEED 2021	AVE SPEED 2023
Brannan	Division	6th	E	0.54									15.7	13.8	11.7	20.3	16.2	18.9	13.5	11.8	15.8	13.8
	6th	3rd	E	0.51									21.8	15.8	14.7	19.3	13.2	10.8	11.3	10.1	15.8	14.3
	3rd	6th	W	0.52									15.9	17.0	12.8	20.4	14.4	12.4	13.2	13.6	16.6	15.3
	6th	Division	W	0.54									16.3	16.9	14.1	22.9	15.9	12.2	11.6	10.3	13.8	13.3
Broadway	Gough	Larkin	E	0.36		19.2			9	10.6	12.3	11.4	14.7	15.1	16.3	8.8	11.6	10	11.5	10.9	17.1	13.0
	Larkin	Powell	E	0.55		22.5			15.1	16.6	16.3	36.8	18.2	32.8	23.2	14.0	8.4	21.5	12.8	12.0	33.7	17.2
	Powell	Montgomery	E	0.35		16.8			8	10.9	11.8	13.9	15.4	20.1	15.8	11.4	11.2	8.2	12.4	11.5	18.2	13.3
	Montgomery	Embarcadero	E	0.35		11.2	9.4	15.1	12.2	11.6	8.8	10.8	11.3	13.9	15.3	11.3	9.9	8.1	11.7	10.2	17.9	14.2
	Embarcadero	Montgomery	W	0.35		17.7			14.8	11.2	12.1	17	17.5	19.9	17.1	12.7	17.1	10.8	13.3	10.5	14.7	14.0
	Montgomery	Powell	W	0.35		15.2			10	8.9	13.5	14.5	11.5	13.3	11.7	11.1	11.2	9.2	11.7	11.6	15.3	14.2
	Powell	Larkin	W	0.55		35.6			16	20	16.3	34.1	34.6	32.9	31.6	27.8	33.1	31.3	25.3	21.1	30.9	30.7
	Larkin	Gough	W	0.36		10.6	11.2	12.9	15.2	17.1	14.4	14.4	17.9	19.5	15.0	11.6	8.8	15.1	16.2	15.7	14.8	13.0
Brotherhood	Junipero Serra	Alemanya	E	0.43									21.3	25.8	29.2	28.7	23.0	24.4	23.3	22.3	24.9	23.5
	Alemanya	Junipero Serra	W	0.47									31.8	29.7	28.8	28.7	23.3	24	24.5	24.0	29.0	25.4
Bryant	Division	4th	E	0.99	7.7	12.2	13.2		12.9	13.2		12.2	11.2	13.1	19.4	15.9	14.9	11.7	12.3	11.1	16.4	14.7
	4th	Embarcadero	E	0.77		21.8			14.4			18.3		21.2	18.9	21.5	16.6	12	12.5	11.7	16.4	13.9
Bush	Masonic	Gough	E	1.24		17.3				22.4		18.2	17.2	18.0	23.3	20.4	16.6	15.7	15.4	17.0	18.7	15.7
	Gough	Market	E	1.45	3.2	10.9	9.6	11.4	11.6	12.6	8.7	10.7	11.7	10.9	13.8	16.4	12.1	10.4	11.4	10.4	16.0	12.1
Castro/Divisadero	Market	14th	N	0.32		17.5				11.9	10.1	10.7	16	9.0	14.8	15.6	14.0	12.5	10.4	10.7	10.8	11.4
	14th	Geary	N	1.13	4.5	14				10.6	11.2	8.8	11.2	11.3	15.0	14.9	14.4	11.7	10	9.9	9.4	12.3
	Geary	Pine	N	0.27		10.8	7.7	7.5	7.4	7.3	8.4	7.1	6.1	11.1	8.1	13.0	10.3	7.9	9.4	8.8	12.6	9.7
	Pine	Geary	S	0.27		14.2				13.2	7.3	7.8	11.7	15.6	14.5	13.0	13.6	11.1	12.1	12.3	9.7	12.9
	Geary	14th	S	1.13		14.8				14	11.5	9.8	12.3	15.8	16.6	12.8	14.9	11.7	12.3	12.4	12.0	13.5
	14th	Market	S	0.32		11.9	10.4	13.3	14.2				10.3	16.4	9.9	16.0	15.0	12.5	11.6	12.0	11.4	15.0
Cesar Chavez	Guerrero	Bryant	E	0.76		19				14.3		16.6	17.2	18.8	17.0	17.4	12.7	12.6	13.6	13.3	18.3	12.0
	Bryant	Kansas	E	0.38		19.9				28.9		28.3	31.3	20.5	26.9	26.2	20.8	24.9	20.1	20.8	25.0	23.8
	Kansas	3rd	E	0.80		17.6				19.5		25	16.4	18.6	19.9	20.4	18.0	14.3	14.3	14.8	19.7	17.1
	3rd	Kansas	W	0.80		19.4				18.8		22.1	20.1	18.6	23.0	21.4	17.6	15	14.4	13.2	18.2	16.8
	Kansas	Bryant	W	0.38		17.7				31.9		30.1	26.2	23.5	25.3	22.8	20.4	19.8	17.5	17.1	19.3	19.9
	Bryant	Guerrero	W	0.75		19.6				16.2		19.3	16.0	13.8	14.8	15.2	13.1	9.4	10.3	9.6	13.2	13.9
Clay	Kearny	Davis	E	0.38	11.7	3.7			12.5	10.6	9.2	10.8	14.3	19.1	19.0	12.4	9.9	10.7	10.7	10.1	12.0	10.6
Columbus	Montgomery	Greenwich	N	0.67		14				14.9		13.3	14.3	14.9	12.6	13.3	12.4	11.6	12.0	10.7	13.9	13.5
	Greenwich	North Point	N	0.42		22.6				9.1	18.2		18.8	16.6	10.6	10.5	13.6	12.5	11.5	10.9	8.7	13.7
	North Point	Greenwich	S	0.42		18.6				16.9		15.9	12.5	18.7	18.4	13.4	12.8	11	11.0	9.3	14.4	14.5
	Greenwich	Montgomery	S	0.67		16.3				11.1	9.2	9.3	11.7	12.3	11.6	12.0	12.9	11.8	11.2	11.7	10.8	11.5
Doyle/Lombard/Richardson	County Line	SF Cemetery	E	1.16		45.2						27.3	38.3	42.7		32.3	25.4	30.8	43.6	45.8	55.9	51.6
	SF Cemetery	Lyon/Francisco	E	0.93		34.2						28.3	19.3	12.5		25.0	15.3	17.8	15.0	13.3	38.1	57.2
	Lyon/Francisco	Van Ness	E	1.29		22.2				13.7		20.9	21.2	20.8	19.2	19.8	19.0	18.6	17.7	17.6	24.5	18.1
	Van Ness	Lyon/Francisco	W	1.29		19.7				16.9		16.6	18.3	17.7	16.6	20.4	16.4	13.5	14.3	9.2	15.6	18.2
	Lyon/Francisco	SF Cemetery	W	0.96		47.7						31.4	40.3	37.8		37.5	32.3	46.1	39.9	37.8	43.6	37.5
	SF Cemetery	County Line	W	1.15		43.3						28.7	41.3	44.1		39.3	35.1	48.3	50.7	52.0	55.3	55.2
Drumm	Market	Washington	N	0.22		19.9				23		12.9	13.1	16.8	16.1	11.2	13.0	9	10.0	8.1	12.6	10.4
	Washington	Market	S	0.22		5.3	5.3			22		8.4	11.6	8.7	20.3	6.8	7.5	7	8.4	6.9	8.9	8.8

NAME	FROM	TO	TRAVEL DIRECTION	LENGTH (MI)	AVE SPEED 91	AVE SPEED 92/3	AVE SPEED 95	AVE SPEED 97	AVE SPEED 99	AVE SPEED 2001	AVE SPEED 2004	AVE SPEED 2006	AVE SPEED 2007	AVE SPEED 2009	AVE SPEED 2011	AVE SPEED 2013	AVE SPEED 2015	AVE SPEED 2017 (TMC)	AVE SPEED 2017 (XD)	AVE SPEED 2019	AVE SPEED 2021	AVE SPEED 2023
Duboce/Division	Market	Mission	E	0.35		7.7	9.1	3	8.8	5.5	5.8	12		9.7	16.6	19.6	13.3	9.2	9.5	8.4	15.5	10.8
	Mission	Potrero	E	0.66	9.9	12	11.5	10.4	12.6	13		15.1		13.8	23.5	12.7	13.7	11.3	16.5	11.5	18.8	18.1
	Potrero	Mission	W	0.66	9.9	17.1				11.3	5.8	12.7		12.8	18.0	11.8	13.5	11	14.4	13.6	15.6	15.0
	Mission	Market	W	0.35		10.7	11.7	9.4	13.5			14.7		14.6	14.1	16.6	11.2	8.4	8.6	8.0	12.3	10.9
Embarcadero	Townsend	North Point	N	2.16		21.2				14.5		12.3	22.4	21.1	20.4	17.5	16.0	13.2	14.4	14.9	18.2	14.4
	North Point	Townsend	S	2.16		15.2				13.8		16.6	17.3	13.2	14.1	16.1	14.3	13.2	14.3	12.9	17.7	14.3
Evans	Cesar Chavez	3rd	S	0.73		16.3				20.4		16.1	16.9	20.7	15.7	14.8	12.8	10.4	16.6	15.7	19.9	16.2
	3rd	Cesar Chavez	N	0.73		19.9				17		28.4	24.8	22.5	15.9	15.3	13.4	16.5	14.9	14.1	16.2	13.7
Fell	Gough	Market	E	0.29		11.6	12	4.3	8.1	7.6	6.1	7.7	8.8	11.4	8.7	17.8	9.1	8.1	8.3	6.2	11.5	10.1
	Gough	Laguna	W	0.18		26.7				11.8	11.1	7.2	6.2	12.9	15.2	17.5	14.2	9.8	11.2	12.3	14.9	11.4
	Laguna	Stanyan	W	1.56		19				24.5	16.2	23.2	27.9	26.4	26.3	23.8	20.0	20.5	20.0	19.4	18.1	18.5
Folsom	13th	8th	E	0.49								10.2			18.2	19.4	14.8	12.5	12.5	11.8	14.4	12.7
	8th	4th	E	0.69								24.8	13.3	14.9	17.0	18.1	12.6	12.8	13.3	13.4	13.6	14.0
	4th	1st	E	0.52								19.5	17.0	20.7	18.8	18.9	15.1	11.7	11.8	9.4	12.9	10.9
	1st	Embarcadero	E	0.34								11.5	18.6	13.2	10.8	16.4	12.2	7	7.2	6.2	12.9	8.5
Franklin	Market	Pine	N	1.06	8.5	13.3				11.5	9	13.5	16.9	14.9	12.7	15.6	11.1	9.9	10.1	10.4	12.5	10.8
	Pine	Lombard	N	0.83		14				26.3		18.3	18.3	20.5	21.1	21.0	17.8	18	18.6	18.5	18.6	15.2
Fremont	Harrison	Market	N	0.48		6.4				11.3	10.7	12.4	12.7	12.9	13.6	16.3	11.2	9.6	9.8	9.5	12.1	8.9
Fulton	Park Presidio	10th Ave	E	0.20		16.7				15.2			30.8	27.2	24.5	21.7	19.3	18.3	17.6	16.2	21.5	19.0
	10th Ave	Arguello	E	0.53		22.4				16.3			29.5	19.2	17.0	18.1	16.4	15.6	18.4	16.9	21.5	18.6
	Arguello	Masonic	E	0.66	9.8	18.6				11.5	9.9	15	12.5	16.2	13.4	15.6	14.5	13.4	13.7	12.7	17.6	17.1
	Masonic	Arguello	W	0.66		15.9				16.2		18.5	23.5	20.4	16.5	18.2	17.1	15.2	16.0	15.0	16.9	18.3
	Arguello	10th Ave	W	0.53		22				28.7			21.8	27.3	17.4	19.8	20.7	19.9	19.9	20.1	22.6	23.0
	10th Ave	Park Presidio	W	0.20		14.2				10.4	6.4		16.6	15.4	11.8	19.1	19.6	17	18.5	19.1	22.6	19.5
Geary	Great Hwy	25th Ave	E	1.78		24.2				23.5	16.4	21.5	25.3	25.0	23.1	18.3	14.4	17.5	19.4	20.2	23.2	20.6
	25th Ave	Arguello	E	1.42		21.6		10.6		20.7	10.3	16.7	25.1	23.9	20.3	16.7	13.6	14.7	15.5	16.2	22.3	17.9
	Arguello	Gough	E	1.91		25.3			24.6		15	23.6	23.4	28.5	22.2	20.5	16.4	19.6	18.8	17.0	22.5	17.6
	Kearny	Gough	W	1.18		12.3	15.4		7.2	15.2	9.5	15	14.2	15.1	14.1	13.4	11.2	10.3	10.9	9.4	13.3	11.5
	Gough	Arguello	W	1.92		23.8			24.7		15.4	17.7	20.2	20.1	20.3	21.0	16.2	17.5	17.0	16.7	18.8	19.1
	Arguello	25th Ave	W	1.42		21.3		13.7			11	15.5	23.0	22.1	19.8	16.4	14.2	13.4	13.8	12.3	15.9	15.9
	25th Ave	Great Hwy	W	1.79		28.3				26	14.7	23.3	24.3	23.9	24.5	18.3	15.4	16.8	18.6	18.8	20.0	19.4
Geneva	Ocean	Cayuga	E	0.56		15				20.4		14.7	13.3	8.8	11.9	13.8	10.9	10.1	11.6	10.2	17.4	14.5
	Cayuga	Paris	E	0.33	10.4	11.7	13			16.1	8.8	11.8	11.1	13.4	15.3	14.7	11.7	12.4	12.3	11.0	17.4	13.9
	Paris	Santos	E	1.19		29.7				25		27.2	21.2	20.6	22.9	22.6	15.8	18.6	19.3	18.1	22.9	20.9
	Santos	Paris	W	1.19		27.4				27.3		26.7	22.8	23.4	22.7	20.0	16.6	18.4	17.9	16.4	22.3	20.9
	Paris	Cayuga	W	0.33	10.4	11.6	13.3			18.7		10.4	9.9	8.2	8.7	12.9	10.7	8.5	9.5	9.0	16.5	12.5
	Cayuga	Ocean	W	0.53		4.5	15.5			15		11	6.9	9.6	8.8	13.6	10.2	8.2	9.2	8.3	14.8	11.6
Golden Gate	Masonic	Franklin	E	1.37		19.3				17.2		26.3	15.9	17.0	15.4	13.6	12.1	17.1	14.5	13.7	13.0	13.8
	Franklin	Market	E	0.65	12.2	16.9				13.2		12.2	12.4	10.7	12.3	10.9	8.1	10.2	8.0	7.6	12.7	8.1
Gough	Pine	Geary	S	0.26	9.5	25.6				28.4		21.5	23.6	20.6	16.4	19.1	13.5	13.2	13.3	15.0	16.0	13.7
	Geary	Golden Gate	S	0.33		20.1				20.1	20.9	15.3	22.5	23.2	19.1	16.8	12.7	9.6	10.8	10.4	16.0	11.4
	Golden Gate	Market	S	0.54	8.3	12.8	11.1	6.5	18.9		8.9	15.4	13.8	15.7	15.9	16.0	10.5	11	9.5	10.0	15.3	10.3

NAME	FROM	TO	TRAVEL DIRECTION	LENGTH (MI)	AVE SPEED 91	AVE SPEED 92/3	AVE SPEED 95	AVE SPEED 97	AVE SPEED 99	AVE SPEED 2001	AVE SPEED 2004	AVE SPEED 2006	AVE SPEED 2007	AVE SPEED 2009	AVE SPEED 2011	AVE SPEED 2013	AVE SPEED 2015	AVE SPEED 2017 (TMC)	AVE SPEED 2017 (XD)	AVE SPEED 2019	AVE SPEED 2021	AVE SPEED 2023
Guerrero/San Jose	Monterey	29th	N	1.17		17.3				33.8		28.3	27.3	25.6	24.4	21.2	12.7	13.4	12.5	12.9	28.2	17.5
	29th	Cesar Chavez	N	0.29	6.2	19.3				15.2		22.6	19.9	24.5	10.2	17.1	15.1	12.5	16.3	12.3	18.4	14.5
	Cesar Chavez	29th	S	0.28		26.3				20.5		19.9	22.4	21.2	12.2	20.7	15.6	14.6	15.6	12.2	16.6	18.3
	29th	Monterey	S	1.17		23.7				31.6		23.1	26.1	30.3	30.0	27.8	24.3	24.7	25.3	21.3	32.1	26.3
Harrison	Embarcadero	1st	W	0.34		34.8				13.8		18.6	12.7	20.1	17.5	17.4	13.6	9.3	9.9	9.7	14.9	13.5
	1st	4th	W	0.52		27.6				15.2		17.3	24.4	11.4	14.0	17.8	12.3	11.2	10.7	10.9	14.9	12.7
	4th	8th	W	0.69		28.9				26.2		19.1	16.0	15.8	19.5	17.9	17.2	16.9	17.1	14.3	14.2	15.3
	8th	Division	W	0.40		14.4				13.6		14.3	15.3	13.3	14.4	15.8	14.0	10.1	10.1	10.1	12.4	10.1
Hayes	Market	Gough	W	0.39		10.2	11.1	11.6	23.3		9.4	16.6	18.0	12.4	12.5	15.3	12.9	9.1	8.5	9.3	12.3	11.0
Howard	Embarcadero	S Van Ness	W	2.11		14.9				14.2		15.6	16.2	14.2	15.0	16.2	13.3	10.9	10.7	10.2	12.7	12.5
Junipero Serra	County Line	Brotherhood	N	0.29		40.4				33.3		39	45.8	40.0	44.1	27.0	27.0	18.7	15.0	15.4	51.5	19.9
	Brotherhood	19th	N	0.34	9.7	23.8				36.7		32.8	29.2	22.1	10.8	12.8	13.1	10.2	11.1	8.2	25.4	12.0
	19th	Sloat	N	1.21		27				19.4	17.3	18.8	24.7	24.9	19.8	21.6	20.6	22.9	23.0	20.7	28.6	22.3
	Sloat	19th	S	1.21		32.4				20.9	18.9	18.7	16.1	22.1	10.8	25.3	21.6	23.4	23.2	20.0	26.8	20.0
	19th	Brotherhood	S	0.33		19.9				30.7		43	39.4	39.6	42.3	42.7	39.3	42.8	45.3	42.3	45.6	44.9
	Brotherhood	County Line	S	0.30		41.9				38.7		40.4	42.5	43.5	44.1	49.0	48.7	54.6	51.5	48.4	55.2	53.0
Kearny	Market	Columbus	N	0.65	6.3	13.7		8.8	12.9	5.4	14.1	13.7	13.8	14.7	11.7	8.6	7.5	7.7	8.0	11.8	9.8	
King	4th	2nd	E	0.34									20.9			14.9	12.4	13	13.0	13.9	18.0	16.7
	2nd	4th	W	0.34									18.3			15.9	13.6	11.7	11.5	12.7	21.6	16.8
Lincoln/ Kezar	19th Ave	5th Ave	E	0.83		22.6				11.4	13.4	17.2	23.9	22.4	26.9	20.2	15.4	17.7	17.7	14.7	22.3	19.5
	5th Ave	Stanyan	E	0.70		10.7	12.2	23.4				20.3	11.9	20.3	21.1	16.0	16.7	13.2	14.3	15.5	20.4	17.9
	Stanyan	5th Ave	W	0.70		31.7				9.9	15.4	25	25.4	24.4	24.3	25.5	24.4	24	24.4	24.8	24.2	23.1
	5th Ave	19th Ave	W	0.83		25.2				10.6	13.8	26.3	27.7	25.9	29.2	23.6	21.6	18.2	18.7	19.0	22.9	21.6
Main	Mission	Market	N	0.12		9.9	9.8	8.4	11.5	11.8	9.1	13.9	16.8	10.7	21.7	12.0	5.3	8.9	9.1	9.3	12.6	9.9
Market/Portola	Sloat	Santa Clara	E	0.43		16			18.9			13.8	16.8	20.3	25.1	21.8	14.0	13.4	13.7	14.2	22.0	16.6
	Santa Clara	Burnett	E	1.34		24.1			33			18.6	20.5	19.5	18.5	21.0	15.9	15.7	16.3	15.9	21.5	20.2
	Burnett	Castro	E	1.62	7	33			22			20.9	25.4	26.5	21.1	23.5	18.8	20	18.3	18.3	24.3	22.6
	Castro	Guerrero	E	0.79	8.7	20						13.2	10.1	15.7	9.2	13.6	10.4	12.8	13.2	12.4	16.4	12.7
	Guerrero	Van Ness	E	0.43	8.3	16.3		9.3	16.2			6.7	8.9	16.0	12.9	16.2	10.6	9.9	9.8	9.5	13.0	12.0
	Van Ness	Drumm	E	1.77	9.6	14.4				8.4	9.8	9.3	12.0	12.5	11.6	12.3	10.1	7.5	7.2	7.5	11.0	10.3
	Drumm	Van Ness	W	1.77	9.6	15.3				12	11.4	12.8	13.6	14.9	15.7	13.1	11.8	7.1	7.9	8.2	8.8	8.3
	Van Ness	Guerrero	W	0.43	8.3	17.8		7.3	23.3			13.6	13.9	14.2	13.8	15.2	14.3	13.7	13.7	12.6	13.8	13.2
	Guerrero	Castro	W	0.79		18.8						16.9	15.7	15.1	12.5	17.7	15.1	12.4	12.7	12.8	16.9	15.4
	Castro	Burnett	W	1.63		28			27.5			22.6	25.1	25.3	22.4	23.3	19.9	21.3	22.0	19.0	23.3	24.2
	Burnett	Santa Clara	W	1.34		22.8			30.2			19	22.0	21.2	23.5	20.3	18.5	16.9	18.4	16.8	23.3	20.6
	Santa Clara	Sloat	W	0.43		13.2			9.5	18.2		19.6	16.2	10.4	12.5	18.6	15.4	13.6	14.3	14.7	19.6	15.4
	Masonic	Page	Geary	N	0.79	10	13.1				11.3	9.4	15.4	16.3	19.9	12.8	20.2	12.3	14.6	15.0	11.6	15.3
Geary		Bush/Euclid	N	0.20	8.5	14.6				9.7	7.9	14.2	23.8	27.0	15.4	23.1	15.7	17.6	16.8	15.0	17.9	15.9
Presidio		Geary	S	0.29	8.5	11.2	15.7			10.3	7.7	13.5	18.3	19.7	10.0	17.5	14.9	16.5	16.8	16.1	17.6	16.7
Geary		Page	S	0.79	10	16.4				14.8		11.8	16.2	17.2	11.1	19.2	14.3	13.5	14.1	12.3	15.3	14.3

NAME	FROM	TO	TRAVEL DIRECTION	LENGTH (MI)	AVE SPEED 91	AVE SPEED 92/3	AVE SPEED 95	AVE SPEED 97	AVE SPEED 99	AVE SPEED 2001	AVE SPEED 2004	AVE SPEED 2006	AVE SPEED 2007	AVE SPEED 2009	AVE SPEED 2011	AVE SPEED 2013	AVE SPEED 2015	AVE SPEED 2017 (TMC)	AVE SPEED 2017 (XD)	AVE SPEED 2019	AVE SPEED 2021	AVE SPEED 2023	
Mission/Otis	Sickles	Ocean	N	1.45		21.1			26.5			26.3	21.8	22.2	21.8	16.8	13.5	13.4	13.3	11.4	17.7	17.5	
	Ocean	Cesar Chavez	N	1.95		20.3			20.4	18.3		18.1	14.8	19.3	17.2	14.2	13.1	11.9	12.9	12.4	18.2	16.4	
	Cesar Chavez	14th	N	1.39	10.9	19.8			14.3			13.6	14.6	18.5	15.7	13.7	12.7	11.4	11.6	9.5	13.2	13.2	
	14th	9th	N	0.65		12	11.3	11	10	8.1	8.2	11	11.5	15.1	16.3	14.3	12.4	10.3	10.8	9.6	14.0	12.1	
	9th	3rd	N	0.98		13.7			13.4			9.1	18.4	13.0	17.1	16.2	16.2	13.2	14	14.4	13.2	14.8	14.1
	3rd	Embarcadero	N	0.74	9.7	8.9	10.8	11.2	8.2	8.7	8.6	11.8	10.2	17.3	12.2	14.7	10.1	7.5	8.6	7.0	12.8	10.0	
	Embarcadero	3rd	S	0.74	9.7	8	10.8	14.3	10.7	9.7	10.7	13.2	13.1	13.8	10.1	14.7	10.5	8.7	9.2	8.4	13.4	10.8	
	3rd	9th	S	0.98		16.9			16.2			8.4	16.3	16.6	15.5	15.4	16.7	14.4	13	13.2	12.9	14.6	16.2
	9th	14th	S	0.68	9.7	12.8	12.8	10.7	11.7	8.7	5.8	14.1	15.2	15.8	19.4	14.4	12.0	10.5	9.8	9.1	14.7	11.7	
	14th	Cesar Chavez	S	1.39	10.9	17.9			14.8			16	13.5	17.9	15.0	14.1	13.2	14	14.2	12.7	15.0	15.8	
	Cesar Chavez	Ocean	S	1.95		17.6			19.6			18.9	16.7	20.1	18.8	16.2	14.6	12.9	13.2	12.1	16.7	16.4	
	Ocean	Sickles	S	1.45		20.8			31.8			20.7	25.3	22.3	22.0	17.2	15.6	16	16.8	15.9	18.1	18.2	
Montgomery	Broadway	Bush	S	0.51	6.2	6.5				9.3	8.5	10.2	11.7	14.1	11.1	14.1	10.3	8.9	9.6	8.5	11.0	9.7	
North Point	Van Ness	Columbus	E	0.38		15.2				12.5	10.8	18.9	13.1	17.5	18.9	14.4	13.3	13.2	13.4	17.2	17.9	16.3	
	Columbus	Embarcadero	E	0.61		14.9				15.4		17.6	23.5	18.7	22.2	21.4	12.2	13	14.2	13.8	16.3	15.1	
	Embarcadero	Columbus	W	0.61		16				13.9		18.9	21.4	15.7	18.6	15.2	13.9	12.5	12.9	12.6	15.8	15.4	
	Columbus	Van Ness	W	0.38		15.3				13.7		17.6	17.0	16.2	16.1	16.0	12.7	11.8	8.9	8.5	13.6	13.1	
Oak	Stanyan	Divisadero	E	0.92		23.1				23.5		27.7	25.4	23.6	25.0	19.7	17.0	19.3	19.7	18.5	19.7	18.9	
	Divisadero	Fillmore	E	0.37						25.2		24.7	26.7	19.7	20.4	14.9	12.6	11.5	8.1	10.4	16.2	12.4	
	Fillmore	Laguna	E	0.27	8.2					8.8	15.3	16.5	21.4	17.0	8.8	11.8	12.9	7.1	8.1	10.4	16.2	7.8	
	Laguna	Franklin	E	0.27		20				7.5	7	14.8	12.4	15.1	17.0	13.4	9.1	9.9	10.3	10.0	16.2	11.4	
Ocean	19th Ave	Miramar	E	1.11		19.5				7.6	11.4	14.3	13.6	18.7	13.9	15.0	14.5	13.6	14.0	12.8	16.5	15.8	
	Miramar	Howth	E	0.48						7.6	8.2	12.6	12.9	11.1	11.4	14.1	11.9	11.9	11.9	12.0	14.7	12.8	
	Howth	Miramar	W	0.48		9.4	16.3			8.6	8.4	13.4	11.3	14.8	15.8	13.4	11.4	10.1	9.1	10.9	14.9	12.6	
	Miramar	19th Ave	W	1.11		15.4				9.2	8.2	13.8	13.4	11.1	14.6	14.3	13.3	11.2	11.2	12.0	16.2	14.4	
Octavia	Market	Fell	N	0.27								8.7	10.6	11.0	10.1	5.8	7.3	8.1	8.2	7.7	8.6	6.5	
	Fell	Market	S	0.28								14.5	6.8	10.4	7.5	3.3	2.8	7.5	8.5	7.3	16.0	9.2	
O'Farrell	Gough	Mason	E	0.85		16.6				13.5		11.9	12.7	13.4	12.2	14.6	11.9	10.2	9.7	9.0	12.5	11.9	
	Mason	Market	E	0.28		18.7				10.9	8.3	8.2	9.1	11.6	9.6	13.3	9.9	8.8	9.9	8.1	12.5	9.9	
Pine	Market	Kearny	W	0.38	4.6	9.9	7.3	8.1	8.3	7.9	7.2	7.5	7.3	8.8	10.5	6.9	7.4	6.5	7.6	6.8	14.3	8.8	
	Kearny	Leavenworth	W	0.63		16.2				15.6		13.4	25.2	18.2	24.1	15.2	17.6	14.2	13.6	14.7	14.3	14.3	
	Leavenworth	Franklin	W	0.46		17.2				9.4	9.4	12.3	18.3	17.7	17.7	13.5	7.5	9.9	11.9	11.5	15.3	13.1	
	Franklin	Presidio	W	1.27		20				20.4		23.7	21.0	21.3	21.8	17.3	17.1	16.1	20.0	19.3	17.7	17.2	
Potrero	Cesar Chavez	21st	N	0.61		25.2			15.5			17.8	26.6	21.2	23.5	15.2	10.4	14	15.1	16.9	15.1	13.8	
	21st	Division	N	0.80		21.4			18.3			17.7	26.5	22.5	24.3	19.0	19.5	11.7	14.8	14.4	18.9	16.9	
	Division	21st	S	0.80		24.8			18.2			21.5	20.5	23.9	19.0	19.2	14.4	15.5	15.5	15.4	17.9	16.1	
	21st	Cesar Chavez	S	0.60		20.1			13.5			19.1	25.5	22.0	23.3	17.2	14.5	17.3	16.4	18.1	21.4	18.1	
Skyline	County Line	Sloat	N	1.94		43.7			41.8			49	46.8	46.7	44.5	38.1	34.8	35.4	30.0	38.9	45.6	39.9	
	Sloat	County Line	S	1.94		41.6			41.6			48.7	39.2	42.1	40.6	41.0	32.4	34.6	32.9	35.2	40.6	39.6	
Sloat	Skyline	Junipero Serra	E	1.38		19.8	21.5	14.5	18.1	23.4		22.8	18.2	22.6	19.0	24.3	23.0	20.3	21.5	21.7	27.1	23.3	
	Junipero Serra	Skyline	W	1.38		23.3				23.5		29.8	26.1	26.7	32.0	27.7	24.0	24.9	25.4	25.7	27.7	25.2	
Stanyan	Fulton	Turk	N	0.20		12.2	12.8	13.2				13.7	15.7	16.6	15.6	14.2	18.2	14.1	14	14.9	13.8	15.8	15.1
	Turk	Fulton	S	0.20		11.6	7.4	16.7				11.7	16.6	12.3	11.1	11.2	19.2	16.2	13.5	14.3	15.9	15.5	15.8

NAME	FROM	TO	TRAVEL DIRECTION	LENGTH (MI)	AVE SPEED 91	AVE SPEED 92/3	AVE SPEED 95	AVE SPEED 97	AVE SPEED 99	AVE SPEED 2001	AVE SPEED 2004	AVE SPEED 2006	AVE SPEED 2007	AVE SPEED 2009	AVE SPEED 2011	AVE SPEED 2013	AVE SPEED 2015	AVE SPEED 2017 (TMC)	AVE SPEED 2017 (XD)	AVE SPEED 2019	AVE SPEED 2021	AVE SPEED 2023	
Sutter	Divisadero	Gough	E	0.82		13.9				12.4	16.1	15.7	14.6	16.2	14.5	15.9	10.9	11	11.6	11.1	13.0	13.6	
	Market	Mason	W	0.56		11.6	10.2	13.2			11.2	11.2	16.9	17.5	17.8	13.4	12.6	8.9	9.1	9.2	11.7	9.9	
	Mason	Gough	W	0.82	9	12.3	13.4			14.5		12.8	8.6	8.9	10.5	11.2	10.6	11.4	10.3	9.4	12.2	11.3	
	Gough	Divisadero	W	0.82		14.1				15.5		15.1	15.3	15.0	13.6	13.4	11.5	11.2	12.0	12.0	13.3	12.9	
Townsend	7th	2nd	E	0.86								16.6	15.8	19.6	17.3	17.2	14.1	11.2	11.6	11.2	17.4	16.1	
	2nd	7th	W	0.86								18.9	17.9	18.4	13.9	17.5	12.4	10.4	11.2	10.1	18.2	16.1	
Turk	Stanyan	Divisadero	E	0.91		21				15.5		17.7	20.8	18.0	17.7	17.7	15.7	12.8	13.6	12.2	18.2	16.1	
	Market	Hyde	W	0.38		10.9	11.6	11.2	11.7	8.1	11.7	16.9	12.4	14.7	12.8	10.3	12.6	10.5	10.7	8.6	11.0	9.2	
	Hyde	Gough	W	0.46		14.1				10.1	8	11.2	14.0	12.8	12.8	14.1	12.6	10.3	10.3	8.5	11.0	10.7	
	Gough	Divisadero	W	0.82		22.1				22.4		24.4	28.4	19.8	19.7	21.5	17.4	16.5	16.9	16.8	16.6	16.8	
	Divisadero	Stanyan	W	0.91		17.1				23.1		17.1	20.0	21.3	16.3	18.4	18.4	16.3	19.0	17.7	20.2	18.4	
Van Ness/S VanNess	Cesar Chavez	13th	N	1.49										17.0	20.1	18.4	18.8	16.0	15.1	15.6	17.2	13.8	
	13th	Golden Gate	N	0.81		15.9			18.2		7.3	11.8	14.6	15.0	20.2	13.9	13.0	8.9	9.1	9.4	12.3	12.5	
	Golden Gate	Washington	N	0.84		13.6			10.4	10.4	6.9	11.5	11.9	15.2	16.8	12.1	11.1	10.2	10.3	9.1	12.3	11.8	
	Washington	Lombard	N	0.58		11.9	14.3	12.1	9.4	12.6	6.9	9.2	10.2	13.6	11.3	13.1	12.7	10	10.5	8.7	12.5	13.1	
	Lombard	Washington	S	0.58	4.5	18.2				7.6	12.2	13.4	12.7	17.8	16.4	16.4	12.2	13.0	11.3	11.9	12.1	16.1	8.1
	Washington	Golden Gate	S	0.84		15				9.2	7.3	9.4	16.1	17.2	21.2	21.6	14.1	12.8	11.6	12.0	13.8	16.0	14.2
	Golden Gate	13th	S	0.80		17.3				16.6		7.4	12.7	11.8	15.7	14.0	15.3	11.7	10.7	11.0	7.7	15.6	11.4
Washington	13th	S	1.49	12.6	15.7				16.8		16	19.2	19.8	17.9	12.8	16.3	15.1	15	14.8	15.7	18.0	15.4	
Washington	Drumm	Kearny	W	0.44		14.2			7.9	30.5		17.1	14.9	14.6	12.8	10.1	11.8	9.6	10.8	10.2	11.0	11.3	
West Portal	Sloat	Ulloa	N	0.54		17.8				14.8		18.7	15.3	15.5	16.8	14.4	15.9	11.5	10.5	14.5	15.0	14.1	
	Ulloa	Sloat	S	0.54		16.1				12.4	12.1	16.1	15.1	17.5	17.4	17.2	14.8	15.8	10.9	16.4	14.0	12.7	
I-280	Junipero Serra	Weldon	E	4.03	22.9	43	27.3			43.2	43.6	31.9	56.7	47.6	37.5	35.2	29.9	24.7	21.4	20.9	64.0	33.5	
	Weldon	6th/Brannan	N	3.51		29.1				30.5	31.2	27.7	34.3	41.6	28.1	35.4	36.8	33.9	30.0	28.2	45.8	49.9	
US-101	County Line	Cortland	N	2.31	10.9	47.2	31	30.1	35.7	44.8	37.1	57.5	59.0	50.6	43.0	25.9	25.8	20.7	21.8	19.0	51.4	22.0	
	Cortland	I-80	N	1.90	21.4	21.2				28.1	27.8	38	35.4	41.7	36.9	29.6	28.2	25.9	25.8	26.3	31.7	26.6	
	I-80	Market	N	1.27	18.7	45.4	44.8	37.6	36.9				20.9	21.9	13.9	24.6	23.6	21.4	12.3	18.6	13.1	13.3	
I-80	Treasure Island	Fremont Exit	W	2.71	17.5	32.2	26.5			28.8	22.3	36.8	34.4	50.8	44.5	46.4	42.2	46	38.4	40.0	41.0	29.5	
	Fremont Exit	US-101	W	1.70	48.1	33.3	37.9	32.7	40.4	25.9	24	51.6	50.0	55.3	48.7	50.4	49.5	46.4	43.4	46.6	47.1	29.2	
I-280	6th/Brannan	Weldon	S	3.47		51.9	46.4	54.8		47.3	41	69	60.0	62.9	55.1	58.1	57.9	55.9	58.0	53.0	54.4	62.9	
	Weldon	Junipero Serra	S	4.07	55.7	57.5				51.5	50.5	65.5	66.5	65.2	60.6	64.3	63.5	64.8	64.1	62.6	63.9	63.5	
US-101	Market	I-80	S	1.17	13.5	17.9						12	46.9	40.3	41.3	26.1	33.2	31.2	36.2	24.3	42.1	24.1	
	I-80	Cortland	S	1.97	45.8	53.6	36.4	42.3	44.7	40.1	31.7	40.3	54.8	54.6	51.8	40.9	46.5	40.8	39.7	39.8	59.0	43.4	
	Cortland	Monster Park Exit	S	2.30	53.3	45.6	36.3	34.1	39	33.3	31.6	45.8	48.3	54.2	48.7	31.5	32.3	24.7	24.6	24.2	65.3	32.6	
I-80	US-101	Fremont Exit	E	1.74	18.6	53.6	36	32.4	28.8	16.3	24.9	12.3	38.1	48.1	48.5	36.8	34.7	42.3	37.1	38.7	40.9	48.6	
	Fremont Exit	Treasure Island	E	2.70	50.6	50.8	39.9	40.3	30.5	36.5	20.2	43.7	50.2	56.0	51.4	44.2	46.6	58.7	51.2	47.3	56.7	55.3	

Attachment A3-2. CMP Segments Average Speeds (PM Peak), 1991 - 2023

NAME	FROM	TO	TRAVEL DIRECTION	LENGTH (MI)	AVE SPEED 91	AVE SPEED 92/3	AVE SPEED 95	AVE SPEED 97	AVE SPEED 99	AVE SPEED 2001	AVE SPEED 2004	AVE SPEED 2006	AVE SPEED 2007	AVE SPEED 2009	AVE SPEED 2011	AVE SPEED 2013	AVE SPEED 2015	AVE SPEED 2017 (TMC)	AVE SPEED 2017 (XD)	AVE SPEED 2019	AVE SPEED 2021	AVE SPEED 2023
1st St	Market	Harrison	S	0.48	1.2	15.5				2.1	2.6	4.2	12.8	13.1	18.2	13.2	4.8	4.3	4.3	4.5	6.7	6.3
2nd St	Brannan	Market	N	0.72								9.5	11.8	10.4	13.3	3.1	5.3	6.6	7.9	8.5	11.9	9.4
	Market	Brannan	S	0.72								13.4	11.9	10.6	12.2	6.0	6.9	11.1	9.5	8.7	14.2	10.2
3rd St	Jamestown	Evans	N	1.62		18.5				20.2		12.5	21.6	22.1	24.0	17.8	17.8	16.0	15.9	11.7	16.9	15.4
	Evans	Terry Francois	N	2.36	10.3	18.5				20.5		24.0	26.1	30.1	30.0	20.4	14.1	13.8	13.9	11.2	17.7	14.5
	Terry Francois	Market	N	1.05	12.1	8.8	11.6	10.2	11.7	11.6	7.3	12.7	11.3	16.1	12.9	12.8	9.7	8.8	8.9	10.6	14.4	9.7
	Terry Francois	Evans	S	2.36	10.3	17.0				20.2		21.8	30.7	27.8	29.5	20.5	16.6	17.9	18.0	14.4	19.7	17.3
	Evans	Jamestown	S	1.62		17.6				18.1		15.8	22.2	22.3	22.7	18.7	17.5	15.6	15.2	11.4	14.9	14.8
4th St/Stockton	O'Farrell	Harrison	S	0.56	4.7	8.4	10.5	10.5	5.9	10.5	9.8	8.9	9.1	8.5	15.1	11.5	9.8	9.8	10.1	7.3	10.5	7.5
	Harrison	Channel	S	0.60									14.1	14.3	14.9	12.6	8.7	7.3	8.0	8.0	11.6	10.0
5th St	Brannan	Market	N	0.72	7.9	12.7	7.7	11.3	7.6	16.5		9.8	9.5	15.6	15.7	4.0	6.5	3.5	7.9	7.5	12.0	9.9
	Market	Brannan	S	0.72	7.9	13.5				5.2	6.3	9.3	11.2	13.1	13.8	5.4	6.7	7.0	8.1	7.7	12.7	9.1
6th St	Brannan	Market	N	0.72		12.7	7.6	11.2	9.0	6.4	6.6	12.7	11.7	11.1	11.0	12.1	7.5	7.6	7.8	7.7	13.8	10.3
	Market	Brannan	S	0.72	6.7	11.5	12.0	9.4	9.5	6.8	4.4	12.9	10.9	12.3	9.6	11.8	11.0	10.4	10.6	8.8	18.3	9.1
7th St	Brannan	Market	N	0.72	8.9	16.8			13.7		10.4	15.4	14.9	16.4	20.9	13.7	8.3	8.3	8.5	8.8	13.4	10.5
8th St	Market	Bryant	S	0.60		15.8			15.7		13.0	15.9	21.2	17.0	23.8	15.9	8.4	8.4	8.7	11.8	10.7	9.0
9th St	Brannan	Market	N	0.72	9.9	12.4	9.7	13.8	11.2	9.1	11.8	13.3	11.2	14.6	13.4	12.9	8.7	7.7	7.6	7.4	12.0	10.7
10th St	Market	Brannan	S	0.73	12.1	20.5				13.7		16.4	20.9	16.3	20.4	20.5	13.4	13.7	14.3	14.2	17.5	12.7
16th St	Market	Mission	E	0.74								11.0	10.5	10.7	11.9	14.9	13.5	9.2	9.0	7.7	11.9	11.1
	Mission	Potrero	E	0.67								13.1	9.8	12.8	11.7	14.8	11.9	7.9	8.3	7.9	13.0	10.9
	Potrero	Mission	W	0.67								11.2	13.6	15.2	13.4	12.5	11.1	9.5	10.1	8.3	13.7	11.5
	Mission	Market	W	0.74								10.6	14.1	12.3	8.4	17.0	11.7	10.1	10.7	10.6	14.3	11.8
19th Ave/Park Presidio	Junipero Serra	Sloat	N	1.25		17.5			21.5			14.8	16.0	13.5	23.2	16.9	15.2	17.0	18.9	17.2	24.2	19.6
	Sloat	Lincoln	N	2.13	11.1	21.0			18.6			21.6	24.0	23.0	21.4	17.4	19.5	18.9	19.2	18.2	21.7	16.5
	Lincoln	Lake	N	1.85		25.4			19.8			27.2	27.2	28.5	29.3	28.1	22.9	19.3	15.0	13.6	28.9	19.0
	Lake	US-101	N	1.18		35.9				15.6		34.7	44.2	46.0	43.0	44.6	17.7	40.8	39.5	40.5	39.2	38.7
	US-101	Lake	S	1.26		36.4				34.5		35.4	42.7	35.2	30.9	42.9	38.0	22.8	24.1	24.6	44.5	24.5
	Lake	Lincoln	S	1.85		26.4			20.3			24.1	15.8	19.8	24.6	19.0	16.4	13.6	13.7	12.7	15.9	12.5
	Lincoln	Sloat	S	2.13	11.1	21.9			17.5			20.5	24.3	23.6	27.7	20.2	19.8	20.5	21.1	19.3	19.5	16.4
Alemany	Sloat	Junipero Serra	S	1.25		18.4			11.9		11.9	9.9	16.9	12.1	17.7	18.2	15.8	16.6	20.4	21.3	21.5	16.7
	Junipero Serra	Lyell	E	2.95		29.5				20.8		20.4	18.6	22.4	22.0	24.3	19.9	16.8	17.3	17.2	22.2	20.8
	Lyell	Bay Shore	E	1.59		32.9				12.7	14.7	32.1	23.7	29.9	30.2	33.0	29.2	26.4	25.1	28.2	28.0	27.8
	Bay Shore	Lyell	W	1.57	4.6	30.8				23.3		32.4	23.4	31.4	24.7	31.2	27.6	24.4	25.2	23.3	26.7	26.6
Bay	Lyell	Junipero Serra	W	3.03		22.1				23.9		19.5	19.8	22.2	22.5	29.6	22.2	15.7	16.0	14.5	20.5	19.6
	Van Ness	Embarcadero	E	1.07	12.7	16.8				12.1		13.4	18.2	16.5	18.2	20.7	15.6	13.3	13.5	13.5	17.8	15.0
Bayshore	Embarcadero	Van Ness	W	1.07	12.7	12.0	15.7			13.1	13.5	18.7	18.6	16.2	16.4	19.9	14.9	14.4	14.6	14.6	20.5	15.2
	County Line	Industrial	N	2.27		22.6				33.9		22.0	20.7	21.5	23.1	23.1	20.2	18.9	19.3	17.5	24.2	19.4
	Industrial	Cesar Chavez	N	0.83		26.4				16.4		13.1	22.1	14.4	15.5	17.6	17.3	15.2	15.2	13.1	20.1	14.9
	Jerrold	Industrial	S	0.80		21.0				28.4		21.1	19.1	22.3	15.3	20.5	19.3	16.2	16.7	14.6	22.0	20.0
Beale/Davis	Industrial	County Line	S	2.26		22.0				26.4		19.7	27.0	26.3	21.8	25.5	20.6	17.7	18.3	15.8	23.7	20.3
	Clay	Mission	S	0.32		13.4				8.4	8.4	14.6	10.7	11.2	11.7	5.2	5.4	8.1	8.4	6.4	13.4	7.5

NAME	FROM	TO	TRAVEL DIRECTION	LENGTH (MI)	AVE SPEED 91	AVE SPEED 92/3	AVE SPEED 95	AVE SPEED 97	AVE SPEED 99	AVE SPEED 2001	AVE SPEED 2004	AVE SPEED 2006	AVE SPEED 2007	AVE SPEED 2009	AVE SPEED 2011	AVE SPEED 2013	AVE SPEED 2015	AVE SPEED 2017 (TMC)	AVE SPEED 2017 (XD)	AVE SPEED 2019	AVE SPEED 2021	AVE SPEED 2023
Brannan	Division	6th	E	0.54									11.6	13.7	13.6	14.7	9.9	15.7	11.2	9.0	13.3	11.1
	6th	3rd	E	0.51									9.9	10.3	17.2	14.1	8.5	7.3	7.7	7.0	13.4	12.1
	3rd	6th	W	0.52									8.6	14.0	16.4	16.9	11.0	7.9	8.6	8.4	16.4	12.2
	6th	Division	W	0.54									17.2	9.8	8.8	21.1	14.4	9.9	10.4	10.1	14.3	13.0
Broadway	Gough	Larkin	E	0.36		14.6			14.2	10.0	12.0	11.5	10.2	10.5	10.2	12.8	10.5	9.2	11.3	10.4	14.7	13.2
	Larkin	Powell	E	0.55		38.9			25.5	11.0	12.7	26.1	31.8	36.1	33.6	25.2	29.8	24.1	18.3	19.4	29.7	26.8
	Powell	Montgomery	E	0.35		16.3			12.4	10.4	11.2	12.8	11.2	13.3	14.2	9.0	10.6	9.5	11.0	9.8	14.7	11.9
	Montgomery	Embarcadero	E	0.35		13.1			8.4	7.9	7.2	9.0	9.4	14.7	13.2	6.8	5.0	8.9	9.5	8.1	15.4	12.7
	Embarcadero	Montgomery	W	0.35		15.4			9.6	4.4	6.9	10.1	13.1	14.9	13.3	9.9	10.5	9.6	10.9	8.6	13.1	11.6
	Montgomery	Powell	W	0.35	6.2	8.4	9.2	12.5	8.5	8.3	10.2	8.0	10.1	7.7	11.8	6.6	5.3	4.6	9.3	8.9	14.0	10.0
	Powell	Larkin	W	0.55		24.7			25.3	11.0	10.6	32.7	31.0	32.3	29.6	25.5	27.8	27.3	22.1	15.5	30.4	29.1
	Larkin	Gough	W	0.36	7.7	14.6			7.8	9.9	8.8	7.3	10.9	11.3	11.1	12.6	8.1	7.1	12.6	11.5	14.4	10.7
Brotherhood	Junipero Serra	Alemanya	E	0.43									21.0	26.6	24.6	29.4	22.0	21.7	21.7	20.6	23.6	20.2
	Alemanya	Junipero Serra	W	0.47									26.2	33.4	31.5	31.6	24.8	25.4	27.0	26.7	28.5	26.1
Bryant	Division	4th	E	0.99	7.7	11.8	9.8	12.8	15.7	10.6	9.6	13.3	8.8	12.7	14.3	13.9	8.6	8.0	8.4	8.3	13.1	11.0
	4th	Embarcadero	E	0.77		13.2				9.5	10.2	19.5	16.0	15.7	14.0	18.2	13.3	10.1	9.5	10.9	14.0	11.8
Bush	Masonic	Gough	E	1.24		20.0				20.5		19.0	19.6	21.2	21.9	22.7	19.1	17.1	16.3	17.7	17.6	15.8
	Gough	Market	E	1.45	3.2	10.1	11.5	11.7	11.6	10.2	9.2	12.5	13.9	14.3	11.3	16.0	10.5	9.1	9.3	9.1	13.4	10.0
Castro/Divisadero	Market	14th	N	0.32	7.7	16.7			12.1	16.1		15.2	10.0	15.7	15.2	14.7	12.8	11.9	12.4	11.9	13.9	11.9
	14th	Geary	N	1.13	4.5	12.8	11.2	12.3	11.8	11.1	9.5	9.4	13.8	12.3	11.6	14.0	11.4	10.6	10.6	9.9	12.3	11.5
	Geary	Pine	N	0.27		8.4	13.5		9.8	14.6		7.5	10.3	10.7	9.2	13.7	11.4	9.4	9.8	9.4	12.3	9.9
	Pine	Geary	S	0.27		11.6	8.1	11.0	8.3	12.6	7.9	11.7	8.6	13.5	10.1	13.0	10.2	9.3	9.7	8.8	10.9	9.7
	Geary	14th	S	1.13		15.7			11.4	12.1	8.2	12.3	9.4	11.1	10.3	12.7	9.6	9.6	10.1	9.5	10.4	9.1
	14th	Market	S	0.32		13.8			14.3	17.3		12.0	11.6	15.2	11.6	13.4	10.5	9.7	10.1	9.8	11.2	8.9
Cesar Chavez	Guerrero	Bryant	E	0.76		20.7				15.1		18.2	14.1	15.1	10.6	15.6	10.8	9.9	11.0	10.5	13.0	12.1
	Bryant	Kansas	E	0.38		26.7				8.5		31.4	30.7	27.6	30.0	27.8	21.2	21.8	17.7	17.3	23.0	23.4
	Kansas	3rd	E	0.80		17.3				12.0	15.1	19.5	22.8	25.4	22.8	22.2	18.1	16.1	15.8	16.1	22.4	18.7
	3rd	Kansas	W	0.80		16.3						21.1	16.3	22.3	19.5	23.7	18.7	17.1	16.3	16.4	21.4	17.5
	Kansas	Bryant	W	0.38		17.5						30.4	30.4	21.0	23.4	23.6	19.4	18.3	17.1	16.3	21.3	17.4
	Bryant	Guerrero	W	0.75		16.5				15.8		18.8	12.8	16.8	11.6	16.2	12.2	10.3	11.0	10.7	14.3	11.3
Clay	Kearny	Davis	E	0.38	11.7	7.0	8.7	10.4	10.4	9.4	6.5	8.7	16.3	11.7	16.2	6.6	8.7	8.2	8.8	8.3	11.6	10.2
Columbus	Montgomery	Greenwich	N	0.67	6.3	12.8	12.9	10.3	11.1	15.0		12.8	21.0	14.1	12.7	12.4	12.5	11.9	12.4	12.2	16.4	13.4
	Greenwich	North Point	N	0.42		13.4				16.2		13.3	16.8	9.2	13.4	13.3	12.6	12.4	11.6	10.5	15.3	13.5
	North Point	Greenwich	S	0.42		15.2			17.7			15.9	12.5	13.3	14.0	11.5	10.8	8.8	9.1	7.9	12.8	12.5
	Greenwich	Montgomery	S	0.67	6.3	16.0			10.2	9.3	8.7	9.2	10.4	7.1	12.3	11.9	10.2	8.9	9.5	8.6	13.2	10.8
Doyle/Lombard/Richardson	County Line	SF Cemetery	E	1.16		55.3						21.7	39.8	39.8		34.1	39.9	39.4	48.7	48.6	54.4	50.0
	SF Cemetery	Lyon/Francisco	E	0.93		32.3						23.8	32.7	35.8		38.9	35.1	29.7	20.9	19.8	34.2	58.8
	Lyon/Francisco	Van Ness	E	1.29		16.4				14.8		14.5	15.7	18.2	15.3	18.7	13.8	12.1	13.4	11.9	18.6	16.9
	Van Ness	Lyon/Francisco	W	1.29		20.5				22.4		15.3	16.0	15.7	16.4	18.0	13.3	13.4	14.2	13.3	18.3	15.7
	Lyon/Francisco	SF Cemetery	W	0.96		43.9						23.5	35.2	39.4		26.0	13.0	40.2	36.0	37.2	42.4	31.8
	SF Cemetery	County Line	W	1.15		32.6						24.2	38.8	41.0		22.4	14.2	37.3	38.8	35.3	50.6	36.4
Drumm	Market	Washington	N	0.22		12.8	13.5			24.7		11.7	11.2	16.2	17.2	8.0	6.3	8.3	8.8	7.2	13.1	9.8
	Washington	Market	S	0.22		9.3	3.6			17.4		9.7	6.1	7.6	17.7	5.5	6.0	7.6	7.2	8.1	9.3	7.7

NAME	FROM	TO	TRAVEL DIRECTION	LENGTH (MI)	AVE SPEED 91	AVE SPEED 92/3	AVE SPEED 95	AVE SPEED 97	AVE SPEED 99	AVE SPEED 2001	AVE SPEED 2004	AVE SPEED 2006	AVE SPEED 2007	AVE SPEED 2009	AVE SPEED 2011	AVE SPEED 2013	AVE SPEED 2015	AVE SPEED 2017 (TMC)	AVE SPEED 2017 (XD)	AVE SPEED 2019	AVE SPEED 2021	AVE SPEED 2023	
Duboce/Division	Market	Mission	E	0.35		10.0	15.4			7.5	6.3	9.4		14.8	16.7	22.5	15.5	11.3	10.9	9.3	12.6	10.2	
	Mission	Potrero	E	0.66	9.9	14.1				14.2		14.1		13.3	18.5	10.5	10.7	10.2	12.4	11.5	14.1	12.4	
	Potrero	Mission	W	0.66	9.9	16.4				12.0	7.1	9.4		9.6	16.2	8.6	7.2	7.1	12.1	7.5	15.7	13.4	
	Mission	Market	W	0.35	6.3	6.2				7.4	6.0	6.5		10.6	9.6	14.7	8.3	6.5	6.5	7.0	13.4	9.6	
Embarcadero	Townsend	North Point	N	2.16		9.0	16.4			14.7		16.0	15.2	14.0	8.9	14.0	11.8	12.8	13.5	14.1	17.6	13.5	
	North Point	Townsend	S	2.16		16.7				6.4	12.3	15.2	18.5	20.2	17.6	13.8	9.0	9.3	10.1	10.3	14.3	10.4	
Evans	Cesar Chavez	3rd	S	0.73		21.4				15.4		19.1	21.8	21.6	17.5	16.8	13.1	13.8	17.2	16.4	22.6	18.2	
	3rd	Cesar Chavez	N	0.73		20.3				15.2		23.8	22.7	20.1	21.5	16.9	12.2	24.6	16.8	16.0	21.1	17.4	
Fell	Gough	Market	E	0.29		13.5				9.4	8.3	7.0	18.4	12.6	12.9	18.6	12.0	8.9	9.2	6.7	11.6	10.6	
	Gough	Laguna	W	0.18	5.6	13.3	7.3	8.2	12.0	7.8	7.4	16.9	11.8	9.0	9.3	17.2	12.7	10.1	10.2	11.1	15.8	12.2	
	Laguna	Stanyan	W	1.56		20.7				23.5		19.6	23.1	23.7	24.1	22.5	19.1	18.7	20.2	18.7	16.6	15.8	
Folsom	13th	8th	E	0.49								18.0			14.6	18.4	13.4	9.4	9.5	9.5	12.7	10.1	
	8th	4th	E	0.69								18.8	21.2	17.2	19.4	17.3	9.5	8.2	8.8	8.3	11.4	12.1	
	4th	1st	E	0.52								18.3	20.0	15.0	16.9	14.8	6.4	7.8	8.2	7.3	10.7	7.6	
	1st	Embarcadero	E	0.34								10.0	17.0	12.1	12.1	16.0	11.4	7.5	7.6	7.0	10.7	8.2	
Franklin	Market	Pine	N	1.06	8.5	18.8				14.6		14.5	15.9	15.6	13.4	17.9	12.0	10.3	10.7	10.9	14.1	11.9	
	Pine	Lombard	N	0.83		16.4				7.3	7.7	17.5	21.7	23.8	20.8	21.3	16.1	16.7	17.1	17.5	17.2	12.8	
Fremont	Harrison	Market	N	0.48		9.3	10.6	16.6		3.2	5.2	14.1	10.5	10.1	10.6	16.8	8.9	7.8	8.3	9.9	13.6	10.1	
Fulton	Park Presidio	10th Ave	E	0.20										25.7	25.0	23.4	20.6	19.1	17.1	17.3	18.9	19.2	
	10th Ave	Arguello	E	0.53										23.5	15.0	18.6	17.4	14.3	17.8	18.5	18.9	17.8	
	Arguello	Masonic	E	0.66	9.8	13.2				14.8		15.0	10.9	13.6	12.2	14.8	15.2	12.2	11.9	11.1	16.4	14.1	
	Masonic	Arguello	W	0.66		18.9				14.7		20.7	23.9	20.6	13.8	18.0	15.8	13.1	13.9	13.3	16.2	17.1	
	Arguello	10th Ave	W	0.53										22.1	17.7	18.1	17.6	16.1	15.3	14.8	20.1	20.1	
	10th Ave	Park Presidio	W	0.20										8.5	11.3	18.1	14.7	13.5	14.5	13.9	20.1	14.2	
Geary	Great Hwy	25th Ave	E	1.78		26.2				20.1	16.0	23.6	23.0	21.4	23.8	18.2	14.0	15.6	17.9	18.2	19.7	17.7	
	25th Ave	Arguello	E	1.42		21.5		15.0			8.4	14.9	21.0	22.9	21.5	16.9	12.8	14.7	15.6	15.3	17.2	16.6	
	Arguello	Gough	E	1.91	11.3	22.6		20.7			14.7	22.4	27.4	20.3	20.1	18.5	14.9	17.6	17.6	14.5	18.4	15.4	
	Kearny	Gough	W	1.18	6.7	9.9	14.4		15.9	23.8	10.0	12.2	12.1	10.1	12.9	12.0	10.2	7.9	8.3	8.8	12.8	10.5	
	Gough	Arguello	W	1.92		23.1				21.2		13.3	19.1	20.5	25.0	25.1	22.3	15.0	18.5	18.5	17.0	20.0	17.4
	Arguello	25th Ave	W	1.42	11.3	20.3		15.8			10.6	15.1	18.1	17.0	17.1	15.9	11.8	13.3	14.2	14.3	17.1	15.1	
	25th Ave	Great Hwy	W	1.79		23.9				29.4	12.7	21.0	23.3	22.0	22.7	16.9	15.0	17.1	18.0	18.0	19.9	19.5	
Geneva	Ocean	Cayuga	E	0.56		12.0	17.2			14.6		12.9	11.6	8.4	12.9	14.2	9.6	10.0	10.1	9.2	15.1	12.5	
	Cayuga	Paris	E	0.33	10.4	12.1	10.5	15.5				8.8	9.2	10.8	11.5	14.4	10.7	10.6	11.1	9.9	15.1	11.2	
	Paris	Santos	E	1.19		20.5				22.1		21.0	20.5	21.2	22.0	22.4	15.6	19.1	20.0	18.7	21.4	19.7	
	Santos	Paris	W	1.19		22.6				31.3		25.2	21.2	23.6	23.4	20.4	15.5	17.5	17.0	15.0	21.7	19.8	
	Paris	Cayuga	W	0.33	10.4	12.3	10.7	11.9	12.8	12.7	10.6	10.1	9.7	10.5	8.1	13.2	10.8	9.5	10.3	9.7	16.0	12.6	
	Cayuga	Ocean	W	0.53	6.7	10.4	12.0	9.6	14.2			7.9	6.9	9.2	10.2	13.1	9.7	9.1	10.0	9.7	14.4	10.9	
Golden Gate	Masonic	Franklin	E	1.37		20.4				16.0		25.9	20.1	18.9	13.8	16.1	15.5	14.9	15.4	14.7	13.3	12.8	
	Franklin	Market	E	0.65	12.2	15.2				14.3		11.7	12.0	12.8	8.9	9.5	3.5	6.2	7.2	6.8	12.2	8.8	
Gough	Pine	Geary	S	0.26	9.5	21.8				6.5	6.3	11.4	9.6	24.3	23.0	18.4	12.6	11.6	12.0	12.5	11.1	12.1	
	Geary	Golden Gate	S	0.33		17.1				15.8	9.4	13.6	9.7	18.3	20.2	14.7	9.5	6.5	6.9	8.0	11.1	7.1	
	Golden Gate	Market	S	0.54	8.3	16.4				7.6	6.4	7.0	7.2	8.7	12.3	12.6	7.9	8.1	8.3	8.8	11.1	8.1	

NAME	FROM	TO	TRAVEL DIRECTION	LENGTH (MI)	AVE SPEED 91	AVE SPEED 92/3	AVE SPEED 95	AVE SPEED 97	AVE SPEED 99	AVE SPEED 2001	AVE SPEED 2004	AVE SPEED 2006	AVE SPEED 2007	AVE SPEED 2009	AVE SPEED 2011	AVE SPEED 2013	AVE SPEED 2015	AVE SPEED 2017 (TMC)	AVE SPEED 2017 (XD)	AVE SPEED 2019	AVE SPEED 2021	AVE SPEED 2023
Guerrero/San Jose	Monterey	29th	N	1.17		30.8				41.2		27.0	26.3	23.7	24.2	27.0	14.5	15.1	14.0	14.3	29.5	15.6
	29th	Cesar Chavez	N	0.29		12.6	7.9	17.8		15.6		14.1	16.4	20.0	12.7	18.9	14.1	14.4	17.4	12.8	14.0	12.3
	Cesar Chavez	29th	S	0.28		24.0				24.9		20.1	20.5	14.3	20.8	18.7	12.7	9.7	8.9	6.3	15.1	16.0
	29th	Monterey	S	1.17		21.6	23.0			26.8		27.7	37.7	26.0	27.6	27.2	21.9	19.1	19.9	16.0	25.1	20.4
Harrison	Embarcadero	1st	W	0.34		11.4	11.6	9.6	9.4	14.5		14.3	8.0	11.9	12.8	14.6	7.6	5.3	6.0	6.6	14.3	8.2
	1st	4th	W	0.52		20.5				14.0		20.0	22.4	16.7	18.9	16.5	13.1	7.8	8.3	9.4	14.3	11.8
	4th	8th	W	0.69	12.7	19.1				16.0		19.0	19.0	11.6	14.9	16.0	14.3	13.7	14.1	12.7	13.9	13.9
	8th	Division	W	0.40		13.6				13.0		12.4	12.7	13.2	11.6	16.1	12.8	10.5	10.7	10.6	12.8	9.9
Hayes	Market	Gough	W	0.39	5.6	11.7	15.7			10.9	7.1	11.8	13.3	9.6	8.8	11.5	11.2	7.5	7.2	7.9	11.9	9.0
Howard	Embarcadero	S Van Ness	W	2.11	5.4	13.6				13.0		12.7	14.6	12.6	12.2	15.5	11.1	9.3	9.9	9.4	13.3	11.1
Junipero Serra	County Line	Brotherhood	N	0.29		40.4				26.3		41.8	41.0	35.6	47.1	26.0	20.8	17.4	14.1	15.7	49.4	10.6
	Brotherhood	19th	N	0.34		19.1	21.7	23.6	26.5			16.2	16.4	15.2	10.5	13.8	12.9	10.7	11.8	9.2	25.1	10.3
	19th	Sloat	N	1.21		20.5	18.9	12.8	19.3	14.4	14.6	11.8	15.5	22.8	22.0	24.6	20.5	24.7	24.8	21.6	27.9	23.6
	Sloat	19th	S	1.21		18.0	20.6	11.8	12.0	18.1	14.7	18.8	14.9	16.7	16.8	26.3	18.5	20.4	20.2	17.5	23.0	18.6
	19th	Brotherhood	S	0.33		22.1				16.6	19.0	35.3	40.4	39.2	40.3	38.0	34.0	37.3	42.5	39.7	42.7	41.6
	Brotherhood	County Line	S	0.30		48.1				26.3		39.2	44.5	39.6	45.3	50.6	48.9	53.6	49.9	47.5	52.0	50.8
Kearny	Market	Columbus	N	0.65	6.3	12.9	10.8	9.2	9.1	8.1	7.2	11.7	11.2	13.0	14.8	11.9	8.9	8.3	8.3	9.0	12.7	9.8
King	4th	2nd	E	0.34									21.7			13.9	11.5	12.3	12.7	12.1	15.7	13.4
	2nd	4th	W	0.34									7.7			12.0	8.7	8.0	8.0	8.5	19.0	12.1
Lincoln/ Kezar	19th Ave	5th Ave	E	0.83		16.4				14.5		12.3	24.0	23.1	20.6	21.5	18.9	18.0	16.7	16.6	19.7	18.1
	5th Ave	Stanyan	E	0.70		22.8				14.0		22.8	21.8	21.7	22.8	22.0	21.1	20.0	20.2	20.3	19.9	18.1
	Stanyan	5th Ave	W	0.70		21.3				9.8	9.9	23.6	18.1	29.1	24.8	21.4	18.6	20.9	21.1	19.7	20.1	19.7
	5th Ave	19th Ave	W	0.83	11.3	20.8				12.0	9.1	22.7	12.8	12.9	18.9	18.0	16.4	14.5	15.2	14.4	17.5	17.3
Main	Mission	Market	N	0.12		9.8	8.4	6.7	7.7	5.4	7.5	14.4	16.3	19.3	14.3	3.2	5.0	11.0	6.7	8.4	13.1	12.8
Market/Portola	Sloat	Santa Clara	E	0.43		16.5			15.9			21.0	16.0	20.2	21.1	22.1	16.5	15.1	15.3	15.7	21.4	17.4
	Santa Clara	Burnett	E	1.34		23.6			37.4			20.6	22.2	24.0	20.0	23.1	20.2	19.0	19.8	19.9	22.2	21.2
	Burnett	Castro	E	1.62		34.1			30.9			22.0	24.5	22.0	23.5	24.6	20.9	21.4	21.0	21.8	21.0	21.2
	Castro	Guerrero	E	0.79		15.0			9.2	14.8		10.0	10.6	9.9	10.3	13.9	11.4	10.0	10.4	11.0	13.8	12.5
	Guerrero	Van Ness	E	0.43	8.3	17.9			7.4	6.7	9.0	7.0	10.5	12.1	14.8	20.3	12.2	9.1	8.3	7.8	12.5	10.1
	Van Ness	Drumm	E	1.77	9.6	12.9	6.3			8.7	9.3	11.0	9.2	9.5	10.6	11.9	8.9	6.4	6.4	6.1	12.3	10.5
	Drumm	Van Ness	W	1.77	9.6	15.5				10.0	7.4	9.9	11.5	13.5	12.1	11.7	9.4	5.6	7.4	7.3	10.2	8.7
	Van Ness	Guerrero	W	0.43	8.3	12.5	8.0	10.8	11.1	24.8		12.1	8.3	12.2	11.3	12.9	10.9	11.0	11.6	10.4	15.1	13.0
	Guerrero	Castro	W	0.79		16.5			11.5	13.2		19.4	15.0	15.1	12.7	16.0	13.0	15.4	15.8	13.6	17.0	14.0
	Castro	Burnett	W	1.63		27.0			24.7			28.0	28.4	26.7	30.1	26.3	21.9	21.2	22.0	21.7	23.4	24.2
	Burnett	Santa Clara	W	1.34		19.6			35.7			24.0	22.0	20.4	21.4	22.0	17.2	16.4	18.1	16.2	22.7	19.9
	Santa Clara	Sloat	W	0.43	11.8	22.2			18.4			14.8	7.9	8.3	14.0	19.5	13.5	13.3	14.0	13.6	20.4	14.4
	Masonic	Page	Geary	N	0.79	10.0	13.6				11.9	7.3	13.8	14.7	18.8	17.2	17.8	12.7	12.4	12.6	11.1	13.8
Geary		Bush/Euclid	N	0.20	8.5	21.5				15.1		15.5	24.7	27.0	22.4	24.1	15.8	16.8	17.0	16.7	17.9	15.4
Presidio		Geary	S	0.29	8.5	9.3	12.7	16.9				11.4	10.5	14.5	9.2	15.9	9.5	11.1	11.4	7.8	13.0	10.5
Geary		Page	S	0.79	10.0	13.4				16.3		11.1	12.5	16.9	13.5	19.2	13.4	12.6	12.7	12.8	11.8	9.0

NAME	FROM	TO	TRAVEL DIRECTION	LENGTH (MI)	AVE SPEED 91	AVE SPEED 92/3	AVE SPEED 95	AVE SPEED 97	AVE SPEED 99	AVE SPEED 2001	AVE SPEED 2004	AVE SPEED 2006	AVE SPEED 2007	AVE SPEED 2009	AVE SPEED 2011	AVE SPEED 2013	AVE SPEED 2015	AVE SPEED 2017 (TMC)	AVE SPEED 2017 (XD)	AVE SPEED 2019	AVE SPEED 2021	AVE SPEED 2023
Mission/Otis	Sickles	Ocean	N	1.45		18.1			22.0			23.0	19.8	22.4	20.3	17.3	14.2	14.1	14.2	12.4	16.7	16.6
	Ocean	Cesar Chavez	N	1.95		17.3			18.5			19.1	15.3	17.8	16.3	14.1	13.9	13.3	14.0	12.8	16.3	15.0
	Cesar Chavez	14th	N	1.39	10.9	10.5	12.3	13.0	14.7			12.6	13.8	13.9	14.2	11.8	11.1	9.6	9.7	9.4	12.3	11.6
	14th	9th	N	0.65		12.2	9.9	9.2	10.5	8.5	8.3	12.3	12.6	13.3	12.2	14.7	13.3	9.2	9.8	9.4	13.7	12.8
	9th	3rd	N	0.98		19.9			13.5	9.7	9.8	12.7	14.2	13.7	12.4	15.1	10.3	10.1	10.5	10.0	13.6	11.4
	3rd	Embarcadero	N	0.74	9.7	15.9			5.1	10.7	9.2	7.6	8.9	13.0	10.9	14.3	8.3	6.7	7.3	5.9	12.1	8.6
	Embarcadero	3rd	S	0.74	9.7	7.6	13.0		10.7	9.7	8.6	13.4	11.3	13.9	11.0	12.8	9.3	7.3	7.7	7.5	12.9	9.2
	3rd	9th	S	0.98		19.1			12.1	12.3	8.4	18.3	13.2	15.1	14.4	14.5	11.1	11.4	11.7	10.7	13.0	11.7
	9th	14th	S	0.68	9.7	14.9			16.7			12.9	13.4	13.4	13.5	12.4	10.9	10.5	9.2	9.2	13.0	8.6
	14th	Cesar Chavez	S	1.39	10.9	14.9			13.2			13.3	13.4	15.2	13.8	12.8	11.5	10.5	10.8	9.6	13.6	11.9
	Cesar Chavez	Ocean	S	1.95		15.6			14.7			14.7	14.5	13.8	15.5	13.3	11.8	11.1	11.2	10.0	15.2	14.0
	Ocean	Sickles	S	1.45		15.1			24.9			21.3	16.6	20.3	19.4	15.9	13.8	14.4	13.1	12.5	17.2	16.8
Montgomery	Broadway	Bush	S	0.51	6.2	2.4				12.4	8.2	8.2	5.5	9.2	7.2	12.8	5.5	5.0	6.1	5.6	8.9	7.5
North Point	Van Ness	Columbus	E	0.38		15.4				7.4	11.0	11.4	15.0	15.5	14.4	9.3	8.9	9.7	9.2	12.7	15.4	13.3
	Columbus	Embarcadero	E	0.61		14.5				11.4	9.9	12.8	20.3	15.9	16.3	17.7	8.4	9.3	11.4	15.0	16.6	14.6
	Embarcadero	Columbus	W	0.61		16.9				12.2	10.3	19.5	21.3	15.8	20.2	18.0	12.4	15.8	14.6	17.4	18.4	17.1
	Columbus	Van Ness	W	0.38	8.5	20.9				10.4	9.8	19.5	12.6	16.4	13.2	10.4	13.2	12.2	9.5	9.1	14.8	13.5
Oak	Stanyan	Divisadero	E	0.92		23.1				13.0	11.8	16.2	13.5	11.8	16.4	21.1	20.6	20.6	20.9	19.6	19.5	18.9
	Divisadero	Fillmore	E	0.37						16.9		24.6	26.7	25.3	26.4	23.8	18.7	19.2	8.6	12.1	12.5	13.0
	Fillmore	Laguna	E	0.27	8.2					15.3	15.7	23.8	27.8	22.3	24.5	16.6	12.4	6.2	8.6	12.1	12.5	7.0
	Laguna	Franklin	E	0.27		21.6				15.6		23.0	27.4	21.5	22.6	17.9	11.0	8.8	10.1	9.8	12.5	9.4
Ocean	19th Ave	Miramar	E	1.11		17.1				9.4	12.5	12.4	14.9	12.9	12.8	13.8	13.8	12.0	12.4	11.7	15.5	14.3
	Miramar	Howth	E	0.48	0.8	21.0				10.7	13.2	14.2	13.7	14.8	12.7	14.2	11.1	10.7	11.0	10.6	13.2	11.9
	Howth	Miramar	W	0.48	6.1	14.9				9.1	11.2	8.4	10.7	13.0	11.9	12.5	8.6	8.0	7.9	7.9	13.9	9.9
	Miramar	19th Ave	W	1.11		14.6				8.8	10.3	12.5	15.4	12.4	14.5	14.2	13.1	11.8	12.0	12.1	15.9	14.3
Octavia	Market	Fell	N	0.27								8.2	14.5	16.1	13.6	10.9	10.4	10.3	10.5	9.3	10.0	8.8
	Fell	Market	S	0.28								14.2	12.6	11.6	9.9	9.8	4.0	6.8	7.5	7.2	14.2	9.3
O'Farrell	Gough	Mason	E	0.85	5.7	13.7				12.6	14.6	9.9	10.0	11.2	11.2	13.3	10.8	8.6	8.6	8.4	11.2	10.5
	Mason	Market	E	0.28	6.9	7.9				4.2	6.7	6.7	6.1	9.0	8.0	12.5	8.5	6.8	7.9	7.2	11.2	8.2
Pine	Market	Kearny	W	0.38	4.6	10.8	7.3	10.3	6.7	8.0	4.3	8.9	5.9	8.9	13.2	4.3	6.7	5.4	6.9	6.7	13.1	8.5
	Kearny	Leavenworth	W	0.63		12.9	19.8			17.1		16.2	13.6	16.8	16.2	12.1	13.8	9.1	12.6	12.7	13.1	12.9
	Leavenworth	Franklin	W	0.46	4.8	13.2				9.4	6.5	12.6	10.9	14.3	14.5	8.5	5.2	6.0	9.3	9.1	15.5	10.5
	Franklin	Presidio	W	1.27		15.3				19.2		20.3	23.4	22.4	22.0	14.5	16.7	13.7	18.8	18.4	17.9	17.2
Potrero	Cesar Chavez	21st	N	0.61		23.8			14.5			17.0	23.6	18.8	21.3	15.1	7.7	12.9	14.2	14.0	16.8	12.9
	21st	Division	N	0.80		21.4			19.3			14.9	21.3	15.6	23.2	15.3	6.3	13.5	13.5	12.3	17.3	13.5
	Division	21st	S	0.80		22.6			18.8			16.5	20.5	25.2	22.6	14.0	8.5	15.7	16.3	13.3	16.4	14.7
	21st	Cesar Chavez	S	0.60	4.8	13.7			19.1			15.5	15.8	19.4	18.0	8.5	3.9	17.3	13.9	11.0	15.6	12.4
Skyline	County Line	Sloat	N	1.94		44.9			42.6			49.3	41.7	46.8	42.2	42.6	35.8	35.8	29.1	33.7	41.0	35.4
	Sloat	County Line	S	1.94		42.1			36.6			47.1	37.8	38.1	38.3	38.5	30.9	34.6	33.3	33.8	38.4	34.7
Sloat	Skyline	Junipero Serra	E	1.38		19.2	24.9		19.9	18.4	25.9	17.6	20.7	17.7	25.4	22.6	19.9	21.7	20.1	24.5	22.0	
	Junipero Serra	Skyline	W	1.38		23.2			27.4			24.8	27.2	26.9	29.6	29.5	24.7	24.6	24.1	22.3	25.8	24.3
Stanyan	Fulton	Turk	N	0.20	4.6	10.8	11.6	16.8				15.9	12.0	12.6	15.6	18.3	13.3	13.2	14.0	12.7	15.4	14.2
	Turk	Fulton	S	0.20		7.6	10.5	8.0	13.3			18.9	6.4	9.2	8.6	15.9	11.5	9.9	10.4	13.7	10.9	8.7

NAME	FROM	TO	TRAVEL DIRECTION	LENGTH (MI)	AVE SPEED 91	AVE SPEED 92/3	AVE SPEED 95	AVE SPEED 97	AVE SPEED 99	AVE SPEED 2001	AVE SPEED 2004	AVE SPEED 2006	AVE SPEED 2007	AVE SPEED 2009	AVE SPEED 2011	AVE SPEED 2013	AVE SPEED 2015	AVE SPEED 2017 (TMC)	AVE SPEED 2017 (XD)	AVE SPEED 2019	AVE SPEED 2021	AVE SPEED 2023	
Sutter	Divisadero	Gough	E	0.82		15.4				12.8		15.8	15.9	15.5	13.4	15.2	12.0	11.0	10.9	9.4	12.9	11.5	
	Market	Mason	W	0.56		7.3	12.4	12.7	8.0	12.7		11.6	13.5	11.3	12.7	11.9	10.4	8.0	8.1	8.1	12.5	10.1	
	Mason	Gough	W	0.82	9.0	17.0				14.6		13.3	12.4	14.6	11.8	12.3	10.9	10.8	10.4	10.8	13.0	12.0	
	Gough	Divisadero	W	0.82		16.6				14.3		13.3	15.6	14.9	13.6	13.0	11.8	11.2	11.8	12.2	14.1	13.6	
Townsend	7th	2nd	E	0.86								21.3	16.8	11.9	15.9	17.2	8.4	9.0	9.6	8.6	16.5	12.6	
	2nd	7th	W	0.86								18.7	18.0	12.8	11.4	16.5	9.4	9.1	10.1	9.0	17.9	13.7	
Turk	Stanyan	Divisadero	E	0.91		14.9				16.4		18.4	19.1	17.2	17.2	19.5	17.9	13.9	14.8	13.6	18.6	14.7	
	Market	Hyde	W	0.38		14.9				7.3	8.3	12.8	13.3	11.1	11.4	13.4	12.5	9.2	9.7	8.5	11.5	9.7	
	Hyde	Gough	W	0.46	8.7	14.9				9.1	11.3	10.5	10.6	9.3	11.3	14.6	12.0	9.9	10.2	8.6	11.5	10.2	
	Gough	Divisadero	W	0.82		27.1				18.0		19.3	21.7	19.4	18.3	22.1	16.7	15.9	16.3	16.1	16.5	15.7	
	Divisadero	Stanyan	W	0.91		19.2				14.6		21.3	18.9	25.6	17.4	19.4	17.4	15.8	17.4	17.9	18.8	17.8	
Van Ness/S VanNess	Cesar Chavez	13th	N	1.49		22.4			16.9	26.1		16.3	15.5	14.7	13.9	18.5	14.7	14.6	14.8	15.1	16.6	12.7	
	13th	Golden Gate	N	0.81		13.7			18.3		6.6	10.2	12.8	14.7	13.7	13.4	9.7	8.5	8.7	7.6	15.0	12.7	
	Golden Gate	Washington	N	0.84		15.1			11.4	12.8	9.8	16.6	16.9	17.4	21.9	14.8	11.7	13.6	13.7	13.3	16.6	11.6	
	Washington	Lombard	N	0.58		13.2			18.0	26.1	9.2	22.4	26.6	26.4	24.5	17.6	16.4	15.5	16.1	16.6	18.6	11.1	
	Lombard	Washington	S	0.58		17.7			14.5	12.8	11.7	13.5	19.9	12.4	17.1	13.7	12.3	11.4	11.9	10.4	13.1	10.1	
	Washington	Golden Gate	S	0.84	4.6	11.7	7.0	8.4	9.7	10.0	9.8	8.0	10.4	12.2	11.5	12.8	9.8	7.9	8.2	9.2	11.6	8.6	
	Golden Gate	13th	S	0.80	4.6	6.9				23.1		5.0	9.1	12.7	12.3	16.5	14.2	7.8	6.9	7.3	7.5	11.7	9.2
	13th	Cesar Chavez	S	1.49	12.6	18.2				18.9			20.2	20.4	17.1	18.7	19.0	15.1	14.7	14.8	13.8	15.5	12.1
Washington	Drumm	Kearny	W	0.44		10.3	12.5	8.0	9.5	18.4		14.1	15.2	11.3	14.9	8.1	9.1	10.9	10.0	9.5	11.3	11.5	
West Portal	Sloat	Ulloa	N	0.54		17.1				11.6	10.0	15.1	15.1	12.6	15.4	13.7	11.6	12.3	9.5	12.1	12.9	11.5	
	Ulloa	Sloat	S	0.54		18.2				11.3	8.0	17.1	15.4	15.2	16.7	13.4	14.3	13.0	10.2	11.5	13.2	10.2	
I-280	Junipero Serra	Weldon	E	4.03	54.9	59.1				45.0	43.7	67.4	60.4	64.6	61.3	65.9	63.8	65.0	63.3	56.7	66.4	63.9	
	Weldon	6th/Brannan	N	3.51		46.3	51.0	48.6	38.6	38.9	42.3	25.5	50.8	41.8	35.6	36.3	32.1	26.4	23.6	25.5	46.0	40.2	
US-101	County Line	Cortland	N	2.31	20.6	72.4				43.2	40.1	55.2	63.9	49.1	49.0	53.1	51.3	52.4	53.2	51.3	65.2	41.0	
	Cortland	I-80	N	1.90	24.6	45.8	31.8	40.9	6.2	24.0	17.8	53.1	48.6	23.6	18.3	13.3	12.8	14.8	13.8	12.6	23.5	8.5	
	I-80	Market	N	1.27	12.2	15.3					8.2	13.5	32.6	22.8	30.5	31.8	24.6	20.6	12.4	13.5	25.4	23.0	
I-80	Treasure Island	Fremont Exit	W	2.71	27.5	26.3				31.6	21.7	41.9	21.9	26.8	30.3	23.8	19.5	20.3	17.9	17.5	35.4	13.0	
	Fremont Exit	US-101	W	1.70	18.6	21.5				24.9	13.8	22.4	18.2	24.5	19.9	17.4	15.9	16.7	16.0	14.3	19.4	12.9	
I-280	6th/Brannan	Weldon	S	3.47		22.9				30.9	28.5	29.8	54.8	54.5	41.5	37.8	36.4	39.0	35.4	41.1	51.4	47.1	
	Weldon	Junipero Serra	S	4.07	51.9	56.6				44.5	31.4	54.3	53.5	45.7	50.6	52.1	48.4	45.4	45.7	43.1	58.2	45.3	
US-101	Market	I-80	S	1.17	18.8	13.4					14.9	8.9	18.9	21.3	13.1	13.4	12.6	14.3	16.0	14.1	15.8	13.9	
	I-80	Cortland	S	1.97	31.6	46.3	47.2	35.5	32.4	44.4	21.4	30.3	45.2	45.6	46.9	49.6	43.3	46.7	46.8	43.5	49.8	43.1	
	Cortland	Monster Park Exit	S	2.30	48.1	51.1	30.8	39.2	49.0	41.6	30.5	52.2	49.8	55.2	51.3	59.4	58.3	59.4	58.6	56.3	62.0	58.5	
I-80	US-101	Fremont Exit	E	1.74	19.0	25.9				14.8	10.0	8.9	19.6	7.0	10.8	9.7	7.6	7.2	6.9	6.4	8.7	8.0	
	Fremont Exit	Treasure Island	E	2.70	29.3	37.7	34.6	45.6	23.1	21.6	14.6	41.5	45.7	36.0	32.0	35.2	33.4	36.0	31.8	33.8	33.3	29.6	

Attachment A3-3. CMP Segments Level of Service (LOS), 2023

NAME	FROM	TO	TRAVEL DIRECTION	LENGTH (MI)	HCM 1985 CLASS	HCM 2000 CLASS	AM LOS (HCM 1985)	AM LOS (HCM 2000)	PM LOS (HCM 1985)	PM LOS (HCM 2000)
1st St	Market	Harrison	S	0.48	3	4	C	C	F	F
2nd St	Brannan	Market	N	0.72	3	4	D	D	D	D
	Market	Brannan	S	0.72	3	4	C	C	D	D
3rd St	Jamestown	Evans	N	1.62	3	4	C	C	C	C
	Evans	Terry Francois	N	2.36	3	3	C	D	C	D
	Terry Francois	Market	N	1.05	3	4	D	D	D	D
	Terry Francois	Evans	S	2.36	3	3	C	C	C	D
	Evans	Jamestown	S	1.62	3	4	C	C	C	C
4th St/Stockton	O'Farrell	Harrison	S	0.56	3	4	D	D	E	E
	Harrison	Channel	S	0.60	3	4	D	D	D	D
5th St	Brannan	Market	N	0.72	3	4	D	D	D	D
	Market	Brannan	S	0.72	3	4	D	D	D	D
6th St	Brannan	Market	N	0.72	3	4	D	D	D	D
	Market	Brannan	S	0.72	3	4	C	C	D	D
7th St	Brannan	Market	N	0.72	3	4	D	D	D	D
8th St	Market	Bryant	S	0.60	3	3	D	E	E	F
9th St	Brannan	Market	N	0.72	3	4	D	D	D	D
10th St	Market	Brannan	S	0.73	3	3	C	D	D	E
	Market	Mission	E	0.74	3	4	D	D	D	D
	Mission	Potrero	E	0.67	3	4	C	C	D	D
	Potrero	Mission	W	0.67	3	4	C	C	D	D
	Mission	Market	W	0.74	3	4	C	C	D	D
19th Ave/Park Presidio	Junipero Serra	Sloat	N	1.25	3	3	C	C	B	C
	Sloat	Lincoln	N	2.13	3	3	C	D	C	D
	Lincoln	Lake	N	1.85	3	3	B	B	B	C
	Lake	US-101	N	1.18	1	1	A	A	A	B
	US-101	Lake	S	1.26	1	1	A	B	C	D
	Lake	Lincoln	S	1.85	3	3	B	C	D	E
	Lincoln	Sloat	S	2.13	3	3	C	D	C	D
Alemany	Sloat	Junipero Serra	S	1.25	3	3	A	B	C	D
	Junipero Serra	Lyll	E	2.95	3	2	B	C	B	D
	Lyll	Bay Shore	E	1.59	3	2	A	C	A	C
	Bay Shore	Lyll	W	1.57	3	2	A	B	A	C
Bay	Bay Shore	Junipero Serra	W	3.03	3	2	B	D	B	D
	Van Ness	Embarcadero	E	1.07	3	4	C	C	C	C
Bayshore	Embarcadero	Van Ness	W	1.07	3	4	C	C	C	C
	County Line	Industrial	N	2.27	3	3	C	D	B	C
	Industrial	Cesar Chavez	N	0.83	3	3	C	D	C	D
	Jerrold	Industrial	S	0.80	3	3	B	C	B	C
Beale/Davis	Industrial	County Line	S	2.26	3	3	B	C	B	C
	Clay	Mission	S	0.32	3	4	D	D	E	E

NAME	FROM	TO	TRAVEL DIRECTION	LENGTH (MI)	HCM 1985 CLASS	HCM 2000 CLASS	AM LOS (HCM 1985)	AM LOS (HCM 2000)	PM LOS (HCM 1985)	PM LOS (HCM 2000)
Brannan	Division	6th	E	0.54	3	4	C	C	D	D
	6th	3rd	E	0.51	3	4	C	C	D	D
	3rd	6th	W	0.52	3	4	C	C	D	D
	6th	Division	W	0.54	3	4	C	C	D	D
Broadway	Gough	Larkin	E	0.36	3	4	C	C	C	C
	Larkin	Powell	E	0.55	1	1	D	E	C	D
	Powell	Montgomery	E	0.35	3	4	C	C	D	D
	Montgomery	Embarcadero	E	0.35	3	4	C	C	D	D
	Embarcadero	Montgomery	W	0.35	3	4	C	C	D	D
	Montgomery	Powell	W	0.35	3	4	C	C	D	D
	Powell	Larkin	W	0.55	1	1	B	C	B	C
Brotherhood	Larkin	Gough	W	0.36	3	4	C	C	D	D
	Junipero Serra	Aleman	E	0.43	3	3	B	C	B	C
Bryant	Aleman	Junipero Serra	W	0.47	3	3	A	B	A	B
	Division	4th	E	0.99	3	3	C	D	D	E
Bryant	4th	Embarcadero	E	0.77	3	3	C	E	D	E
	Masonic	Gough	E	1.24	3	3	C	D	C	D
Bush	Gough	Market	E	1.45	3	3	D	E	D	E
	Market	14th	N	0.32	3	4	D	D	D	D
Castro/Divisadero	14th	Geary	N	1.13	3	4	D	D	D	D
	Geary	Pine	N	0.27	3	4	D	D	D	D
	Pine	Geary	S	0.27	3	4	D	D	D	D
	Geary	14th	S	1.13	3	4	C	C	D	D
	14th	Market	S	0.32	3	4	D	D	E	E
Cesar Chavez	Guerrero	Bryant	E	0.76	3	4	D	D	D	D
	Bryant	Kansas	E	0.38	3	4	B	B	B	B
	Kansas	3rd	E	0.80	3	4	C	C	C	C
	3rd	Kansas	W	0.80	3	4	C	C	C	C
	Kansas	Bryant	W	0.38	3	4	B	B	C	C
	Bryant	Guerrero	W	0.75	3	4	C	C	D	D
Clay	Kearny	Davis	E	0.38	3	4	D	D	D	D
Columbus	Montgomery	Greenwich	N	0.67	3	4	C	C	C	C
	Greenwich	North Point	N	0.42	3	4	D	D	C	C
	North Point	Greenwich	S	0.42	3	4	C	C	D	D
	Greenwich	Montgomery	S	0.67	3	4	D	D	D	D
Doyle/Lombard/ Richardson	County Line	SF Cemetery	E	1.16	1	2	A	A	A	A
	SF Cemetery	Lyon/Francisco	E	0.93	1	2	A	A	A	A
	Lyon/Francisco	Van Ness	E	1.29	3	4	C	C	C	C
	Van Ness	Lyon/Francisco	W	1.29	3	4	C	C	C	C
	Lyon/Francisco	SF Cemetery	W	0.96	1	2	A	A	B	B
	SF Cemetery	County Line	W	1.15	1	2	A	A	A	A
Drumm	Market	Washington	N	0.22	3	4	D	D	D	D
	Washington	Market	S	0.22	3	4	E	E	E	E

NAME	FROM	TO	TRAVEL DIRECTION	LENGTH (MI)	HCM 1985 CLASS	HCM 2000 CLASS	AM LOS (HCM 1985)	AM LOS (HCM 2000)	PM LOS (HCM 1985)	PM LOS (HCM 2000)
Duboce/Division	Market	Mission	E	0.35	3	4	D	D	D	D
	Mission	Potrero	E	0.66	3	4	C	C	D	D
	Potrero	Mission	W	0.66	3	4	C	C	C	C
	Mission	Market	W	0.35	3	4	D	D	D	D
Embarcadero	Townsend	North Point	N	2.16	3	3	C	D	C	E
	North Point	Townsend	S	2.16	3	3	C	D	D	E
Evans	Cesar Chavez	3rd	S	0.73	3	4	C	C	C	C
	3rd	Cesar Chavez	N	0.73	3	4	C	C	C	C
Fell	Gough	Market	E	0.29	3	4	D	D	D	D
	Gough	Laguna	W	0.18	3	3	D	E	D	E
	Laguna	Stanyan	W	1.56	3	3	C	C	C	D
Folsom	13th	8th	E	0.49	3	3	D	E	D	E
	8th	4th	E	0.69	3	3	C	D	D	E
	4th	1st	E	0.52	3	3	D	E	E	F
	1st	Embarcadero	E	0.34	3	3	E	F	E	F
Franklin	Market	Pine	N	1.06	3	4	D	D	D	D
	Pine	Lombard	N	0.83	3	4	C	C	D	D
Fremont	Harrison	Market	N	0.48	3	4	E	E	D	D
Fulton	Park Presidio	10th Ave	E	0.20	3	4	B	B	B	B
	10th Ave	Arguello	E	0.53	3	4	C	C	C	C
	Arguello	Masonic	E	0.66	3	4	C	C	C	C
	Masonic	Arguello	W	0.66	3	4	C	C	C	C
	Arguello	10th Ave	W	0.53	3	4	B	B	B	B
	10th Ave	Park Presidio	W	0.20	3	4	B	B	C	C
Geary	Great Hwy	25th Ave	E	1.78	3	4	B	B	C	C
	25th Ave	Arguello	E	1.42	3	4	C	C	C	C
	Arguello	Gough	E	1.91	3	4	C	C	C	C
	Kearny	Gough	W	1.18	3	4	D	D	D	D
	Gough	Arguello	W	1.92	3	4	B	B	C	C
	Arguello	25th Ave	W	1.42	3	4	C	C	C	C
	25th Ave	Great Hwy	W	1.79	3	4	B	B	B	B
Geneva	Ocean	Cayuga	E	0.56	3	4	C	C	D	D
	Cayuga	Paris	E	0.33	3	4	C	C	D	D
	Paris	Santos	E	1.19	3	4	B	B	B	B
	Santos	Paris	W	1.19	3	4	B	B	B	B
	Paris	Cayuga	W	0.33	3	4	D	D	D	D
	Cayuga	Ocean	W	0.53	3	4	D	D	D	D
Golden Gate	Masonic	Franklin	E	1.37	3	4	C	C	D	D
	Franklin	Market	E	0.65	3	4	E	E	E	E
Gough	Pine	Geary	S	0.26	3	4	C	C	D	D
	Geary	Golden Gate	S	0.33	3	4	D	D	E	E
	Golden Gate	Market	S	0.54	3	4	D	D	E	E

NAME	FROM	TO	TRAVEL DIRECTION	LENGTH (MI)	HCM 1985 CLASS	HCM 2000 CLASS	AM LOS (HCM 1985)	AM LOS (HCM 2000)	PM LOS (HCM 1985)	PM LOS (HCM 2000)	
Guerrero/ San Jose	Monterey	29th	N	1.17	1	2	D	D	E	E	
	29th	Cesar Chavez	N	0.29	3	4	C	C	D	D	
	Cesar Chavez	29th	S	0.28	3	4	C	C	C	C	
	29th	Monterey	S	1.17	1	2	C	C	D	D	
Harrison	Embarcadero	1st	W	0.34	3	3	C	E	E	F	
	1st	4th	W	0.52	3	3	D	E	D	E	
	4th	8th	W	0.69	3	3	C	D	C	E	
	8th	Division	W	0.40	3	3	D	E	D	F	
Hayes	Market	Gough	W	0.39	3	4	D	D	E	E	
Howard	Embarcadero	S Van Ness	W	2.11	3	4	D	D	D	D	
Junipero Serra	County Line	Brotherhood	N	0.29	1	1	D	E	F	F	
	Brotherhood	19th	N	0.34	1	1	F	F	F	F	
	19th	Sloat	N	1.21	1	2	C	C	C	C	
	Sloat	19th	S	1.21	1	2	D	D	D	D	
	19th	Brotherhood	S	0.33	1	1	A	A	A	B	
	Brotherhood	County Line	S	0.30	1	1	A	A	A	A	
Kearny	Market	Columbus	N	0.65	3	4	D	D	D	D	
King	4th	2nd	E	0.34	3	4	C	C	C	C	
	2nd	4th	W	0.34	3	4	C	C	D	D	
Lincoln/ Kezar	19th Ave	5th Ave	E	0.83	3	3	B	C	C	C	
	5th Ave	Stanyan	E	0.70	3	3	C	D	C	C	
	Stanyan	5th Ave	W	0.70	3	3	B	C	B	C	
	5th Ave	19th Ave	W	0.83	3	3	B	C	C	D	
Market/Portola	Main	Mission	Market	N	0.12	3	4	D	D	D	D
	Sloat	Santa Clara	E	0.43	3	3	C	D	C	D	
	Santa Clara	Burnett	E	1.34	3	3	B	C	B	C	
	Burnett	Castro	E	1.62	3	4	B	B	B	B	
	Castro	Guerrero	E	0.79	3	3	D	E	D	E	
	Guerrero	Van Ness	E	0.43	3	3	D	E	D	E	
	Van Ness	Drumm	E	1.77	3	4	D	D	D	D	
	Drumm	Van Ness	W	1.77	3	4	E	E	E	E	
	Van Ness	Guerrero	W	0.43	3	3	C	E	C	E	
	Guerrero	Castro	W	0.79	3	3	C	D	C	E	
	Castro	Burnett	W	1.63	3	4	B	B	B	B	
	Burnett	Santa Clara	W	1.34	3	3	B	C	B	C	
	Santa Clara	Sloat	W	0.43	3	3	C	D	C	D	
	Masonic	Page	Geary	N	0.79	3	3	C	D	D	E
Geary		Bush/Euclid	N	0.20	3	3	C	D	C	D	
Presidio		Geary	S	0.29	3	3	C	D	D	E	
Geary		Page	S	0.79	3	3	C	D	D	F	

NAME	FROM	TO	TRAVEL DIRECTION	LENGTH (MI)	HCM 1985 CLASS	HCM 2000 CLASS	AM LOS (HCM 1985)	AM LOS (HCM 2000)	PM LOS (HCM 1985)	PM LOS (HCM 2000)
Mission/Otis	Sickles	Ocean	N	1.45	3	4	C	C	C	C
	Ocean	Cesar Chavez	N	1.95	3	4	C	C	C	C
	Cesar Chavez	14th	N	1.39	3	4	C	C	D	D
	14th	9th	N	0.65	3	4	D	D	D	D
	9th	3rd	N	0.98	3	4	C	C	D	D
	3rd	Embarcadero	N	0.74	3	4	D	D	E	E
	Embarcadero	3rd	S	0.74	3	4	D	D	D	D
	3rd	9th	S	0.98	3	4	C	C	D	D
	9th	14th	S	0.68	3	4	D	D	E	E
	14th	Cesar Chavez	S	1.39	3	4	C	C	D	D
	Cesar Chavez	Ocean	S	1.95	3	4	C	C	C	C
Ocean	Sickles	S	1.45	3	4	C	C	C	C	
Montgomery	Broadway	Bush	S	0.51	3	4	D	D	E	E
North Point	Van Ness	Columbus	E	0.38	3	4	C	C	C	C
	Columbus	Embarcadero	E	0.61	3	4	C	C	C	C
	Embarcadero	Columbus	W	0.61	3	4	C	C	C	C
	Columbus	Van Ness	W	0.38	3	4	C	C	C	C
Oak	Stanyan	Divisadero	E	0.92	3	3	C	C	C	C
	Divisadero	Fillmore	E	0.37	3	3	D	E	C	E
	Fillmore	Laguna	E	0.27	3	3	E	F	F	F
	Laguna	Franklin	E	0.27	3	3	D	E	D	F
Ocean	19th Ave	Miramar	E	1.11	3	4	C	C	C	C
	Miramar	Howth	E	0.48	3	4	D	D	D	D
	Howth	Miramar	W	0.48	3	4	D	D	D	D
	Miramar	19th Ave	W	1.11	3	4	C	C	C	C
Octavia	Market	Fell	N	0.27	3	4	F	F	E	E
	Fell	Market	S	0.28	3	4	D	D	D	D
O'Farrell	Gough	Mason	E	0.85	3	4	D	D	D	D
	Mason	Market	E	0.28	3	4	D	D	E	E
Pine	Market	Kearny	W	0.38	3	3	E	F	E	F
	Kearny	Leavenworth	W	0.63	3	3	C	D	D	E
	Leavenworth	Franklin	W	0.46	3	3	C	E	D	E
	Franklin	Presidio	W	1.27	3	3	C	D	C	D
Potrero	Cesar Chavez	21st	N	0.61	3	4	C	C	D	D
	21st	Division	N	0.80	3	4	C	C	C	C
	Division	21st	S	0.80	3	4	C	C	C	C
	21st	Cesar Chavez	S	0.60	3	4	C	C	D	D
Skyline	County Line	Sloat	N	1.94	3	1	A	B	A	B
	Sloat	County Line	S	1.94	3	1	A	B	A	B
Sloat	Skyline	Junipero Serra	E	1.38	1	2	C	C	D	D
	Junipero Serra	Skyline	W	1.38	1	2	C	C	C	C
Stanyan	Fulton	Turk	N	0.20	3	4	C	C	C	C
	Turk	Fulton	S	0.20	3	4	C	C	E	E

NAME	FROM	TO	TRAVEL DIRECTION	LENGTH (MI)	HCM 1985 CLASS	HCM 2000 CLASS	AM LOS (HCM 1985)	AM LOS (HCM 2000)	PM LOS (HCM 1985)	PM LOS (HCM 2000)
Sutter	Divisadero	Gough	E	0.82	3	4	C	C	D	D
	Market	Mason	W	0.56	3	4	D	D	D	D
	Mason	Gough	W	0.82	3	4	D	D	D	D
	Gough	Divisadero	W	0.82	3	4	D	D	C	C
Townsend	7th	2nd	E	0.86	3	4	C	C	D	D
	2nd	7th	W	0.86	3	4	C	C	C	C
Turk	Stanyan	Divisadero	E	0.91	3	4	C	C	C	C
	Market	Hyde	W	0.38	3	4	D	D	D	D
	Hyde	Gough	W	0.46	3	4	D	D	D	D
	Gough	Divisadero	W	0.82	3	3	C	D	C	D
	Divisadero	Stanyan	W	0.91	3	4	C	C	C	C
Van Ness/ S Van Ness	Cesar Chavez	13th	N	1.49	3	4	C	C	D	D
	13th	Golden Gate	N	0.81	3	4	D	D	D	D
	Golden Gate	Washington	N	0.84	3	4	D	D	D	D
	Washington	Lombard	N	0.58	3	4	C	C	D	D
	Lombard	Washington	S	0.58	3	4	E	E	D	D
	Washington	Golden Gate	S	0.84	3	4	C	C	E	E
	Golden Gate	13th	S	0.80	3	4	D	D	D	D
	13th	Cesar Chavez	S	1.49	3	4	C	C	D	D
Washington	Drumm	Kearny	W	0.44	3	4	D	D	D	D
West Portal	Sloat	Ulloa	N	0.54	3	4	C	C	D	D
	Ulloa	Sloat	S	0.54	3	4	D	D	D	D
I-280	Junipero Serra	Weldon	E	4.03	Fwy	Fwy	E		A	
	Weldon	6th/Brannan	N	3.51	Fwy	Fwy	C		E	
US-101	County Line	Cortland	N	2.31	Fwy	Fwy	F		E	
	Cortland	I-80	N	1.90	Fwy	Fwy	F		F	
	I-80	Market	N	1.27	Fwy	Fwy	F		F	
I-80	Treasure Island	Fremont Exit	W	2.71	Fwy	Fwy	F		F	
	Fremont Exit	US-101	W	1.70	Fwy	Fwy	F		F	
I-280	6th/Brannan	Weldon	S	3.47	Fwy	Fwy	A		D	
	Weldon	Junipero Serra	S	4.07	Fwy	Fwy	A		D	
US-101	Market	I-80	S	1.17	Fwy	Fwy	F		F	
	I-80	Cortland	S	1.97	Fwy	Fwy	D		D	
	Cortland	Monster Park Exit	S	2.30	Fwy	Fwy	E		B	
I-80	US-101	Fremont Exit	E	1.74	Fwy	Fwy	D		F	
	Fremont Exit	Treasure Island	E	2.70	Fwy	Fwy	B		F	

Attachment A3-4. CMP Segments Auto Travel Time Reliability, 2017 - 2023

NAME	FROM	TO	TRAVEL DIR	CLASS	DIST. (MI)	AM				PM			
						BUFFER INDEX 2017	BUFFER INDEX 2019	BUFFER INDEX 2021	BUFFER INDEX 2023	BUFFER INDEX 2017	BUFFER INDEX 2019	BUFFER INDEX 2021	BUFFER INDEX 2023
1st St	Market	Harrison	S	3	0.48	44%	35%	21%	31%	42%	74%	34%	23%
2nd St	Brannan	Market	N	3	0.72	38%	36%	19%	30%	57%	33%	19%	25%
	Market	Brannan	S	3	0.72	54%	31%	28%	21%	33%	38%	19%	30%
3rd St	Jamestown	Evans	N	3	1.62	26%	26%	19%	16%	29%	31%	18%	12%
	Evans	Terry Francois	N	3	2.36	30%	26%	17%	15%	56%	32%	12%	27%
	Terry Francois	Market	N	3	1.05	42%	41%	22%	36%	44%	34%	16%	28%
	Terry Francois	Evans	S	3	2.36	23%	24%	17%	13%	29%	17%	15%	17%
4th St/Stockton	Evans	Jamestown	S	3	1.62	32%	28%	18%	18%	30%	24%	15%	15%
	O'Farrell	Harrison	S	3	0.56	39%	45%	14%	18%	41%	35%	15%	20%
5th St	Harrison	Channel	S	3	0.60	39%	44%	13%	22%	40%	45%	14%	35%
	Brannan	Market	N	3	0.72		32%	19%	39%		39%	20%	24%
6th St	Market	Brannan	S	3	0.72		35%	18%	23%		30%	27%	37%
	Brannan	Market	N	3	0.72	57%	44%	34%	30%	59%	33%	38%	21%
7th St	Market	Brannan	S	3	0.72	27%	38%	12%	29%	31%	49%	15%	33%
	Brannan	Market	N	3	0.72	51%	52%	22%	35%	46%	44%	13%	14%
8th St	Market	Bryant	S	3	0.60	36%	39%	16%	17%	70%	60%	18%	40%
9th St	Brannan	Market	N	3	0.72	50%	43%	27%	33%	67%	50%	9%	18%
10th St	Market	Brannan	S	3	0.73	33%	32%	23%	21%	47%	38%	25%	43%
16th St	Market	Mission	E	3	0.74	48%	48%	26%	29%	44%	34%	14%	18%
	Mission	Potrero	E	3	0.67	51%	32%	18%	27%	36%	32%	16%	19%
	Potrero	Mission	W	3	0.67	28%	34%	21%	28%	45%	42%	16%	24%
	Mission	Market	W	3	0.74	28%	33%	18%	26%	44%	28%	10%	19%
19th Ave/ Park Presidio	Junipero Serra	Sloat	N	3	1.25	26%	36%	16%	52%	34%	30%	15%	22%
	Sloat	Lincoln	N	3	2.13	51%	55%	34%	40%	29%	29%	23%	34%
	Lincoln	Lake	N	3	1.85	28%	28%	16%	19%	153%	32%	13%	58%
	Lake	US-101	N	1	1.18	12%	11%	11%	10%	21%	51%	9%	16%
	US-101	Lake	S	1	1.26	84%	87%	11%	29%	116%	78%	11%	95%
	Lake	Lincoln	S	3	1.85	31%	32%	14%	43%	69%	28%	57%	55%
	Lincoln	Sloat	S	3	2.13	30%	27%	18%	50%	19%	21%	23%	56%
Alemany	Sloat	Junipero Serra	S	3	1.25	47%	25%	13%	18%	32%	30%	28%	34%
	Junipero Serra	Lyll	E	3	2.95	43%	23%	14%	14%	63%	17%	11%	11%
	Lyll	Bay Shore	E	3	1.59	39%	51%	15%	31%	19%	23%	14%	16%
	Bay Shore	Lyll	W	3	1.57	35%	14%	12%	13%	28%	13%	12%	16%
Bay	Lyll	Junipero Serra	W	3	3.03	39%	22%	14%	11%	32%	20%	7%	10%
	Van Ness	Embarcadero	E	3	1.07	54%	51%	12%	28%	26%	25%	12%	12%
Bayshore	Embarcadero	Van Ness	W	3	1.07	26%	31%	12%	17%	41%	33%	14%	18%
	County Line	Industrial	N	3	2.27	39%	55%	16%	41%	36%	37%	11%	23%
	Industrial	Cesar Chavez	N	3	0.83	52%	59%	23%	21%	46%	47%	13%	32%
	Jerrold	Industrial	S	3	0.80	48%	36%	16%	25%	36%	40%	15%	17%
Beale/Davis	Industrial	County Line	S	3	2.26	23%	32%	13%	17%	35%	33%	12%	18%
Beale/Davis	Clay	Mission	S	3	0.32			19%	25%			12%	41%

NAME	FROM	TO	TRAVEL DIR	CLASS	DIST. (MI)	AM				PM			
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Brannan	Division	6th	E	3	0.54	39%	26%	13%	24%	41%	41%	21%	39%
	6th	3rd	E	3	0.51	62%	37%	15%	22%	45%	41%	17%	32%
	3rd	6th	W	3	0.52	48%	32%	19%	25%	47%	54%	17%	27%
	6th	Division	W	3	0.54	41%	32%	25%	21%	48%	33%	28%	24%
Broadway	Gough	Larkin	E	3	0.36	55%	49%	14%	27%	37%	36%	23%	20%
	Larkin	Powell	E	1	0.55	113%	81%	21%	115%	67%	31%	14%	16%
	Powell	Montgomery	E	3	0.35	43%	52%	26%	40%	38%	37%	18%	23%
	Montgomery	Embarcadero	E	3	0.35	42%	34%	28%	27%	42%	34%	18%	22%
	Embarcadero	Montgomery	W	3	0.35	74%	45%	23%	26%	34%	54%	19%	31%
	Montgomery	Powell	W	3	0.35	64%	53%	19%	25%	41%	53%	14%	39%
	Powell	Larkin	W	1	0.55	33%	34%	29%	23%	30%	25%	12%	12%
	Larkin	Gough	W	3	0.36	45%	36%	14%	30%	35%	20%	11%	26%
Brotherhood	Junipero Serra	Alemanya	E	3	0.43	37%	40%	24%	32%	49%	45%	22%	28%
	Alemanya	Junipero Serra	W	3	0.47	51%	49%	21%	32%	50%	33%	18%	21%
Bryant	Division	4th	E	3	0.99	26%	37%	16%	17%	52%	48%	22%	29%
	4th	Embarcadero	E	3	0.77	59%	45%	14%	28%	102%	45%	22%	41%
Bush	Masonic	Gough	E	3	1.24	37%	26%	12%	27%	26%	20%	11%	17%
	Gough	Market	E	3	1.45	33%	33%	14%	26%	30%	21%	14%	19%
Castro/Divisadero	Market	14th	N	3	0.32	53%	48%	27%	43%	24%	43%	16%	21%
	14th	Geary	N	3	1.13	33%	29%	23%	28%	28%	28%	11%	16%
	Geary	Pine	N	3	0.27	33%	28%	26%	26%	23%	19%	12%	23%
	Pine	Geary	S	3	0.27	35%	27%	17%	23%	37%	28%	21%	26%
	Geary	14th	S	3	1.13	32%	30%	18%	25%	52%	24%	14%	26%
	14th	Market	S	3	0.32	34%	28%	25%	27%	44%	25%	24%	23%
Cesar Chavez	Guerrero	Bryant	E	3	0.76	68%	49%	38%	42%	36%	41%	28%	27%
	Bryant	Kansas	E	3	0.38	34%	33%	18%	28%	35%	37%	15%	26%
	Kansas	3rd	E	3	0.80	40%	51%	23%	19%	46%	36%	18%	18%
	3rd	Kansas	W	3	0.80	56%	48%	21%	16%	41%	34%	13%	22%
	Kansas	Bryant	W	3	0.38	41%	41%	20%	18%	42%	29%	14%	23%
	Bryant	Guerrero	W	3	0.75	36%	38%	30%	27%	35%	33%	19%	23%
Clay	Kearny	Davis	E	3	0.38		27%	20%	21%		41%	16%	25%
Columbus	Montgomery	Greenwich	N	3	0.67	23%	27%	26%	22%	35%	31%	17%	18%
	Greenwich	North Point	N	3	0.42	25%	25%	25%	29%	22%	25%	15%	20%
	North Point	Greenwich	S	3	0.42	41%	28%	14%	20%	27%	26%	16%	23%
	Greenwich	Montgomery	S	3	0.67	45%	33%	19%	33%	36%	29%	20%	20%
Doyle/Lombard/Richardson	County Line	SF Cemetery	E	1	1.16	56%	20%	7%	9%	12%	10%	6%	9%
	SF Cemetery	Lyon/Francisco	E	1	0.93	63%	49%	19%	14%	73%	84%	49%	9%
	Lyon/Francisco	Van Ness	E	3	1.29	36%	28%	13%	18%	35%	33%	21%	14%
	Van Ness	Lyon/Francisco	W	3	1.29	34%	39%	43%	18%	42%	38%	22%	30%
	Lyon/Francisco	SF Cemetery	W	1	0.96	20%	20%	14%	17%	43%	165%	10%	14%
	SF Cemetery	County Line	W	1	1.15	9%	8%	8%	9%	140%	204%	3%	225%
Drumm	Market	Washington	N	3	0.22			14%	25%			19%	27%
	Washington	Market	S	3	0.22			28%	23%			17%	26%

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Duboce/Division	Market	Mission	E	3	0.35	68%	50%	41%	41%	44%	41%	26%	26%
	Mission	Potrero	E	3	0.66		41%	31%	31%		73%	29%	22%
	Potrero	Mission	W	3	0.66	58%	58%	32%	28%	76%	69%	23%	22%
	Mission	Market	W	3	0.35	57%	45%	34%	28%	51%	43%	21%	35%
Embarcadero	Townsend	North Point	N	3	2.16	46%	35%	27%	28%	33%	21%	10%	25%
	North Point	Townsend	S	3	2.16	27%	25%	15%	21%	45%	32%	16%	34%
Evans	Cesar Chavez	3rd	S	3	0.73		57%	17%	23%		60%	13%	21%
	3rd	Cesar Chavez	N	3	0.73		48%	24%	35%		34%	24%	22%
Fell	Gough	Market	E	3	0.29	65%	35%	44%	35%	49%	53%	30%	28%
	Gough	Laguna	W	3	0.18	48%	36%	24%	31%	49%	28%	13%	22%
	Laguna	Stanyan	W	3	1.56	29%	20%	21%	25%	26%	24%	21%	32%
Folsom	13th	8th	E	3	0.49	38%	29%	16%	26%	51%	35%	15%	24%
	8th	4th	E	3	0.69	44%	36%	14%	30%	43%	44%	15%	34%
	4th	1st	E	3	0.52	40%	39%	17%	27%	93%	53%	19%	30%
	1st	Embarcadero	E	3	0.34	37%	33%	17%	30%	40%	29%	19%	22%
Franklin	Market	Pine	N	3	1.06	45%	43%	37%	42%	34%	26%	27%	24%
	Pine	Lombard	N	3	0.83	32%	28%	16%	13%	21%	17%	15%	18%
Fremont	Harrison	Market	N	3	0.48	53%	52%	35%	35%	43%	39%	24%	29%
Fulton	Park Presidio	10th Ave	E	3	0.20	40%	30%	20%	28%	56%	30%	18%	22%
	10th Ave	Arguello	E	3	0.53	53%	34%	20%	32%	61%	25%	18%	30%
	Arguello	Masonic	E	3	0.66	47%	37%	13%	30%	136%	29%	14%	29%
	Masonic	Arguello	W	3	0.66	23%	32%	21%	21%	68%	26%	16%	21%
	Arguello	10th Ave	W	3	0.53	33%	24%	19%	26%	70%	36%	18%	17%
	10th Ave	Park Presidio	W	3	0.20	38%	37%	19%	29%	59%	34%	18%	35%
Geary	Great Hwy	25th Ave	E	3	1.78	18%	19%	11%	14%	24%	18%	11%	10%
	25th Ave	Arguello	E	3	1.42	35%	38%	23%	42%	30%	33%	12%	15%
	Arguello	Gough	E	3	1.91	26%	26%	17%	14%	26%	24%	13%	10%
	Kearny	Gough	W	3	1.18	25%	29%	10%	15%	30%	31%	17%	16%
	Gough	Arguello	W	3	1.92	25%	31%	15%	10%	30%	21%	11%	13%
	Arguello	25th Ave	W	3	1.42	21%	29%	18%	15%	30%	21%	12%	15%
	25th Ave	Great Hwy	W	3	1.79	20%	20%	16%	14%	23%	25%	11%	12%
Geneva	Ocean	Cayuga	E	3	0.56	51%	34%	16%	21%	47%	31%	16%	16%
	Cayuga	Paris	E	3	0.33	32%	40%	16%	34%	27%	35%	16%	24%
	Paris	Santos	E	3	1.19	33%	32%	14%	33%	24%	27%	10%	21%
	Santos	Paris	W	3	1.19	26%	38%	17%	22%	35%	40%	11%	15%
	Paris	Cayuga	W	3	0.33	58%	39%	18%	27%	33%	40%	11%	24%
	Cayuga	Ocean	W	3	0.53	49%	36%	24%	36%	28%	32%	10%	21%
Golden Gate	Masonic	Franklin	E	3	1.37		20%	11%	11%		17%	11%	13%
	Franklin	Market	E	3	0.65		34%	13%	14%		30%	15%	17%
Gough	Pine	Geary	S	3	0.26	60%	38%	34%	25%	89%	57%	39%	56%
	Geary	Golden Gate	S	3	0.33	80%	63%	34%	78%	39%	56%	39%	41%
	Golden Gate	Market	S	3	0.54	27%	36%	29%	47%	35%	37%	37%	19%

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Guerrero/San Jose	Monterey	29th	N	1	1.17	35%	35%	29%	54%	42%	44%	11%	34%
	29th	Cesar Chavez	N	3	0.29	63%	64%	26%	45%	59%	32%	16%	29%
	Cesar Chavez	29th	S	3	0.28	42%	41%	26%	29%	79%	67%	34%	64%
	29th	Monterey	S	1	1.17	28%	33%	17%	20%	43%	35%	35%	27%
Harrison	Embarcadero	1st	W	3	0.34	40%	41%	15%	29%	61%	69%	20%	37%
	1st	4th	W	3	0.52	64%	42%	15%	14%	71%	44%	20%	24%
	4th	8th	W	3	0.69	34%	29%	14%	21%	25%	30%	14%	22%
	8th	Division	W	3	0.40	42%	41%	13%	17%	47%	29%	17%	19%
Hayes	Market	Gough	W	3	0.39	25%	39%	23%	21%	27%	26%	19%	20%
Howard	Embarcadero	S Van Ness	W	3	2.11	25%	24%	13%	12%	23%	26%	13%	16%
Junipero Serra	County Line	Brotherhood	N	1	0.29	85%	98%	19%	174%	28%	46%	19%	32%
	Brotherhood	19th	N	1	0.34	52%	47%	54%	52%	42%	28%	40%	21%
	19th	Sloat	N	1	1.21	36%	31%	17%	21%	28%	18%	14%	12%
	Sloat	19th	S	1	1.21	29%	19%	18%	13%	33%	30%	14%	13%
	19th	Brotherhood	S	1	0.33	11%	8%	13%	12%	13%	15%	12%	14%
	Brotherhood	County Line	S	1	0.30	11%	8%	11%	12%	15%	12%	13%	13%
Kearny	Market	Columbus	N	3	0.65	47%	40%	31%	29%	30%	24%	27%	17%
King	4th	2nd	E	3	0.34	65%	35%	29%	28%	48%	38%	22%	39%
	2nd	4th	W	3	0.34	85%	41%	14%	30%	66%	51%	20%	30%
Lincoln/ Kezar	19th Ave	5th Ave	E	3	0.83	56%	50%	21%	38%	40%	32%	13%	19%
	5th Ave	Stanyan	E	3	0.70	40%	40%	55%	58%	26%	25%	15%	15%
	Stanyan	5th Ave	W	3	0.70	19%	23%	15%	14%	29%	22%	12%	16%
	5th Ave	19th Ave	W	3	0.83	42%	31%	20%	25%	45%	32%	17%	25%
Main	Mission	Market	N	3	0.12	83%		14%	41%	34%		19%	16%
Market/Portola	Sloat	Santa Clara	E	3	0.43	71%	98%	22%	50%	47%	43%	13%	25%
	Santa Clara	Burnett	E	3	1.34	44%	33%	15%	23%	29%	30%	11%	14%
	Burnett	Castro	E	3	1.62	34%	34%	15%	20%	26%	23%	10%	13%
	Castro	Guerrero	E	3	0.79	45%	34%	27%	30%	33%	36%	14%	17%
	Guerrero	Van Ness	E	3	0.43	49%	43%	36%	40%	47%	44%	14%	24%
	Van Ness	Drumm	E	3	1.77	19%	25%		29%	18%	20%		32%
	Drumm	Van Ness	W	3	1.77	14%	18%			25%	15%		
	Van Ness	Guerrero	W	3	0.43	37%	42%	20%	19%	38%	37%	16%	18%
	Guerrero	Castro	W	3	0.79	49%	48%	13%	17%	35%	30%	13%	15%
	Castro	Burnett	W	3	1.63	31%	29%	11%	12%	32%	65%	8%	12%
	Burnett	Santa Clara	W	3	1.34	34%	31%	15%	20%	47%	35%	11%	15%
	Santa Clara	Sloat	W	3	0.43	43%	49%	15%	40%	56%	43%	20%	44%
Masonic	Page	Geary	N	3	0.79	31%	34%	27%	34%	26%	26%	13%	17%
	Geary	Bush/Euclid	N	3	0.20	82%	46%	29%	31%	41%	44%	20%	26%
	Presidio	Geary	S	3	0.29	54%	61%	27%	26%	55%	52%	40%	44%
	Geary	Page	S	3	0.79	32%	25%	17%	23%	75%	32%	18%	38%

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Mission/Otis	Sickles	Ocean	N	3	1.45	28%	16%	17%	17%	28%	16%	12%	13%
	Ocean	Cesar Chavez	N	3	1.95	37%	30%	15%	22%	24%	20%	13%	14%
	Cesar Chavez	14th	N	3	1.39	29%	18%	18%	17%	24%	18%	11%	10%
	14th	9th	N	3	0.65	44%	36%	15%	23%	39%	38%	12%	19%
	9th	3rd	N	3	0.98	37%	27%	17%	24%	36%	33%	13%	26%
	3rd	Embarcadero	N	3	0.74	50%	32%	16%	25%	37%	29%	21%	22%
	Embarcadero	3rd	S	3	0.74	27%	28%	22%	18%	32%	24%	18%	20%
	3rd	9th	S	3	0.98	31%	34%	18%	18%	34%	28%	12%	19%
	9th	14th	S	3	0.68	29%	55%	17%	30%	36%	47%	12%	34%
	14th	Cesar Chavez	S	3	1.39	23%	22%	12%	15%	32%	20%	14%	15%
	Cesar Chavez	Ocean	S	3	1.95	31%	18%	13%	16%	28%	23%	11%	18%
Ocean	Sickles	S	3	1.45		21%	13%	14%		20%	14%	15%	
Montgomery	Broadway	Bush	S	3	0.51	35%		14%	24%	52%		16%	17%
North Point	Van Ness	Columbus	E	3	0.38		37%	28%	18%		38%	19%	19%
	Columbus	Embarcadero	E	3	0.61		39%	36%	19%		43%	26%	18%
	Embarcadero	Columbus	W	3	0.61		38%	18%	18%		35%	15%	18%
	Columbus	Van Ness	W	3	0.38		42%	24%	17%		39%	23%	27%
Oak	Stanyan	Divisadero	E	3	0.92	42%	37%	25%	34%	32%	25%	13%	16%
	Divisadero	Fillmore	E	3	0.37	61%	59%	48%	75%	44%	46%	25%	73%
	Fillmore	Laguna	E	3	0.27	61%	59%	48%	48%	44%	46%	25%	32%
	Laguna	Franklin	E	3	0.27	65%	53%	48%	68%	49%	36%	25%	28%
Ocean	19th Ave	Miramar	E	3	1.11	30%	21%	17%	20%	22%	20%	12%	13%
	Miramar	Howth	E	3	0.48	40%	40%	21%	37%	33%	38%	16%	19%
	Howth	Miramar	W	3	0.48	41%	55%	16%	38%	44%	43%	13%	21%
	Miramar	19th Ave	W	3	1.11	36%	33%	16%	28%	25%	20%	11%	12%
Octavia	Market	Fell	N	3	0.27	51%	40%	22%	8%	40%	30%	24%	25%
	Fell	Market	S	3	0.28	36%	32%	34%	32%	45%	36%	18%	33%
O'Farrell	Gough	Mason	E	3	0.85	32%	32%	14%	16%	29%	25%	12%	19%
	Mason	Market	E	3	0.28	31%	31%	14%	26%	39%	33%	12%	31%
Pine	Market	Kearny	W	3	0.38	35%	36%	30%	25%	29%	24%	19%	29%
	Kearny	Leavenworth	W	3	0.63	36%	55%	30%	38%	40%	39%	19%	32%
	Leavenworth	Franklin	W	3	0.46		44%	27%	26%		33%	20%	35%
	Franklin	Presidio	W	3	1.27		19%	19%	15%		19%	11%	13%
Potrero	Cesar Chavez	21st	N	3	0.61	37%	35%	28%	22%	47%	31%	25%	33%
	21st	Division	N	3	0.80	33%	28%	18%	18%	34%	29%	15%	26%
	Division	21st	S	3	0.80	26%	23%	19%	17%	32%	41%	17%	21%
	21st	Cesar Chavez	S	3	0.60	35%	25%	17%	29%	56%	73%	56%	67%
Skyline	County Line	Sloat	N	3	1.94	52%	64%	12%	22%	43%	41%	11%	19%
	Sloat	County Line	S	3	1.94	57%	18%	11%	19%	26%	44%	7%	29%
Sloat	Skyline	Junipero Serra	E	1	1.38	36%	41%	14%	24%	27%	25%	10%	13%
	Junipero Serra	Skyline	W	1	1.38	55%	23%	15%	21%	54%	21%	12%	10%
Stanyan	Fulton	Turk	N	3	0.20	49%	29%	22%	26%	56%	31%	19%	18%
	Turk	Fulton	S	3	0.20	59%	77%	20%	32%	74%	82%	37%	45%

NAME	FROM	TO	TRAVEL DIR	CLASS	DIST. (MI)	AM				PM			
						BUFFER INDEX 2017	BUFFER INDEX 2019	BUFFER INDEX 2021	BUFFER INDEX 2023	BUFFER INDEX 2017	BUFFER INDEX 2019	BUFFER INDEX 2021	BUFFER INDEX 2023
Sutter	Divisadero	Gough	E	3	0.82	31%	20%	9%	15%	19%	15%	17%	11%
	Market	Mason	W	3	0.56	33%	22%	17%	21%	32%	21%	25%	17%
	Mason	Gough	W	3	0.82	30%	21%	12%	22%	30%	22%	15%	17%
	Gough	Divisadero	W	3	0.82	21%	16%	11%	14%	22%	16%	8%	14%
Townsend	7th	2nd	E	3	0.86	43%	48%	16%	22%	49%	37%	10%	39%
	2nd	7th	W	3	0.86	28%	32%	22%	23%	35%	39%	12%	26%
Turk	Stanyan	Divisadero	E	3	0.91	38%	25%	14%	18%	31%	24%	10%	20%
	Market	Hyde	W	3	0.38	37%	38%	23%	23%	39%	31%	15%	17%
	Hyde	Gough	W	3	0.46	41%	44%	23%	20%	31%	29%	15%	17%
	Gough	Divisadero	W	3	0.82	32%	43%	13%	20%	33%	26%	9%	15%
	Divisadero	Stanyan	W	3	0.91	32%	35%	14%	19%	54%	23%	13%	15%
Van Ness/S VanNess	Cesar Chavez	13th	N	3	1.49	25%	19%	17%	31%	26%	25%	15%	25%
	13th	Golden Gate	N	3	0.81	40%	51%	32%	36%	39%	42%	16%	31%
	Golden Gate	Washington	N	3	0.84	36%	38%	23%	24%	44%	40%	18%	27%
	Washington	Lombard	N	3	0.58	45%	57%	25%	19%	37%	43%	16%	20%
	Lombard	Washington	S	3	0.58	51%	44%	34%	35%	50%	38%	19%	27%
	Washington	Golden Gate	S	3	0.84	67%	88%	23%	47%	66%	45%	24%	37%
	Golden Gate	13th	S	3	0.80	74%	48%	20%	39%	49%	52%	28%	18%
Washington	Drumm	Kearny	W	3	0.44		26%	11%	23%		27%	13%	20%
West Portal	Sloat	Ulloa	N	3	0.54		26%	16%	25%		26%	18%	22%
	Ulloa	Sloat	S	3	0.54			16%	26%			20%	25%
I-280	Junipero Serra	Weldon	E	Fwy	4.03	36%	59%	13%	86%	7%	13%	4%	6%
	Weldon	6th/Brannan	N	Fwy	3.51	37%	54%	79%	37%	39%	55%	41%	74%
US-101	County Line	Cortland	N	Fwy	2.31	52%	51%	137%	58%	34%	53%	5%	56%
	Cortland	I-80	N	Fwy	1.90	29%	44%	102%	23%	78%	92%	90%	34%
	I-80	Market	N	Fwy	1.27	41%	52%	54%	35%	59%	83%	73%	88%
I-80	Treasure Island	Fremont Exit	W	Fwy	2.71	44%	44%	41%	40%	32%	27%	135%	32%
	Fremont Exit	US-101	W	Fwy	1.70	50%	49%	17%	41%	27%	25%	40%	24%
I-280	6th/Brannan	Weldon	S	Fwy	3.47	10%	9%	7%	6%	66%	32%	12%	83%
	Weldon	Junipero Serra	S	Fwy	4.07	8%	9%	5%	7%	26%	25%	18%	31%
US-101	Market	I-80	S	Fwy	1.17	96%	51%	24%	60%	51%	50%	33%	36%
	I-80	Cortland	S	Fwy	1.97	119%	90%	12%	98%	48%	49%	16%	49%
	Cortland	Monster Park Exit	S	Fwy	2.30	38%	60%	5%	80%	19%	20%	4%	27%
I-80	US-101	Fremont Exit	E	Fwy	1.74	80%	77%	125%	25%	62%	39%	22%	20%
	Fremont Exit	Treasure Island	E	Fwy	2.70	19%	20%	13%	13%	47%	64%	48%	40%

APPENDIX 4

Deficiency Plans

KEY TOPICS

- Legislative Requirements
- Legislative Intent and Application to San Francisco
- Deficiency Planning Process
- Special Issues

A4.1 Legislative Requirements

The Transportation Authority, as Congestion Management Agency (CMA), is required by state law to ascertain the City and County's conformance with the CMP, including Deficiency Plans prepared by City departments. If the LOS of roadways on the CMP network is not maintained to the established standard and they are not exempt from LOS standards, state CMP legislation requires that the local jurisdiction develop a Deficiency Plan to improve operating conditions on the segment.¹

Deficiency Plans must contain the following components:

- An analysis of the causes of the deficiency;
- A list of improvements that would have to be made to remedy the deficiency, including cost estimates;
- A list of proposed improvements; and
- An implementation plan including a schedule.²

The Deficiency Plan must “measurably improve multimodal performance” on the designated CMP roadway network, and “contribute to significant improvements in air quality.” Proposed improvements must be drawn from an inventory of acceptable actions compiled by the air quality management district. The statutes also require that the city or county forward the Deficiency Plan to the CMA, which must hold a public hearing within 60 days of receipt of the Deficiency Plan, and either accept or reject it, but not modify it. Rejection of a Deficiency Plan by the CMA will result in a finding of non-conformance with the CMP.

Unfortunately, the statutes make no provisions for funding City departments' deficiency plans, and similarly, CMAs do not receive state funding for their activities. In the absence of dedicated funding, the deficiency planning process has been designed to use existing data and coordinate with the City's budgetary process.

¹ California Government Code section 65089.4(a) states “A local jurisdiction shall prepare a Deficiency Plan when highway or roadway level of service standards are not maintained on segments or intersections of the designated system. The Deficiency Plan shall be adopted by the city or county at a noticed public hearing.”

² California Government Code section 65089.4(c)

A4.2 Legislative Intent and Application to San Francisco

This section provides background information on Deficiency Plans and their applicability to San Francisco.

A4.2.1 ABOUT DEFICIENCY PLANS

In 1990, the California voters approved Proposition 111, increasing the gasoline tax by nine cents per gallon of gasoline sold in the state. The year prior to Proposition 111's approval, the State Legislature approved AB 471 (Katz), the original CMP legislation.¹ AB 471 required all local jurisdictions to maintain the adopted LOS standard on all CMP roadways or risk losing their Proposition 111 gas tax revenues. The Legislature then revised the original legislation to allow jurisdictions to continue to receive their share of Proposition 111 gas tax moneys when the level of service (LOS) on a CMP road segment or intersection falls below LOS "E" provided local jurisdictions prepared Deficiency Plans for those segments. Deficiency Planning requirements do not apply for CMP segments that are exempt from the LOS standard.

The intent of Deficiency Plans, therefore, is to allow development to continue as long as any resulting traffic congestion is "offset." Deficiency Plans are reactive solutions applied after the impacts to LOS are actually measured.

The Deficiency Plan legislation offers local jurisdictions two alternatives:

1. Eliminate the problem (correct the deficiency where it manifests itself). This is known as *direct remediation*; or
2. Implement other actions that improve the overall performance of the CMP network, even if the actions do not directly improve the original deficiency. These are known as *offsetting actions*.

A Deficiency Plan may include both remediation and offsetting actions. Direct mitigation involves removing the deficiency such that the LOS is improved above LOS F. Direct mitigations of LOS impacts may have prohibitive costs, regulatory obstacles, or overwhelming environmental consequences. Offsetting actions provide alternative compensations that may leave the facility no less deficient from an LOS perspective, but provide improvements in other part of the system. Offsetting actions, as opposed to direct remediation, include capital improvements, transportation programs, services, or other activities that improve the average countywide level of service.

¹ The 1989 CMP legislation was part of the AB 471 legislation known as the Katz-Kopp-Baker-Campbell Transportation Blueprint for the 21st Century. Voter approval of Proposition 111 on June 5, 1990 effectively enacted the CMP legislation into law.

One major legislative change to the deficiency plan process is SB 1636 (Figueroa), which was enacted in September 2002 and then amended by SB 743 (Steinberg) in 2013. This bill allows local jurisdictions to designate areas meeting certain land use and transportation requirements as Infill Opportunity Zones (IOZs). Network segments within these zones would be exempt from automobile LOS standards.

In December 2009, the Board of Supervisors adopted a resolution designating all eligible areas of San Francisco as an IOZ. CMP network segments within a designated IOZ are exempt from deficiency planning requirements. The Transportation Authority intends to work on updating the IOZ in San Francisco to align with state legislation under SB 743 before the next CMP cycle.

A4.2.2 DEFICIENCY PLANS AND ENVIRONMENTAL REVIEW

Deficiency Plans are distinct from City processes for review of development projects pursuant to the California Environmental Act (CEQA) and do not replace local Transportation Impact Analyses (TIAs). The San Francisco Planning Department requires project sponsors to prepare TIAs for projects that may have significant negative impacts on transportation conditions. The City's TIA guidelines include some analyses that may be relevant for preparing CMP deficiency plans. However, while environmental analysis conducted pursuant to CEQA may provide information useful in the preparation of Deficiency Plans, these Plans serve a separate and distinct purpose. The Deficiency Plan process should avoid duplicating past CEQA analyses; these guidelines should not create additional review processes for individual development or public construction projects.

One fundamental difference between a TIA and the CMP is that a TIA forecasts the severity of a project's expected impacts on facilities, while a Deficiency Plan implements actions to mitigate – or offset – problems already detected (i.e., deficiencies actually measured on a facility). A TIA or EIR is prepared prior to project implementation, in an attempt to predict a project's future negative impacts.

A TIA or EIR considers the cumulative impacts on a transportation facility of a proposed project in combination with other foreseeable similar projects. The Deficiency Plan, because its focus is on a facility rather than an individual project, considers multiple causes of the existing deficiency.

A4.3 Deficiency Planning Process

This overview accompanies the flow charts in Figure A4-1, Figure A4-2, and Figure A4-3. These three figures represent the Deficiency Plan process from detection through Transportation Authority Board approval of the Plan.

A4.3.1 DEFICIENCY DETECTION AND CITY NOTIFICATION

See Figure A4-1. The Transportation Authority monitors the CMP roadway network and reports a potential deficiency when the level of service (LOS) on any non-exempted segment of the CMP roadway network measures LOS F. LOS F is defined by travel speeds below a threshold set by the 1985 HCM for any of three specified arterial types.

The Transportation Authority determines whether a reported deficiency may have been caused by external, exempt, or temporary causes. State legislation requiring Deficiency Plans has specifically exempted the trips generated by specific activities (Government Code § 65089.4. (f)). Exempt activities are:

- Inter-regional travel (i.e., pass through trips which have neither origin or destination in San Francisco);
- Construction, rehabilitation, or maintenance of facilities that impact the CMP roadway network;
- Impact of freeway ramp metering;
- Traffic signal coordination by the state or multi-jurisdictional agencies;
- Traffic generated by low- and very low-income housing;
- Traffic generated by high-density residential or mixed-use development located within a quarter mile of a fixed passenger rail station;¹ and
- Roadway segments located within infill opportunity zones.

A detected deficiency may be corrected when a roadway improvement already programmed in the CIP increases the capacity of the deficient roadway. If the lead department determines that the effects of any CIP improvement scheduled to begin within the seven year time horizon of the CIP will remove the deficiency, the Transportation Authority – after review – can make a Finding of No Deficiency. The lead department, however, must demonstrate this CIP improvements will be completed and functioning within ten years of the current CIP.

If any trips are exempt and if the deficiency still exists after removing the exempt trips from the deficient roadway segment, a Deficiency Plan must be prepared. The Transportation Authority will consult with MTC to determine whether external or pass through trips may have caused the deficiency. It will also review all relevant CEQA traffic analysis and/or TIAs of recently completed projects. It will then use the San Francisco Travel Demand Forecasting Model, GIS analysis, sketch planning techniques, and other

¹ "High density residential development" means a minimum of 24 dwelling units per acre and equal to 120 percent of the maximum density allowed under the local general plan and zoning ordinance, or a minimum density of 75 dwelling units per acre. "Mixed use development" must have more than one half the land area or floor area used for high-density housing.

means to isolate and examine the cause(s) in more detail. If modeling suggests that a deficiency is not caused by any of the above, then the Transportation Authority Board must adopt a finding of “Deficiency” and notify the City (Mayor’s Office) of the nature and cause of the deficiency.

The Mayor’s Office assigns a City department to act as the lead department for the preparation of a Deficiency Plan. The timelines in Figure A4-1 assume that LOS is monitored in September and October, and that all follow up verification monitoring is completed by the following April. This schedule allows City Departments to incorporate funding requests for Deficiency Plan activities into the City’s budget process in April and May.

A4.3.2 DEFICIENCY ANALYSIS AND REMEDIATION PLAN PREPARATION

Once the cause(s) of the deficiency have been determined, State law (Government Code § 65089.4 (c) (2)) requires that the lead department identify:

“A list of improvements necessary for the deficient segment or intersection to maintain the minimum level of service otherwise required and the estimated costs of the improvements.”

The lead department will use sketch-planning methods consistent with both MTC and Transportation Authority practices and data to estimate the effects of capacity improvements on the level of service and whether the improvements provide capacity at an order-of-magnitude commensurate with the deficiency.

State law requires that a Deficiency Plan first seek direct action to correct a roadway LOS deficiency by preparing a Remediation Plan. The lead department prepares a Remediation Plan that includes: a) a description of the causes of the deficiency; b) a list of all improvements necessary to fully remediate the problem on the deficient roadway itself; and c) an estimate of the cost and available funding for those improvements. The lead department includes a statement as to the feasibility of the Remediation Plan. A Remediation Plan usually involves adding sufficient capacity to the roadway to allow traffic to flow at LOS “E” or better. The Remediation Plan should include any relevant projects included in the CIP or CEQA mitigation measures included in specific EIRs as mitigation requirements. A proposed Remediation Plan may include improvements already specified and funded in an EIR, the CIP, or developer exactions or dedications found to be relevant, including scheduled implementation, project characteristics, and funding sources. This gives the City credit for any required EIR mitigation measures to remediate the deficiency.

The lead department should also prepare cost estimates for improvements to mitigate the deficiency as well as of the funding sources.

If the lead department finds that the package of remediation measures is feasible, it must prepare an Implementation Plan.

The lead department submits the Remediation Plan and an Implementation Plan to the Transportation Authority for evaluation and approval. The Transportation Authority will evaluate Deficiency Plans based on effectiveness, financial feasibility, environmental compatibility, and consistency with the City's transportation planning priorities and policies. If the lead department finds it cannot remediate the deficiency and the Transportation Authority concurs, the lead department prepares a Deficiency Plan (presented in Figure A4-3).

The resulting Remediation Plan must include estimates of the following:

- Extra roadway capacity needed to remove the deficiency;
- Total costs of the capacity increases; and
- Improvements already funded through the CIP or developer exactions or dedications.

The Transportation Authority evaluates the feasibility of the Remediation Plan and accepts or rejects the lead department's findings. Within 30 days of receiving the Remediation Plan from the lead department, the Transportation Authority evaluates the adequacy of the Plan conclusions according to the following three criteria:

1. **Effectiveness:** Are the proposed improvements adding sufficient capacity to the roadway in question to increase the LOS to level "E" or better?
2. **Financially Reasonable:** Are the cost estimates for the proposed improvement reasonably accurate?
3. **Implementability:** In environmental, regulatory, and community terms? Is the Plan consistent with the General Plan?

The Lead Department prepares an Implementation Plan, identifying responsible departments, funding sources, and regulatory authority. If the Transportation Authority accepts the Implementation Plan, the Transportation Authority modifies the CIP to conform to reflect the remediation measures. All departments called upon to implement portions of the Remediation Plan must enter into an inter-agency agreement stating each department's responsibility and funding sources. If the Transportation Authority finds that the Remediation Plan is feasible, the lead department will prepare an Implementation Plan. If the Transportation Authority finds that the Remediation Plan is not feasible, the lead department will prepare a Deficiency Plan Action List.

A4.3.3 DEFICIENCY PLAN EVALUATION AND APPROVAL

If the Transportation Authority determines that the Remediation Plan is infeasible, the lead department prepares a list of offsetting actions that will improve the system-wide multimodal level of service but may have only limited effect on the deficient facility itself.

The lead department prepares a Deficiency Plan Action List. The lead department may select actions that have some direct mitigating effect on the deficiency; and/or actions that will improve system-wide LOS (as measured by the multi-modal performance measures). The Bay Area Air Quality Management District (BAAQMD) has prepared a list of approved Deficiency Plan actions. The CMP legislation requires that all Deficiency Plan actions come from that list.

The lead department may choose to prepare (or Transportation Authority may request) one or more alternative action plans to explore alternative approaches.

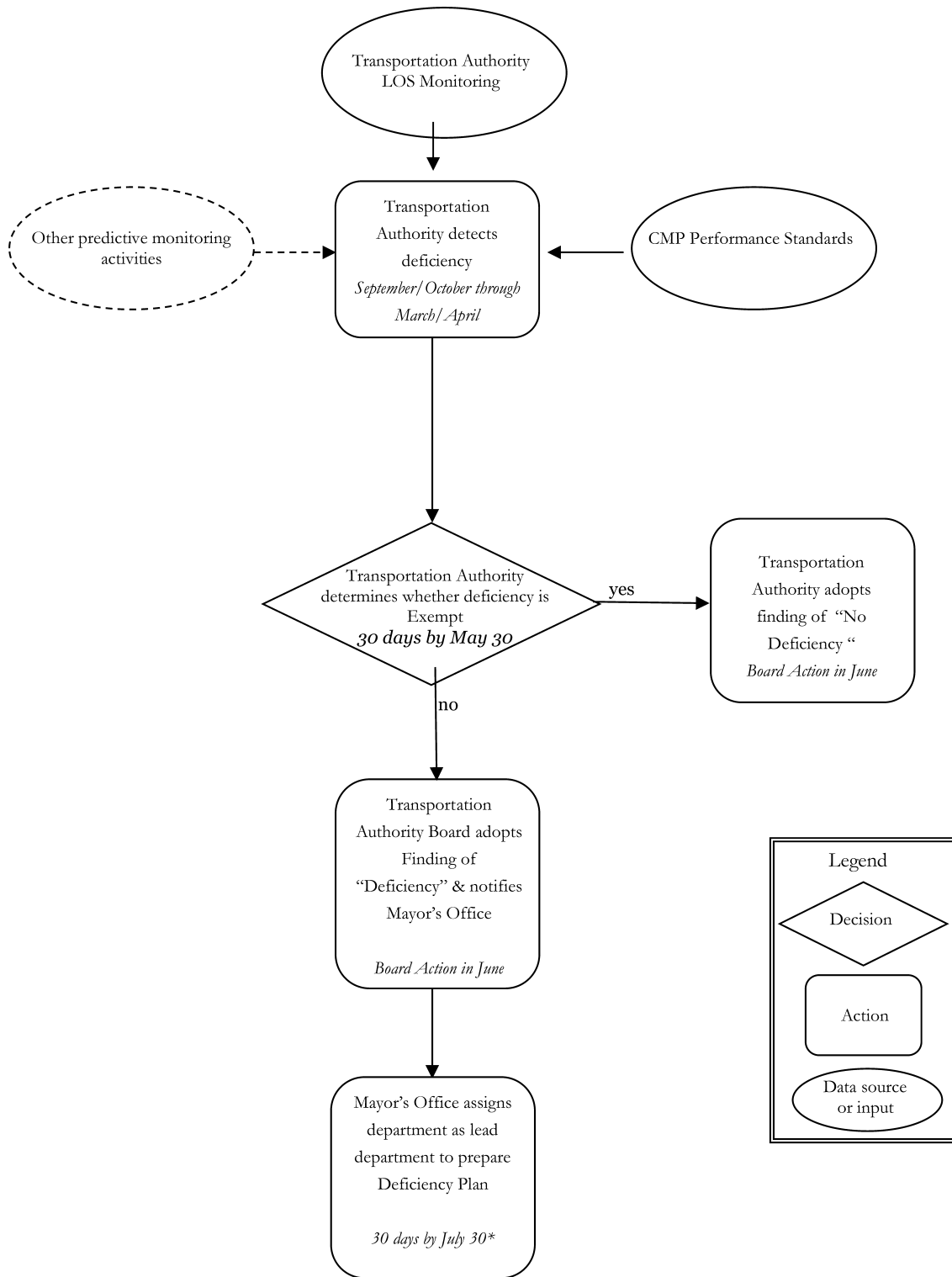
For deficiencies caused by large projects, some of the analysis required in these steps may have been completed through the projects' EIRs. While the analysis and any other relevant documentation may be used verbatim for the Deficiency Plan or Implementation Plan, the Final Deficiency Plan documentation must conform to the requirements outlined in the six steps above and described in more detail below.

The lead department has 60 days to prepare a Preferred Action Plan List. Each action on the list must show its estimated capital (or start-up) and operating (or on-going) costs. The lead department submits this list to the Transportation Authority for its consideration.

The Transportation Authority will review this proposed list and approve or reject it. The Transportation Authority will evaluate the preferred Deficiency Plan Action List, including each action's estimated cost within 30 days of submittal by the lead department. The Transportation Authority evaluates the effectiveness of the Action Plan and confirms General Plan consistency with the Planning Department. If the Transportation Authority accepts the lead department's proposed list of Deficiency Plan actions, the lead department prepares an Implementation Plan and submits this plan for the Transportation Authority's approval.

The Transportation Authority evaluates Implementation Plans using similar adequacy criteria as for Remediation Plans (Figure A4-2). If the Transportation Authority accepts the Implementation Plan, the Transportation Authority Board will hold a noticed public meeting and adopt a Finding of Conformance. If the Transportation Authority and the lead department are unable to agree on an Implementation Plan, the lead department may either try again, or submit its Final Deficiency Plan (including its Implementation Plan) to the Transportation Authority Board for Board action. If the Transportation Authority Board issues a Finding of Non-Conformance, the Transportation Authority must notify the State Controller to withhold funds. The funds are held in escrow for 12 months and then turned over to the Transportation Authority (as the City's Congestion Management Agency). Deficiency Plans must be completed within one year of the CMA's official notice of a deficiency.

Figure A4-1. Deficiency Detection and City Notification



***Go to Figure 2**

Figure A4-2. Deficiency Analysis and Mitigation Plan Preparation

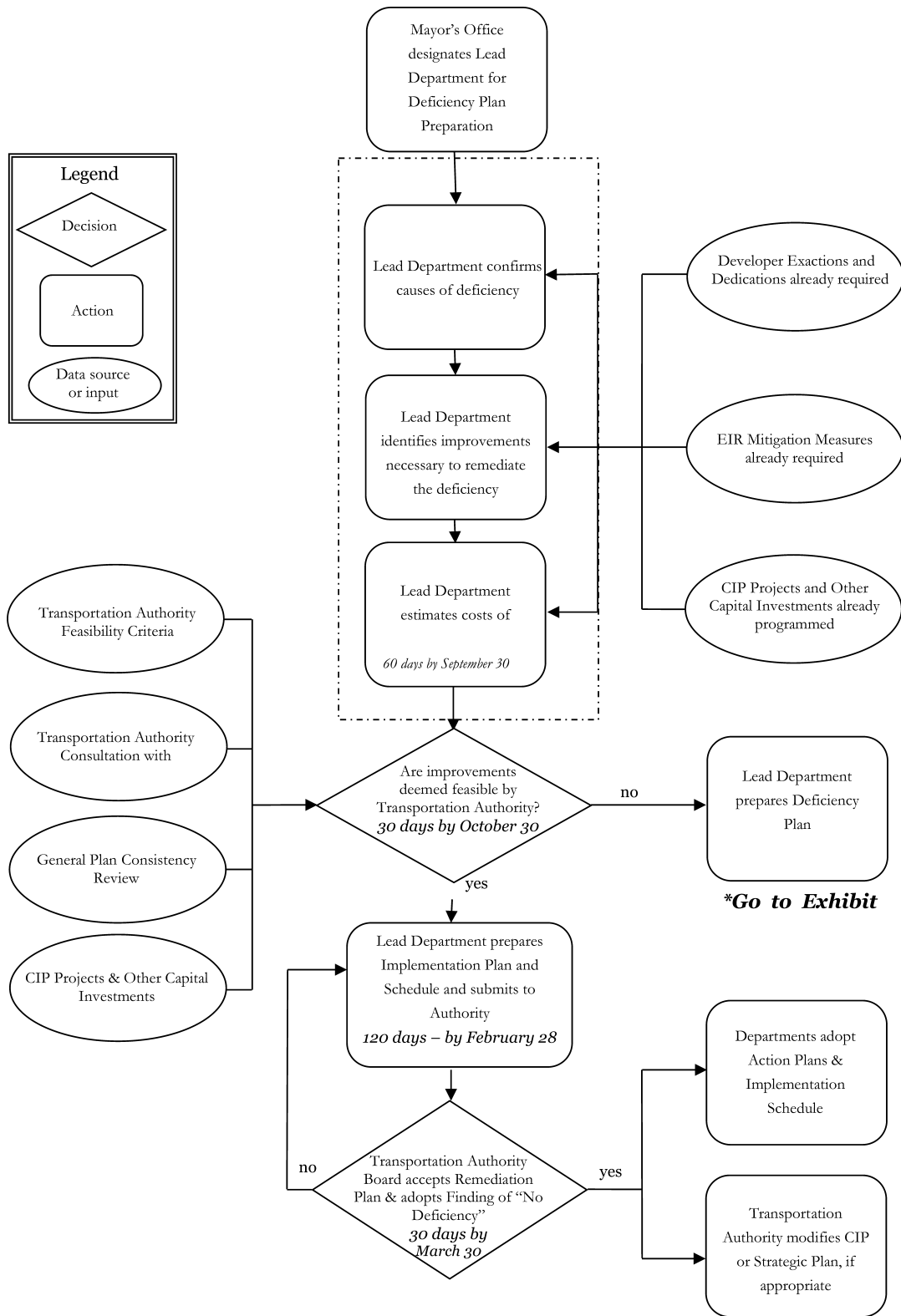
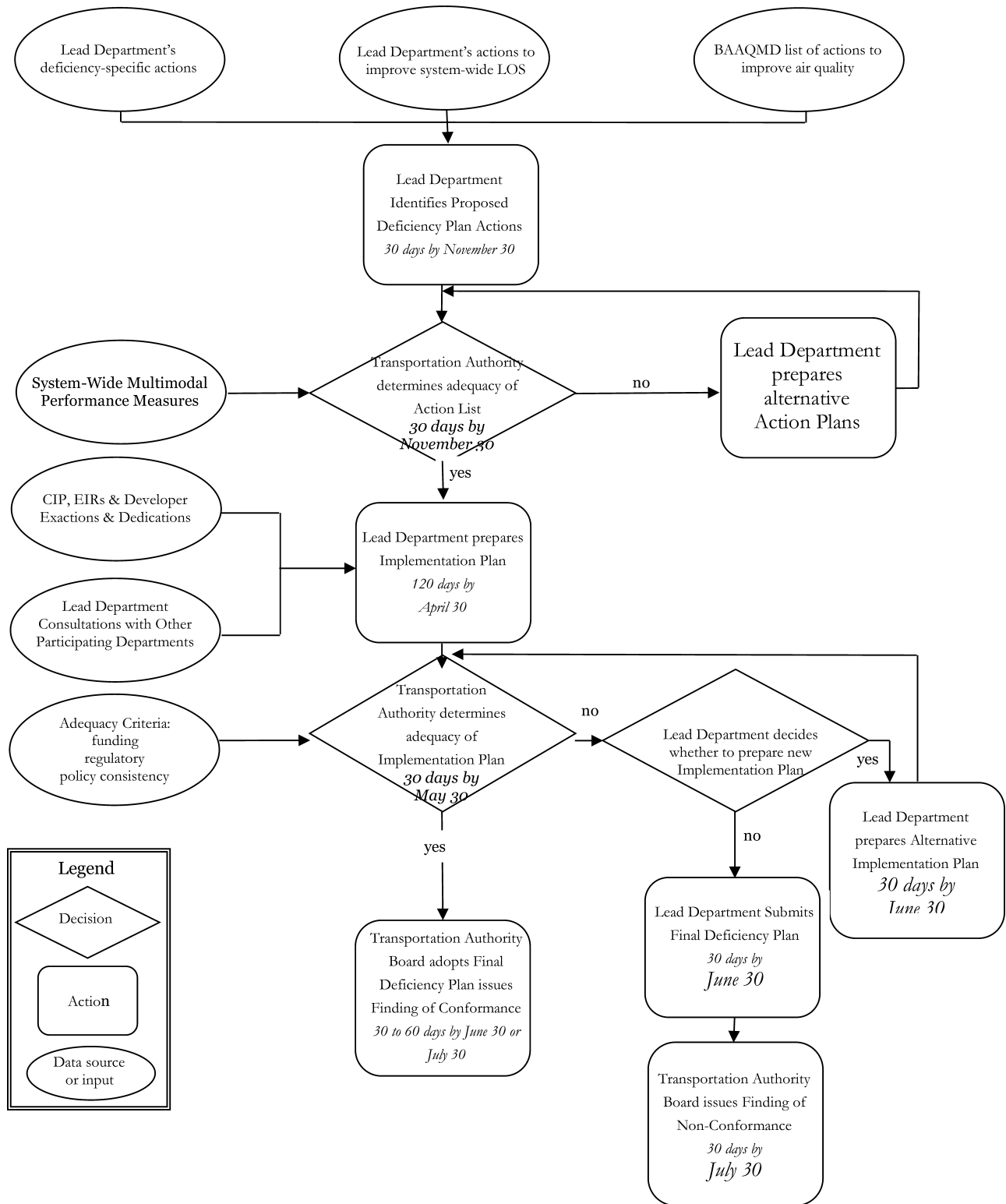


Figure A4-3. Deficiency Plan Evaluation and Approval



A4.3.4 ADEQUACY CRITERIA

The CMP legislation, as amended, includes three transit performance measures (in addition to the LOS performance measure) for the evaluation of current and future system performance and the effectiveness of Deficiency Action Plans (Government Code § 65089. (b)(2)): transit frequency, routing, and service coordination among separate operators.

As required by CMP legislation, the Transportation Authority has developed multimodal performance measures beyond the traditional roadway Level of Service (LOS) measures. Our emphasis has been on user-based measures that help explain mode choice in the City. The Transportation Authority Board adopted the first set of multimodal performance measures in August 1998 (see Chapter 4). These include bicycle and pedestrian safety, transit speed and reliability and other measures. After these measures have been further refined and fully tested, they will then be used to evaluate the proposed list of Deficiency Plan Actions. Additional measures may be developed in the future.

A4.3.5 IMPLEMENTATION PLAN

The Transportation Authority requires the lead department to prepare an Implementation Plan within 90 days of the Transportation Authority's finding as part of the Deficiency Plan Document. The Implementation Plan identifies the responsible implementing department(s) for each action, and the sources of funding.

I. Implementation Plan Development

The lead department is responsible for developing the Implementation Plan. For each action in the Deficiency Plan, the lead department must specify the following:

1. The final cost of the actions and the sources of capital (up-front) and operating (on-going) funds. Note any correspondence with EIR mitigation measures or CIP projects.
2. A monitoring program that conforms to CEQA monitoring requirements.
3. An implementation schedule. All actions must be implemented within the seven-year time horizon for the current CIP. If a Deficiency Plan action is programmed for funding in the sixth or seventh year of the CIP, it will need to be fully implemented within three years of its initiation in order to be considered a feasible action within the Deficiency Plan's ten-year horizon.
4. Identification of city departments responsible for the action's funding, implementation, and on-going operations.

-
5. Clear identification of all departments responsible for implementation, therefore, is essential for the Transportation Authority's approval of the Final Deficiency Plan. One way for partner agencies to demonstrate this would be through an interdepartmental agreement among all responsible implementing departments stating each department's agreement to fulfill their responsibilities for implementing Deficiency Plan actions.

II. Identification of Funding

The Implementation Plan must include a detailed funding plan.

III. Implementation Plan and Deficiency Plan Approval

Within 30 days of submittal by the lead department, the Transportation Authority will either accept or reject the Implementation Plan. The Transportation Authority will make its determination based on the required elements of the Implementation Plan discussed in Section A4.4.1. Implementation Plans without a funding plan will be rejected. Once the Transportation Authority has approved the Implementation Plan, the lead department will have additional 30 days to finalize and submit the Final Deficiency Plan for Transportation Authority Board approval. Upon submittal of the final Deficiency Plan by the lead department, the Transportation Authority Board will hold a noticed public meeting and either approve or reject it within 30 days. If the Transportation Authority rejects the Implementation Plan, the lead department may either propose an alternative Implementation Plan within 30 days, or choose to submit the Final Deficiency Plan with the Implementation Plan as is. In the latter case, the Transportation Authority will notify the Mayor's Office of its intent to reject the Final Deficiency Plan due to Implementation Plan inadequacy.

If the Transportation Authority Board rejects the Final Deficiency Plan and issues a finding of non-conformance, pursuant to the State law (Government Code 65089.5), the Transportation Authority must submit its findings to MTC and the State Controller for the withholding of State funds.

IV. Deficiency Plan Document Structure

A Deficiency Plan Report must include the following sections:

1.0 Introduction Identification of the Deficiency's Causes, including:

- 1.1 Description of the Deficiency (i.e., road segment);
 - 1.2 Description of the adjacent facilities;
 - 1.3 Analysis of the causes of the deficiency;
 - 1.4 Description of the existing traffic conditions within the boundaries;
-

- 1.5 Projection of future transportation conditions for at least the next 10 years; and
- 1.6 A map of the area, the deficiency, and adjacent facilities and transit routes.

2.0 Remediation Plan, consisting of:

- 2.1 An estimate of the extra roadway capacity needed to remove the deficiency;
- 2.2 An estimate of the total costs (operating and capital) of the capacity improvements; and
- 2.3 A description of improvements that are already programmed through individual project conditions of approval, the CIP, or developer exactions or dedications.

3.0 List of Actions, broken out into:

- 3.1 Deficiency-Specific Action; and
- 3.2 Global Actions To Improve System-wide LOS.

4.0 Implementation Plan, specifying the following:

- 4.1 The final cost of the actions and the sources of capital (up-front) and operating (on-going) funds;
- 4.2 A monitoring program to verify the action's implementation;
- 4.3 A schedule for implementation; and
- 4.4 Identification of city departments responsible for the action's funding, implementation, and on-going support/operation.

5.0 Identification of Other Departments' Responsibilities for Implementation

6.0 Identification of Funding

A4.4 Special Issues

The following sections discuss special circumstances where the Deficiency Plan process, as described in Section A4.3, may have to be modified. Treatment of these issues is not intended to be exhaustive.

A4.4.1 MULTI-COUNTY DEFICIENCY PLANS

Deficiencies may occur because of the activities of other counties or they may occur on a regional facility (e.g., the Bay Bridge). Under such circumstances, the Transportation Authority will take the lead in coordinating the preparation of a

Deficiency Plan, following MTC's process and mutual agreements with other agencies. More specifically, the Transportation Authority will coordinate with other congestion management agencies (CMAs) and regional agencies (e.g., MTC, BAAQMD, ABAG, etc.). The Transportation Authority may request the Mayor's Office to designate other city departments to prepare the Remediation Plan, Deficiency Plan Action List, or the Implementation Plan. Furthermore, other departments may be designated as the responsible agencies for the implementation of the Deficiency Plan.

A4.4.2 DEFICIENCY PLANS ADDRESSING MULTIPLE DEFICIENCIES

The Mayor's Office may request that the lead department prepare a Deficiency Plan that covers more than one deficient roadway segment.

Multiple deficiencies may be likely if an area or transportation corridor is impacted by large land use projects (e.g., Mission Bay), significant transportation infrastructure projects (e.g., demolition of the Central Freeway), or pronounced socioeconomic trends (e.g., increased commuting from the East Bay). When multiple deficiencies are within close geographical proximity, distributed along a single corridor (or parallel facility), or are functionally related, the Transportation Authority may encourage a single area-wide, or corridor Deficiency Plan.

The process would be similar to that described in Section A4.3. Nevertheless, the lead department must:

1. Review relevant EIRs for their assessment of impact and proposed mitigation measures;
2. Perform modeling of traffic within the area or corridor to determine the effectiveness of the Remediation Plan improvements;
3. Consider funding and/or regulatory feasibility of the proposed Implementation Plan; and
4. Coordinate with the CIP and other transportation programming and/or planning documents designed to address transportation planning for a subarea of the city, a specific corridor, or multiple facilities or modes.

A4.4.3 FUTURE DEFICIENCIES

The legislation does not require that local jurisdictions address future anticipated deficiencies. Deficiency Plans are only based on actual CMP network conditions.

Future changes to the transportation infrastructure or services may cause deficiencies. There are many potential causes of deficiencies, particularly changes to the transportation infrastructure in the City as well as land use changes.

The Planning Department is responsible for land use planning and development management. This role, stipulated in the City Charter, gives the Planning Department direct or oversight responsibility for every land use project from its initial design stages through environmental impact analysis, to final completion. Large-scale projects may have major impacts. Examples of such projects include, but are not limited to:

- Mission Bay;
- Rincon Point South Beach Redevelopment Area;
- Candlestick Point and Hunters Point Shipyard Development Plan; and
- Revised South of Market Specific Plan.

In addition, the Planning Department oversees preparation of Transportation Impact Analyses (TIAs) and its Office of Environmental Review (OER) coordinates CEQA review and EIR preparation for development projects. All of these documents are intended to anticipate the impacts of a proposed project on the transportation system; thus, they have direct relevance to the Deficiency Plan if a project's impacts cause a deficiency.

APPENDIX 5

Transit Frequency and Coverage Service Levels

There have been rapid changes in transit frequency and coverage service levels in transit operators across the Bay Area.

Muni

Muni updated its service network in 2022:

<https://www.sfmta.com/projects/2022-muni-service-network>.

BART

BART updated its service plan in September 2023:

<https://www.bart.gov/news/articles/2023/news20230427>.

Caltrain

The current Caltrain schedule as of Fall 2023 can be found at

<https://www.caltrain.com/news/caltrain-operate-new-schedule-starting-fall>.

Caltrain is undergoing electrification (slated for completion in Fall 2024)

and is proposing service improvements once electrification is complete:

<https://www.caltrain.com/news/caltrain-unveils-electrified-service-vision-2024>.

AC Transit

AC Transit Transbay routes provide service between San Francisco and the East Bay via the Bay Bridge. AC Transit is undergoing a comprehensive review (“AC Transit Realign”) of its network to respond to shifts in riders’ travel patterns, with its 5 phases slated to be complete in Fall 2024: <https://www.actransit.org/realign>.

Golden Gate Transit

San Francisco is served by both Golden Gate Transit buses and ferries.

Transit service standards can be found in their Short Range Transit Plan

(<https://www.goldengate.org/bus/history-research/publications>), the last version of which was adopted in December 2022 for Fiscal Years 2022/23 – 2027/28.

SamTrans

SamTrans is currently updating its Short Range Transit Plan for FY2023-28

beginning in March 2022. The plan is slated for Board approval in December 2023.

(https://www.samtrans.com/projects/samtrans_short_range_transit_plan)

APPENDIX 6

Transit Monitoring Methodology & Results

KEY TOPICS

- Methodology
- Transit Speed Results
- Discussion



Photo credit: SFMTA Photo Library

A6.1 Methodology

The transit speed monitoring was conducted using Automatic Vehicle Location (AVL) /Automatic Passenger Count (APC) data from the San Francisco Municipal Transportation Agency (SFMTA), which tracks transit speeds, boardings, and alightings on SFMTA buses. SFMTA rail vehicles are not included. SFMTA has APC counters on a significant portion of the bus fleet at any given time and rotates the counters between vehicles periodically to collect data on every bus run.

The APC data are valuable for detailed service planning purposes. For broader system performance monitoring and planning purposes, such as the CMP, the APC data can be aggregated to a weekday peak period and have a relatively large sample set. APC data have been used to report transit speeds since CMP 2011 cycle. In 2011, transit speeds were reported on CMP segments for the afternoon peak alone; since the 2013 CMP update, the monitoring effort included both morning and afternoon peak results.

In 2019, the format of the APC data were changed as the SFMTA implemented a new radio-based APC system. The most impactful change from the CMP monitoring perspective was that no records would be generated when a bus passes-by scheduled

bus stops, as opposed to generating interpolated time-tramps for the skipped stops as the older system did. To deal with this issue, the processing method was updated to base calculations on individual trips instead of transit stop pairs. This was done by first mapping transit stop pairs to CMP segments as previously did and then aggregating the speeds from the matched transit stop pairs to individual transit trips. Those trip level speeds were lastly processed to compute transit performance measures, including average speed, standard deviation, and coefficient of variation, for CMP segments during AM and PM periods. This approach better reflects overall transit speeds on a CMP segment, and is less susceptible to the impact of localized factors such as traffic signal between stop pairs.

During the analysis, the generated intermediate dataset provided stop-to-stop travel time and speed, inclusive of bus dwell time¹. Specifically, dwell time was assigned to the “upstream” stop: the segment-level data represent upstream stop-arrival point to downstream stop-arrival point. In this way, the processed data correspond with the travel time and through-speed experience by a transit rider as the rider passes multiple stops while on-board. (This is comparable to the manner in which automobile speed is reported by including fully-stopped intersection delay in the calculation of through-travel speed.). The stop-to-stop travel time results with inclusion of upstream dwell time are then aggregated to get travel time of transit trips that are overlapping with the CMP segments.

Following the above methodology, APC data collected on Muni’s bus (diesel and trolley coach) fleet in (the entire months of) April and May 2023 were analyzed. Muni light rail vehicles are not currently equipped with APCs, and were thus not included in the analysis. The raw APC transit data utilized corresponded to the same morning and afternoon peak periods as the Automobile LOS monitoring. The monitoring days were examined through a similar data cleaning process that considered the same special events, construction and weather events that informed the cleaning of the auto monitoring data.

A6.2 Results

Attachment 6-1 and Attachment 6-2 present the Average Transit Speeds for the morning and afternoon peak periods in the current CMP cycle. The AM and PM peak transit speeds from the previous CMP cycles are included for comparison.

Summary statistics for 2023 (Table A6-1) indicate the average speed decreased markedly since 2021 (during the midst of the COVID pandemic) from 11.2 / 11.1 mph

¹ Note that door dwell time was excluded for few bus stop pairs to filter out the layover time corresponding to end of the line operations.

to 8.9 / 8.0 mph (for the AM / PM peaks respectively), to speeds that are slightly higher than pre-COVID (8.7 / 7.7 mph, measured in 2019).

Table A6-1. Transit Results Summary Statistics

	NUMBER OF SEGMENTS	AVERAGE SPEED	STANDARD DEVIATION	MINIMUM SPEED	MAXIMUM SPEED
AM Peak Period	98	8.9	2.3	3.9	14.8
PM Peak Period	97	8.0	2.2	3.8	13.6

A6.3 Discussion

This section examine the transit speed variability/reliability, and compares the results between 2019 and 2021 and between 2021 and 2023.

A6.3.1 TRANSIT SPEED VARIABILITY/RELIABILITY

In order to fairly compare the variability of speeds for segments that are fast on average and those that are slow on average, a reliability measure is needed that would not favor one or the other. If the standard deviation alone was used, segments that have higher absolute standard deviations (i.e. most commonly segments with higher average speeds) would be ranked higher than segments that are slower on average. To prevent this, the Coefficient of Variation (CV), the ratio between the standard deviation and the average, is used to measure reliability. The CV is expressed as a percentage of the mean speed, thus both segments with high and low average speeds can be compared on the same scale.

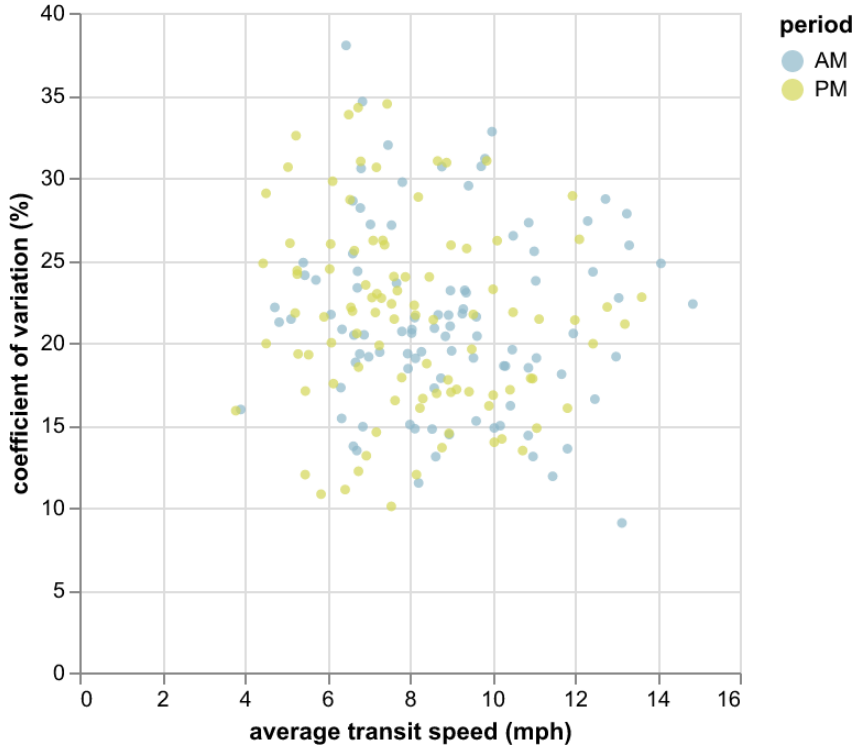
Since it is theoretically possible for segments to be reliably fast, reliably slow, unreliably fast, or unreliably slow, the ideal comparison of these results would show the results in two dimensions at the same time, as is shown in Figure A6-1 below. Most CMP segments have a transit speed between 4 and 14 mph, with a coefficient of variation between 10% and 35%. The figure shows no clear functional relationship between transit reliability (the coefficient of variation) and its speed.

In 2023, 8% of monitored segments had a CV above 30% in the AM peak period, whereas for the PM peak period it was 10%. This is lower than in 2021, when the same metric was at 13% (AM peak) and 16% (PM peak), but still higher than the 6% (AM peak) and 5% (PM peak) in 2019.

The most unreliable segment in the AM period was Folsom from 4th to 1st (CV = 38.0%), followed by Broadway from Powell to Montgomery (CV = 34.6%). The two most unreliable segments in the PM peak period were Mission/Otis from 9th to 14th

(CV = 34.5%) and Clay from Kearny to Davis (CV = 34.3%). None of the unreliable (CV > 30%) segments in 2023 had a low sample size (<50).

Figure A6-1. Transit Reliability vs Speed



[Download chart data \(CSV\)](#)

A6.3.2 COMPARISON OF RESULTS BETWEEN 2019 AND 2023 AND BETWEEN 2021 AND 2023

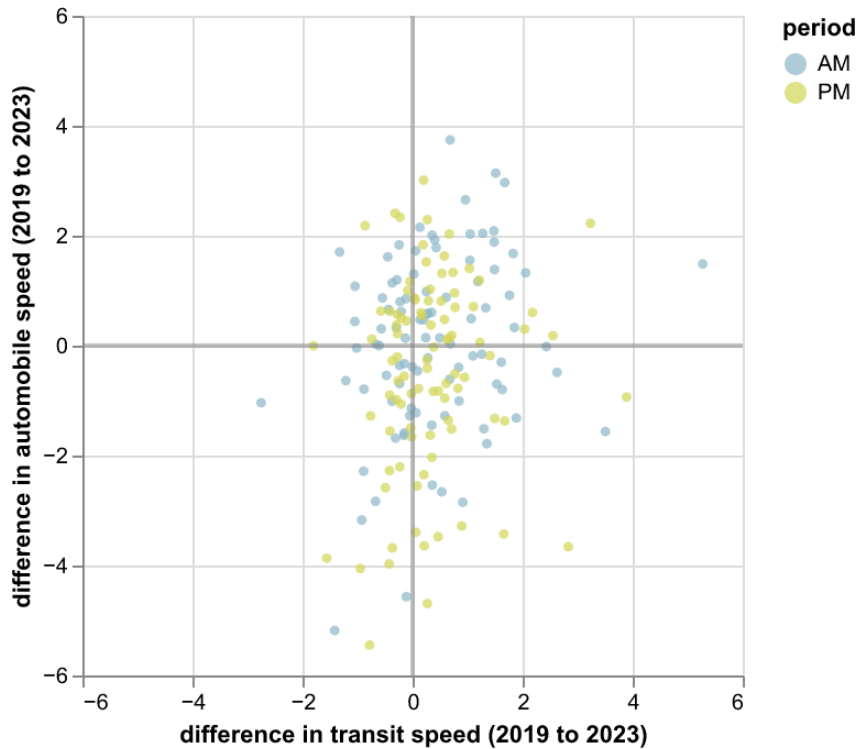
In general, transit speeds on each CMP segment in 2023 are close to that in 2019 (with the full range of difference being a change of -2/+4 mph from 2019 to 2023). The 2023 transit speeds on each CMP segment are in general slower than that in 2021 (most of the segment speeds are slower by up to 2mph, with the full range of difference being a change of -4.5/+1.5 mph from 2021 to 2023).

Figure A6-2 and Figure A6-3 below illustrate the changes in both auto and transit speeds at individual segment level in both AM and PM peak periods between 2019 and 2023 and between 2021 and 2023. Table A6-2 and Table A6-3 show the number of segment within each quadrant for the two figures. The changes can be broken into four scenarios, represented by four quadrants on the graph, as divided by the two half-axes (marked in grey). The quadrant numbering I-IV goes counter-clockwise starting from the upper right quadrant. Data in quadrant I (upper right) represent an increase in both auto and transit speeds, and data in quadrant III represent a decrease in both auto and transit speeds.

Between 2019 and 2023, more than half of all segments have an increased transit speed (quadrants I and IV, upper and lower right). Less than a quarter of the segments have a decrease in both automobile and transit speed (quadrant III, lower left). This indicates a general increase in speed for both automobiles and transit compared to pre-COVID conditions, with the increase more pronounced for transit than automobiles.

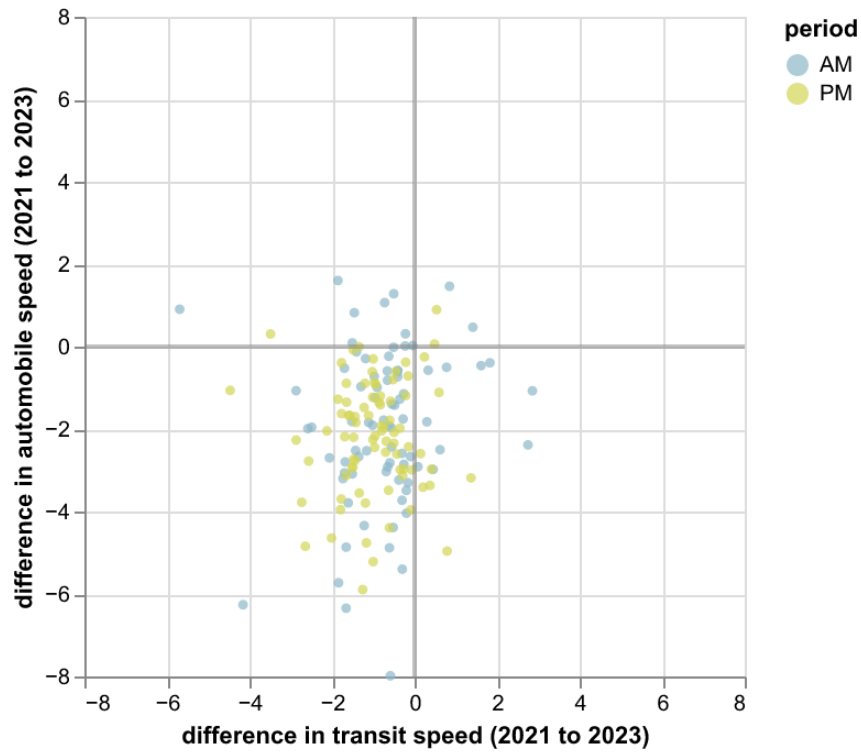
Between 2021 and 2023, the vast majority of segments have a decrease in both automobile and transit speed (quadrant III, lower left), as people began to return to pre-pandemic activity levels.

Figure A6-2. Change in Auto & Transit Speeds between 2019 and 2023



[Download chart data \(CSV\)](#)

Figure A6-3. Change in Auto & Transit Speeds between 2021 and 2023



[Download chart data \(CSV\)](#)

Table A6-2. Number of Segments Within Each Quadrant (Between 2019 and 2023)

PEAK PERIOD	I	II	III	IV
AM	34	17	20	22
PM	30	13	21	28
Both peak periods	64	30	41	50

Table A6-3. Number of Segments Within Each Quadrant (Between 2021 and 2023)

PEAK PERIOD	I	II	III	IV
AM	2	9	58	10
PM	2	1	70	8
Both peak periods	4	10	128	18

NAME	FROM	TO	DIR	2006				2007				2009				2011				2013				2015				2017				2019				2021				2023							
				AVG. TRANSIT SPEED (MPH)	S.D. TRANSIT SPEED (MPH)	COEFFICIENT OF VARIATION	AUTO-TRANSIT SPEED RATIO	AVG. TRANSIT SPEED (MPH)	S.D. TRANSIT SPEED (MPH)	COEFFICIENT OF VARIATION	AUTO-TRANSIT SPEED RATIO	AVG. TRANSIT SPEED (MPH)	S.D. TRANSIT SPEED (MPH)	COEFFICIENT OF VARIATION	AUTO-TRANSIT SPEED RATIO	AVG. TRANSIT SPEED (MPH)	S.D. TRANSIT SPEED (MPH)	COEFFICIENT OF VARIATION	AUTO-TRANSIT SPEED RATIO	AVG. TRANSIT SPEED (MPH)	S.D. TRANSIT SPEED (MPH)	COEFFICIENT OF VARIATION	AUTO-TRANSIT SPEED RATIO	AVG. TRANSIT SPEED (MPH)	S.D. TRANSIT SPEED (MPH)	COEFFICIENT OF VARIATION	AUTO-TRANSIT SPEED RATIO	AVG. TRANSIT SPEED (MPH)	S.D. TRANSIT SPEED (MPH)	COEFFICIENT OF VARIATION	AUTO-TRANSIT SPEED RATIO	AVG. TRANSIT SPEED (MPH)	S.D. TRANSIT SPEED (MPH)	COEFFICIENT OF VARIATION	AUTO-TRANSIT SPEED RATIO												
Mission/Otis	Sickles	Ocean	N	9.3		2.8		8.1		2.7		9.6		2.3		10.0	2.4	24.0	2.2	9.5	1.0	10.5	1.8	9.9	0.6	6.1	1.4	9.9	6.0	60.6	1.4	9.6	1.6	16.3	1.2	12.5	2.3	18.7	1.4	11.1	2.1	19.1	1.6				
	Ocean	Cesar Chavez	N	9.1		2.0		8.0		1.8		8.9		2.2		9.4	2.1	22.3	1.8	7.7	0.5	6.5	1.8	7.5	0.7	9.3	1.7	8.9	1.3	14.6	1.3	8.6	1.5	16.9	1.4	11.8	2.0	16.7	1.5	10.3	1.9	18.6	1.6				
	Cesar Chavez	14th	N	8.1		1.7		7.7		1.9		7.6		2.4		8.1	1.9	23.2	1.9	8.0	0.6	7.5	1.7	7.8	0.4	5.1	1.6	9.1	1.3	14.4	1.3	8.7	1.5	17.2	1.1	9.1	1.6	17.3	1.5	8.6	1.5	17.2	1.5				
	14th	9th	N	6.7		1.6		6.2		1.9		6.9		2.2		7.8	2.2	28.3	2.1	5.8	0.8	13.8	2.5	5.4	0.5	9.3	2.3	6.5	3.4	52.1	1.6	6.4	1.3	20.9	1.5	7.1	1.5	21.2	2.0	6.1	1.3	21.7	2.0				
	9th	3rd	N	9.1		2.0		8.5		1.5		8.7		2.0		9.5	1.9	20.2	1.7	9.6	0.8	8.3	1.7	8.4	1.2	14.3	1.6	10.6	1.5	14.1	1.3	9.6	1.9	19.4	1.4	9.4	1.6	17.0	1.6	9.0	1.3	14.4	1.6				
	3rd	Embarcadero	N	5.5		2.1		5.2		2.0		8.0		2.1		6.9	2.1	30.7	1.8	6.7	0.9	13.4	2.2	6.8	0.9	13.2	1.5	6.1	1.7	27.9	1.2	6.0	1.4	23.3	1.2	7.0	1.7	24.7	1.8	6.4	1.3	20.8	1.6				
	Embarcadero	3rd	S	6.9		1.9		6.2		2.1		7.7		1.8		4.7	3.3	69.6	2.2	3.8	1.3	34.2	3.9	6.2	0.8	12.9	1.7	6.4	2.4	37.6	1.4	5.2	1.1	22.2	1.6	5.6	2.0	36.7	2.4	5.5	1.3	24.1	2.0				
	3rd	9th	S	9.1		1.8		8.2		2.0		8.8		1.7		9.6	2.4	25.3	1.6	8.2	1.0	12.2	2.0	9.3	0.9	9.7	1.5	11.4	1.6	14.4	1.1	9.6	1.8	18.5	1.3	11.2	2.6	23.2	1.3	9.4	2.2	23.0	1.7				
	9th	14th	S	7.9		1.8		7.0		2.2		7.9		2.0		8.4	2.3	27.4	2.3	6.8	0.9	13.2	2.1	6.8	0.7	10.3	1.8	3.6	0.8	21.3	2.9							8.6	1.8	20.9	1.4						
	14th	Cesar Chavez	S	8.7		1.8		7.8		1.7		8.4		2.1		8.8	2.1	24.1	1.7	8.6	0.9	10.5	1.6	8.9	0.5	5.6	1.5	9.3	1.8	19.6	1.5	10.6	2.1	20.2	1.2	11.0	2.3	21.2	1.4	9.5	1.8	19.1	1.7				
	Cesar Chavez	Ocean	S	10.6		1.8		9.6		1.7		9.8		2.1		9.8	2.1	21.8	1.9	8.7	0.9	10.3	1.9	8.7	0.5	5.7	1.7	10.5	1.8	17.4	1.2	10.4	1.9	18.3	1.2	11.7	2.3	19.5	1.4	10.5	2.1	19.6	1.6				
Ocean	Sickles	S	12.3		1.7		10.2		2.5		13.4		1.7		12.1	2.3	19.4	1.8	10.1	0.9	8.9	1.7	9.6	0.9	9.4	1.6	12.7	1.3	10.4	1.3	11.5	2.3	20.5	1.4	12.0	2.0	16.8	1.5	10.4	1.7	16.2	1.7					
Montgomery	Broadway	Bush	S												6.2	1.7	27.4	1.8																													
North Point	Van Ness	Columbus	E	8.7		2.2		5.9		2.2		11.0		1.6		10.0	3.2	31.8	1.9	9.9	1.7	17.2	1.5	10.2	2.0	19.6	1.3	9.5	0.9	9.9	1.4	7.7	2.1	27.2	2.2					7.5	2.4	32.0	2.2				
	Columbus	Embarcadero	E									11.2		1.7		10.8	2.6	23.9	2.0	7.9	3.6	45.6	2.7	9.4	2.7	28.7	1.3	11.0	1.8	16.5	1.2	9.3	3.4	37.0	1.5	9.8	4.1	41.3	1.7								
	Embarcadero	Columbus	W									11.1		1.4		6.5	2.7	41.2	2.8	9.2	1.9	20.7	1.6	6.4	1.4	21.9	2.2	7.6	1.4	18.8	1.6																
	Columbus	Van Ness	W	9.7		1.8		7.7		2.2		9.8		1.7		7.7	2.2	28.7	2.1	7.5	1.2	16.0	2.1	7.7	1.9	24.7	1.6	8.0	0.7	8.2	1.5	7.8	1.9	24.9	1.1	7.3	2.2	29.6	1.8	8.1	1.7	21.5	1.6				
Oak	Stanyan	Divisadero	E																																												
	Divisadero	Fillmore	E																																												
	Fillmore	Laguna	E																																												
	Laguna	Franklin	E																																												
Ocean	19th Ave	Miramar	E	12.2		1.2		9.4		1.4																																					
	Miramar	Howth	E	10.0		1.3		8.2		1.6					1.7	0.9	57.0	6.9	5.5	1.6	29.1	2.6	5.5	0.6	10.9	2.2	5.7	0.6	11.1	2.1	6.7	1.5	21.8	1.8	8.7	2.3	26.2	1.7	7.6	2.1	27.1	1.7					
	Howth	Miramar	W	9.0		1.5		7.4		1.5					8.6	2.9	34.2	1.8	7.1	1.6	22.5	1.9	5.7	1.6	28.1	2.0	6.0	0.8	13.7	1.7	7.4	1.4	18.7	1.5	6.8	1.7	24.3	2.2									
	Miramar	19th Ave	W	9.6		1.4		8.0		1.7																																					
Octavia	Market	Fell	N																																												
	Fell	Market	S																																												
O'Farrell	Gough	Mason	E									9.4		1.4		8.1	2.0	24.9	1.5	9.1	0.8	8.8	1.6	8.6	0.8	9.3	1.4	6.8	2.1	31.0	1.5	9.2	1.6	17.6	1.0	9.2	1.7	18.0	1.4	9.0	2.1	23.2	1.3				
	Mason	Market	E									7.6		1.5		6.3	1.8	28.5	1.5	10.1	1.0	9.9	1.3	7.0	1.6	22.9	1.4	6.4	3.5	55.4	1.4	7.0	1.7	24.3	1.2	9.2	1.9	21.1	1.4								
Pine	Market	Kearny	W																																												
	Kearny	Leavenworth	W																																												
	Leavenworth	Franklin	W																																												
	Franklin	Presidio	W																																												
Potrero	Cesar Chavez	21st	N	7.1		2.5		6.4		4.2		7.5		2.8		9.2	2.8	30.6	2.5	8.3	2.0	24.1	1.8	7.1	1.0	14.1	1.5	7.4	1.3	17.5	1.9	6.9	1.3	18.7	2.4	7.2	1.3	18.1	2.1	6.8	1.3	19.3	2.0				
	21st	Division	N	11.7		1.5		10.9		2.4		9.9		2.3		9.9	2.5	25.5	2.5	9.3	1.0	10.8	2.0	9.3	1.9	20.4	2.1	9.5	1.1	11.7	1.2	9.7	2.4	25.1	1.5	11.9	3.7	31.3	1.6	9.3	2.0	21.8	1.8				
	Division	21st	S	9.4		2.3		11.1		1.8		10.4		2.3		10.5	2.5	23.8	1.8	10.2	1.6	15.7	1.9	10.0	1.4	14.0	1.4	9.3	0.8	8.8	1.7	9.7	1.6	16.8	1.6	10.4	2.6	24.6	1.7	9.6	2.0	20.4	1.7				

NAME	FROM	TO	DIR	2006				2007				2009				2011				2013				2015				2017				2019				2021				2023			
				AVG. TRANSIT SPEED (MPH)	S.D. TRANSIT SPEED (MPH)	COEFFICIENT OF VARIATION	AUTO-TRANSIT SPEED RATIO	AVG. TRANSIT SPEED (MPH)	S.D. TRANSIT SPEED (MPH)	COEFFICIENT OF VARIATION	AUTO-TRANSIT SPEED RATIO	AVG. TRANSIT SPEED (MPH)	S.D. TRANSIT SPEED (MPH)	COEFFICIENT OF VARIATION	AUTO-TRANSIT SPEED RATIO	AVG. TRANSIT SPEED (MPH)	S.D. TRANSIT SPEED (MPH)	COEFFICIENT OF VARIATION	AUTO-TRANSIT SPEED RATIO	AVG. TRANSIT SPEED (MPH)	S.D. TRANSIT SPEED (MPH)	COEFFICIENT OF VARIATION	AUTO-TRANSIT SPEED RATIO	AVG. TRANSIT SPEED (MPH)	S.D. TRANSIT SPEED (MPH)	COEFFICIENT OF VARIATION	AUTO-TRANSIT SPEED RATIO	AVG. TRANSIT SPEED (MPH)	S.D. TRANSIT SPEED (MPH)	COEFFICIENT OF VARIATION	AUTO-TRANSIT SPEED RATIO	AVG. TRANSIT SPEED (MPH)	S.D. TRANSIT SPEED (MPH)	COEFFICIENT OF VARIATION	AUTO-TRANSIT SPEED RATIO								
Sutter	Divisadero	Gough	E	11.0	1.4	9.1	1.6						8.2	2.1	25.4	1.8	9.0	2.3	25.6	1.8	9.0	1.5	16.7	1.2	8.8	0.7	7.6	1.3	8.2	1.4	16.7	1.3			8.2	0.9	11.5	1.7					
	Market	Mason	W	7.3	1.5	6.7	2.5	7.1		2.5	6.6	2.3	35.3	2.7	7.2	1.4	19.4	1.9	6.6	1.7	25.8	1.9	7.3	0.9	12.6	1.2	5.9	1.5	24.5	1.5			7.0	1.3	19.1	1.4							
	Mason	Gough	W	7.1	1.8	6.8	1.3	7.4		1.2	6.4	1.6	25.2	1.6	6.6	0.7	10.6	1.7	6.8	1.0	14.7	1.6	6.7	0.4	6.5	1.7	6.0	0.9	15.6	1.6			6.4	1.0	15.4	1.8							
	Gough	Divisadero	W	10.2	1.5	9.0	1.7	8.8		1.7	7.7	2.1	27.7	1.8	8.1	0.8	9.9	1.7	8.7	1.2	13.8	1.3	8.7	0.7	7.9	1.3	7.9	1.3	16.8	1.5			8.1	1.2	14.8	1.6							
Townsend	7th	2nd	E					10.5		1.9	8.9	2.4	26.3	1.9	8.2	1.3	15.9	2.1	8.4	1.5	17.9	1.7	8.0	1.0	12.8	1.4	8.1	2.3	28.2	1.4													
	2nd	7th	W					11.0		1.7	10.3	2.8	26.7	1.3	9.7	1.5	15.5	1.8	9.2	3.9	42.4	1.3	8.2	1.3	16.3	1.3	9.6	1.3	13.3	1.0													
Turk	Stanyan	Divisadero	E	10.2	1.7	9.3	2.2	10.7		1.7	9.7	3.2	33.1	1.8	9.3	2.8	30.1	1.9	7.4	2.1	28.4	2.1	8.5	0.6	7.6	1.5	8.5	1.7	20.2	1.4			8.8	1.6	17.8	1.8							
	Market	Hyde	W					6.1		2.4	6.0	1.9	30.9	2.1	6.3	1.3	20.6	1.6	7.0	1.3	18.6	1.8	6.4	2.2	34.0	1.6	4.5	0.7	16.0	1.9			3.9	0.6	15.9	2.3							
	Hyde	Gough	W								6.7	1.8	27.1	1.9	9.7	2.8	28.9	1.5																									
	Gough	Divisadero	W																																								
Van Ness/ S Van Ness	Divisadero	Stanyan	W	11.4	1.5	10.9	1.8	11.6		1.8	10.8	3.3	30.8	1.5	11.4	1.3	11.4	1.6	9.9	1.8	18.2	1.9	10.4	1.5	14.8	1.6	9.9	1.9	19.6	1.8			9.3	2.0	22.0	2.0							
	Cesar Chavez	13th	N																																								
	13th	Golden Gate	N	6.1	1.9	6.1	2.4	6.8		2.2	6.8	1.9	28.4	3.0	6.7	0.8	11.9	2.1	6.4	0.8	12.5	2.0	6.8	0.8	11.2	1.3	7.1	1.7	24.0	1.3	7.6	2.6	33.6	1.6									
	Golden Gate	Washington	N	5.7	2.0	5.9	2.0	5.8		2.6	5.4	1.3	24.6	3.1	5.4	0.4	7.4	2.2	5.4	0.3	5.6	2.1	6.2	0.4	6.8	1.6	6.4	0.7	11.0	1.4	6.4	1.2	18.4	1.9	8.1	1.7	20.6	1.5					
	Washington	Lombard	N	6.6	1.4	6.6	1.5	7.2		1.9	6.5	2.0	30.3	1.7	5.3	0.6	11.3	2.5	5.2	0.4	7.7	2.4	5.1	0.5	10.0	2.0	4.9	0.7	14.4	1.8	5.2	1.0	18.9	2.4									
	Lombard	Washington	S	7.0	1.8	7.7	2.3	6.9		2.4	6.8	2.5	37.1	2.4	7.0	0.6	8.6	1.7	6.6	0.9	13.6	2.0	8.0	0.9	11.0	1.4	7.9	1.7	21.8	1.5	8.4	2.5	29.4	1.9	7.8	1.6	20.7	1.0					
	Washington	Golden Gate	S	6.0	2.7	6.4	2.7	6.7		3.2	6.2	2.4	39.1	3.5	5.9	0.7	11.9	2.4	5.7	0.4	7.0	2.2	6.0	0.6	10.2	1.9	6.4	1.5	23.2	2.2	7.7	1.4	18.8	2.1	8.0	1.2	15.0	1.8					
Washington	13th	Cesar Chavez	S											6.5	2.1	31.9	2.0																										
	Drumm	Kearny	W								7.7	2.6	33.5	1.7																													
West Portal	Sloat	Ulloa	N	7.9	2.4	7.1	2.2			7.2	2.5	34.8	2.3	9.7	2.3	23.7	1.5	11.4	1.9	16.7	1.4	10.6	1.4	12.8	1.1					9.2	3.2	34.8	1.6										
	Ulloa	Sloat	S	10.6	1.5	8.1	1.9			4.7	1.4	30.8	3.7	11.2	1.8	16.1	1.5	7.0	1.8	25.7	2.1	6.3	1.1	18.1	2.5	7.7	2.2	28.1	2.1	6.9	2.1	30.4	2.0										
I-280	Junipero Serra	Weldon	E																																								
	Weldon	6th/Brannan	N																																								
US-101	County Line	Cortland	N																																								
	Cortland	I-80	N																																								
I-80	I-80	Market	N																																								
	Treasure Island	Fremont Exit	W																																								
I-280	Fremont Exit	US-101	W																																								
	6th/Brannan	Weldon	S																																								
US-101	Weldon	Junipero Serra	S																																								
	Market	I-80	S																																								
I-80	I-80	Cortland	S																																								
	Cortland	Monster Park Exit	S																																								
I-80	US-101	Fremont Exit	E																																								
	Fremont Exit	Treasure Island	E																																								

NAME	FROM	TO	DIR	2006				2007				2009				2011				2013				2015				2017				2019				2021				2023			
				AVG. TRANSIT SPEED (MPH)	S.D. TRANSIT SPEED (MPH)	COEFFICIENT OF VARIATION	AUTO-TRANSIT SPEED RATIO	AVG. TRANSIT SPEED (MPH)	S.D. TRANSIT SPEED (MPH)	COEFFICIENT OF VARIATION	AUTO-TRANSIT SPEED RATIO	AVG. TRANSIT SPEED (MPH)	S.D. TRANSIT SPEED (MPH)	COEFFICIENT OF VARIATION	AUTO-TRANSIT SPEED RATIO	AVG. TRANSIT SPEED (MPH)	S.D. TRANSIT SPEED (MPH)	COEFFICIENT OF VARIATION	AUTO-TRANSIT SPEED RATIO	AVG. TRANSIT SPEED (MPH)	S.D. TRANSIT SPEED (MPH)	COEFFICIENT OF VARIATION	AUTO-TRANSIT SPEED RATIO	AVG. TRANSIT SPEED (MPH)	S.D. TRANSIT SPEED (MPH)	COEFFICIENT OF VARIATION	AUTO-TRANSIT SPEED RATIO	AVG. TRANSIT SPEED (MPH)	S.D. TRANSIT SPEED (MPH)	COEFFICIENT OF VARIATION	AUTO-TRANSIT SPEED RATIO	AVG. TRANSIT SPEED (MPH)	S.D. TRANSIT SPEED (MPH)	COEFFICIENT OF VARIATION	AUTO-TRANSIT SPEED RATIO								
Mission/Otis	Sickles	Ocean	N	9.4		2.4	7.1		2.8	10.0		2.2	10.2	2.4	23.9	2.0	7.2	1.7	23.6	2.4	9.8	0.5	5.1	1.4	12.1	1.2	9.9	1.2	10.2	1.7	16.8	1.2	11.9	2.0	16.8	1.4	10.4	1.8	17.1	1.6			
	Ocean	Cesar Chavez	N	8.8		2.2	5.3		2.9	9.0		2.0	9.1	2.1	22.6	1.8	8.1	0.4	4.9	1.7	8.2	0.4	4.9	1.7	9.7	1.8	18.9	1.4	9.4	1.6	17.5	1.4	11.8	2.1	17.5	1.4	9.9	1.6	16.2	1.5			
	Cesar Chavez	14th	N	7.0		1.8	7.1		1.9	7.1		1.9	7.1	1.7	24.4	2.0	6.8	0.4	5.9	1.7	6.8	0.3	4.4	1.6	7.9	0.7	8.8	1.2	7.6	1.2	16.3	1.2	8.2	1.2	15.0	1.5	7.2	1.0	14.6	1.6			
	14th	9th	N	6.6		1.9	5.7		2.2	7.5		1.8	7.4	2.1	28.4	1.7	5.4	0.6	11.1	2.7	5.4	0.9	16.7	2.5	3.8	1.3	34.1	2.4	5.4	1.1	20.3	1.7	7.0	1.7	23.9	1.9	6.1	1.2	20.0	2.1			
	9th	3rd	N	8.5		1.5	6.4		2.2	9.1		1.5	8.0	1.8	22.3	1.6	8.1	0.5	6.2	1.9	7.0	0.7	10.0	1.5	7.9	1.1	14.4	1.3	7.0	1.4	20.8	1.4	9.1	1.9	21.2	1.5	7.6	1.8	24.0	1.5			
	3rd	Embarcadero	N	5.6		1.4	6.5		1.4	8.2		1.6	6.9	2.3	33.5	1.6	6.8	1.3	19.1	2.1	6.0	1.6	26.7	1.4	7.6	2.2	29.5	0.9	5.0	1.4	28.5	1.2	6.6	2.0	30.7	1.8	5.2	1.7	32.5	1.6			
	Embarcadero	3rd	S	7.0		1.9	8.6		1.3	7.1		2.0	4.0	3.6	89.9	2.8	3.5	0.7	20.0	3.7	6.9	0.9	13.0	1.3	8.9	2.7	30.0	0.8	4.8	1.0	20.1	1.6	5.7	3.2	55.6	2.3	4.5	1.3	29.1	2.0			
	3rd	9th	S	8.4		2.2	4.2		3.1	7.6		2.0	7.8	2.1	27.5	1.9	6.9	0.8	11.6	2.1	7.0	0.8	11.4	1.6	9.8	1.2	12.5	1.2	7.5	1.6	21.8	1.4	9.8	2.0	20.6	1.3	8.1	1.8	21.7	1.4			
	9th	14th	S	6.7		1.9	5.7		2.3	6.8		2.0	7.2	2.1	29.1	1.9	4.9	1.0	20.4	2.5	5.6	0.8	14.3	1.9	2.1	0.5	21.8	5.0							7.5	2.6	34.5	1.2					
	14th	Cesar Chavez	S	6.5		2.0	5.4		2.5	6.6		2.3	6.9	1.7	24.3	2.0	6.6	0.6	9.1	1.9	6.7	0.3	4.5	1.7	7.3	0.9	11.7	1.4	7.9	1.6	19.8	1.2	9.1	1.6	17.3	1.5	7.6	1.3	16.5	1.6			
	Cesar Chavez	Ocean	S	8.2		1.8	7.5		1.9	8.1		1.7	8.2	1.9	23.2	1.9	7.2	0.4	5.6	1.8	7.0	0.4	5.7	1.7	9.1	1.3	14.6	1.2	8.4	1.5	17.2	1.2	9.8	1.7	16.9	1.5	9.0	1.5	17.0	1.6			
	Ocean	Sickles	S	9.7		2.2	9.3		1.8	10.9		1.9	9.8	2.1	21.2	2.0	9.0	0.5	5.6	1.8	8.5	0.6	7.1	1.6	8.8	1.8	19.9	1.6	9.1	1.8	19.4	1.4	10.8	2.0	18.5	1.6	9.0	2.3	25.9	1.9			
Montgomery	Broadway	Bush	S										6.8	2.1	30.7	1.1																											
North Point	Van Ness	Columbus	E	6.8		1.7	6.1		2.5	8.9		1.7	7.8	2.8	35.5	1.8	2.7	0.9	33.3	3.4	8.0	1.5	18.8	1.1	8.2	0.9	11.1	1.2	5.9	2.5	42.7	2.2	6.6	3.3	49.0	2.3	6.1	1.8	29.8	2.2			
	Columbus	Embarcadero	E										9.6																														
	Embarcadero	Columbus	W										10.3																														
	Columbus	Van Ness	W	7.4		2.6	5.5		2.3	8.2		2.0	5.6	2.2	39.3	2.4	5.2	1.2	23.1	2.0	5.7	1.1	19.3	2.3	6.1	0.7	12.2	2.0	6.6	2.3	35.0	1.4	7.8	2.9	37.2	1.9	6.8	2.1	31.0	2.0			
Oak	Stanyan	Divisadero	E																																								
	Divisadero	Fillmore	E																																								
	Fillmore	Laguna	E																																								
	Laguna	Franklin	E																																								
Ocean	19th Ave	Miramar	E	9.5		1.3	5.5		2.7																																		
	Miramar	Howth	E	9.0		1.6	5.4		2.5			1.5	0.9	59.2	8.6	5.4	1.1	20.4	2.6	5.5	0.7	12.7	2.0	6.0	0.6	9.9	1.8	7.3	1.9	25.6	1.4	8.4	2.3	26.8	1.6	7.6	1.7	22.4	1.6				
	Howth	Miramar	W	8.3		1.0	6.0		1.8			8.4	2.3	27.5	1.4	5.5	1.2	21.8	2.3	4.3	0.6	14.0	2.0	4.8	1.1	22.1	1.7	6.1	1.1	18.2	1.3	5.2	2.1	39.7	2.7								
	Miramar	19th Ave	W	9.5		1.3	7.6		2.0																																		
Octavia	Market	Fell	N																																								
	Fell	Market	S																																								
O'Farrell	Gough	Mason	E						8.7		1.3	7.7	1.8	23.4	1.5	8.5	0.7	8.2	1.6	8.0	0.9	11.3	1.4	4.6	1.8	38.2	1.9	8.6	1.5	17.4	1.0	8.9	1.9	21.1	1.3	8.7	2.7	31.0	1.2				
	Mason	Market	E						6.9		1.3	5.7	1.7	30.6	1.4	8.1	1.1	13.6	1.5	5.3	1.1	20.8	1.6	5.3	3.1	57.7	1.3	5.7	1.5	26.2	1.3	8.1	1.9	23.7	1.4								
Pine	Market	Kearny	W																		8.9	4.2	47.2	0.8	6.0	1.1	18.5	0.9	4.7	1.3	26.6	1.4											
	Kearny	Leavenworth	W																																								
	Leavenworth	Franklin	W																																								
	Franklin	Presidio	W																																								
Potrero	Cesar Chavez	21st	N	6.4		2.7	5.8		4.1	7.3		2.6	8.9	2.3	25.7	2.4	8.4	1.6	19.0	1.8	7.9	0.9	11.4	1.0	7.1	1.6	22.7	1.8	6.4	1.5	23.1	2.2	8.5	1.8	20.9	2.0	6.7	1.7	25.6	1.9			
	21st	Division	N	9.7		1.5	6.1		3.5	9.9		1.6	8.9	2.0	22.5	2.6	7.8	1.0	12.8	2.0	9.0	1.0	11.1	0.7	9.4	1.5	15.5	1.4	9.0	2.8	30.8	1.4	11.3	3.7	32.7	1.5	8.6	1.8	21.4	1.6			
	Division	21st	S	9.4		1.8	7.6		2.7	10.0		2.5	9.6	2.7	28.2	2.4	9.0	1.8	20.0	1.6	8.2	1.5	18.3	1.0	8.8	0.9	10.3	1.8	8.9	1.6	18.0	1.5	10.2	2.6	25.3	1.6	8.7	1.5	16.9	1.7			
	21st	Cesar Chavez	S	7.4		2.1	5.7		2.8	7.0		2.8	8.6	2.7	31.0	2.1	6.0	1.2	20.0	1.4	6.0	1.2	20.0	0.7	8.0	1.6	20.1	2.2	7.9	2.0	24.6	1.4	8.5	2.1	24.5	1.8	8.2	2.4	28.8	1.5			
Skyline	County Line	Sloat	N										25.9	4.6	17.9	1.6	21.7	3.1	14.3	2.0	16.4	3.0	18.3	2.2	24.9	3.0	11.9	1.4															
	Sloat	County Line	S										20.0	3.8	19.0	1.9									13.8																		

NAME	FROM	TO	DIR	2006				2007				2009				2011				2013				2015				2017				2019				2021				2023			
				AVG. TRANSIT SPEED (MPH)	S.D. TRANSIT SPEED (MPH)	COEFFICIENT OF VARIATION	AUTO-TRANSIT SPEED RATIO	AVG. TRANSIT SPEED (MPH)	S.D. TRANSIT SPEED (MPH)	COEFFICIENT OF VARIATION	AUTO-TRANSIT SPEED RATIO	AVG. TRANSIT SPEED (MPH)	S.D. TRANSIT SPEED (MPH)	COEFFICIENT OF VARIATION	AUTO-TRANSIT SPEED RATIO	AVG. TRANSIT SPEED (MPH)	S.D. TRANSIT SPEED (MPH)	COEFFICIENT OF VARIATION	AUTO-TRANSIT SPEED RATIO	AVG. TRANSIT SPEED (MPH)	S.D. TRANSIT SPEED (MPH)	COEFFICIENT OF VARIATION	AUTO-TRANSIT SPEED RATIO	AVG. TRANSIT SPEED (MPH)	S.D. TRANSIT SPEED (MPH)	COEFFICIENT OF VARIATION	AUTO-TRANSIT SPEED RATIO	AVG. TRANSIT SPEED (MPH)	S.D. TRANSIT SPEED (MPH)	COEFFICIENT OF VARIATION	AUTO-TRANSIT SPEED RATIO	AVG. TRANSIT SPEED (MPH)	S.D. TRANSIT SPEED (MPH)	COEFFICIENT OF VARIATION	AUTO-TRANSIT SPEED RATIO								
Sutter	Divisadero	Gough	E	11.4		1.4		5.2		3.1		8.2		1.9		7.2	1.7	23.2	1.9	8.1	1.0	12.3	1.9	7.9	1.1	13.9	1.5	7.7	0.5	6.7	1.4	7.5	1.0	13.0	1.3			8.2	1.0	12.0	1.4		
	Market	Mason	W	5.7		2.0		5.8		2.3		6.1		1.9		5.4	2.0	37.6	2.3	5.7	1.4	24.6	2.1	5.7	1.0	17.5	1.8	6.3	0.6	9.9	1.3	4.9	0.9	18.7	1.7			5.5	0.9	17.1	1.8		
	Mason	Gough	W	6.5		2.0		8.4		1.5		6.6		2.2		6.1	1.6	26.2	1.9	6.6	0.9	13.6	1.9	6.4	1.4	21.9	1.7	6.9	0.4	6.0	1.6	5.7	0.9	15.8	1.9			5.5	0.7	12.0	2.2		
	Gough	Divisadero	W	9.1		1.5		6.6		2.4		7.9		1.9		6.8	1.3	19.1	2.0	7.6	1.2	15.8	1.7	7.6	0.8	10.5	1.6	7.9	0.7	9.2	1.4	6.8	1.0	15.0	1.8			7.6	0.8	10.1	1.8		
Townsend	7th	2nd	E									10.4		1.1		9.2	2.4	25.6	1.7	7.5	2.0	26.7	2.3	5.1	1.7	33.3	1.6	5.5	1.6	29.8	1.6	6.6	2.4	36.9	1.3								
	2nd	7th	W									10.3		1.3		7.9	2.3	29.2	1.5	5.7	1.2	21.1	2.9	5.7	3.5	61.4	1.6	5.2	1.1	20.8	1.8	8.0	1.3	15.7	1.1								
Turk	Stanyan	Divisadero	E	10.5		1.8		5.4		3.5		11.7		1.5		9.8	3.1	32.0	1.8	10.5	2.3	21.9	1.9	10.1	1.2	11.9	1.8	9.5	1.5	16.0	1.5	8.4	1.8	21.1	1.6			8.4	1.6	18.7	1.7		
	Market	Hyde	W									5.8		1.9		5.5	1.6	29.4	2.1	7.0	1.6	22.9	1.9	6.7	1.6	23.9	1.9	6.0	0.8	12.8	1.5	4.5	1.0	23.0	1.9			3.8	0.6	15.9	2.6		
	Hyde	Gough	W												6.6	2.1	31.5	1.7	8.0	1.5	18.8	1.8									4.6	0.9	19.4	1.9									
	Gough	Divisadero	W																																								
Van Ness/S VanNess	Divisadero	Stanyan	W	10.2		2.1		10.3		1.8		10.4		2.5		9.1	3.2	35.5	1.9	8.0	1.8	22.5	2.4	9.0	1.7	18.9	1.9	8.5	1.2	13.6	1.9	8.2	1.8	21.4	2.2			9.1	1.6	17.2	1.9		
	Cesar Chavez	13th	N																																								
	13th	Golden Gate	N	5.0		2.0		5.1		2.5		6.4		2.3		5.9	1.8	31.1	2.3	5.7	0.9	15.8	2.4	5.7	0.7	12.3	1.7	6.2	0.6	10.0	1.4	6.3	1.4	21.6	1.2	9.2	2.3	24.7	1.6				
	Golden Gate	Washington	N	5.3		3.1		7.2		2.4		6.2		2.8		5.5	1.7	30.7	4.0	5.4	0.4	7.4	2.7	5.2	0.4	7.7	2.3	6.4	0.6	8.8	2.1	6.1	0.9	14.1	2.2	8.1	1.7	20.6	2.0	8.9	1.6	17.7	1.3
	Washington	Lombard	N	7.9		2.8		6.1		4.4		8.5		3.1		7.8	2.1	26.8	3.2	7.6	0.9	11.8	2.3	7.4	0.7	9.5	2.2	6.8	1.0	14.7	2.3	5.6	1.3	22.7	3.0	7.0	1.7	24.6	2.7				
	Lombard	Washington	S	6.4		2.1		5.4		3.7		6.6		1.9		6.6	2.2	32.8	2.6	6.4	0.7	10.9	2.1	6.2	0.4	6.5	2.0	6.6	0.8	12.2	1.7	6.4	1.0	15.7	1.6	6.8	1.4	20.4	1.9	6.6	1.5	22.1	1.5
	Washington	Golden Gate	S	4.1		2.0		7.6		1.4		6.0		2.0		5.6	1.3	23.9	2.1	5.4	0.6	11.1	2.4	5.2	0.6	11.5	1.9	5.2	0.9	17.5	1.5	5.1	0.7	12.9	1.8	6.4	1.2	19.5	1.8	6.8	0.8	12.2	1.3
Golden Gate	13th	S	11.4		0.8		7.7		1.6		6.5		1.9		6.2	1.9	30.0	2.7	6.1	1.0	16.4	2.3	4.7	0.6	12.8	1.7	4.2	0.4	9.2	1.6	4.5	0.9	19.6	1.6	7.1	1.7	24.5	1.6					
13th	Cesar Chavez	S														7.1	1.7	24.2	2.6																								
Washington	Drumm	Kearny	W													6.2	2.0	32.3	2.4																								
West Portal	Sloat	Ulloa	N	6.6		2.3		7.1		2.1					6.1	2.2	36.0	2.5	7.8	3.3	42.3	1.8	11.4	2.4	21.1	1.0	10.9	1.2	11.1	1.1					8.6	2.5	29.0	1.5					
	Ulloa	Sloat	S	8.9		1.9		6.6		2.3					4.1	1.4	35.3	4.1	8.5	1.8	21.2	1.6	5.8	0.8	13.8	2.5	5.7	1.3	22.8	2.3	6.3	1.8	28.8	1.8	6.7	1.9	29.1	2.0					
I-280	Junipero Serra	Weldon	E																																								
	Weldon	6th/Brannan	N																																								
US-101	County Line	Cortland	N																																								
	Cortland	I-80	N																																								
I-80	I-80	Market	N																																								
	Treasure Island	Fremont Exit	W																									17.4	3.5	20.3	1.2												
I-280	Fremont Exit	US-101	W																																								
	6th/Brannan	Weldon	S																																								
US-101	Weldon	Junipero Serra	S																																								
	Market	I-80	S																																								
I-80	I-80	Cortland	S																																								
	Cortland	Monster Park Exit	S																																								
I-80	US-101	Fremont Exit	E																																								
	Fremont Exit	Treasure Island	E																									18.9	2.3	12.3	1.9												

APPENDIX 7

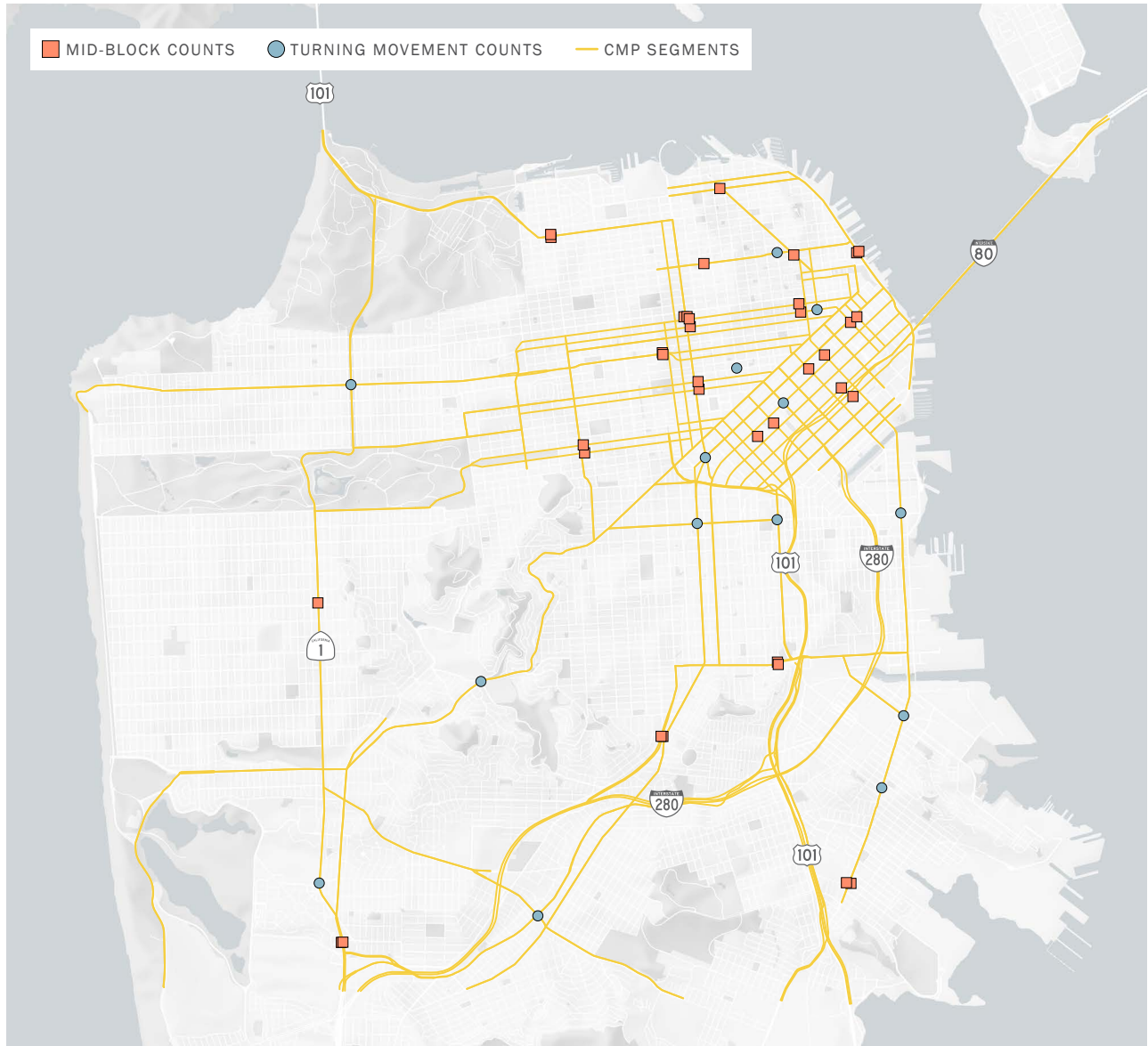
Multimodal Counts Data

KEY TOPICS

- Turning Movement Counts
- Mid-block Counts

In 2023, the Transportation Authority continued to conduct its biennial mid-block and intersection multimodal volume counts. These counts are in addition to the legislatively required CMP performance measures and are therefore not subject to deficiency analyses. Two types of field volume counts were conducted at key locations across San Francisco: turning movement counts and mid-block counts (Figure A7-1). The data collected with these counts are used by agencies for planning and operations activities. Note that construction and other activities at individual sites can affect count numbers.

Figure A7-1. Location of Turning Movement and Mid-Block Counts



A7.1 Turning Movement Counts

Turning Movement Counts for three modes (vehicles, pedestrians, and bicycle) were conducted at 14 intersections during the a.m. and p.m. peak periods on a single day within the monitoring period (Table A7-1).

Table A7-1. Average Weekday Multimodal Volumes at Intersection Count Locations 2023

LOCATION	AM PEAK (7:00 – 9:00 A.M.)			PM PEAK (4:30 – 6:30 P.M.)		
	VEHICLE TRAFFIC	BICYCLES	PEDESTRIANS	VEHICLE TRAFFIC	BICYCLES	PEDESTRIANS
3rd St and 16th St	1934	52	531	2493	79	576
3rd St and Evans Ave	3053	7	202	2926	10	165
3rd St and Palou Ave	2219	24	507	2562	18	807
6th St and Howard St	2475	72	458	4012	336	856
19th Ave and Holloway Ave	7838	21	770	8991	21	1165
Geneva Ave and Alemany Blvd	4630	8	132	5140	18	187
Leavenworth St and Eddy St	1247	37	963	1208	37	1424
Mission St and 16th St	1882	39	2612	2888	87	4462
Montgomery St and Bush St	2693	39	3596	2155	95	4155
Park Presidio Blvd and Geary Blvd	10748	1	542	11891	10	636
Portola Dr and O’Shaughnessy/Woodside	6702	33	423	7595	52	214
Potrero Ave and 16th St	3582	67	478	4628	81	744
South Van Ness Ave and 13th St	7674	11	175	7626	16	277
Stockton St and Broadway	3458	36	1717	4099	54	3287
Total	60135	447	13106	68214	914	18955

A7.2 Mid-block Counts

Mid-block counts were recorded at 29 locations (of which 16 are one-ways and 13 are two-ways) for at least three consecutive weekdays (Tuesday to Thursday) within the monitoring period. For the CMP 2023, three locations (19th Ave between Moraga and Noriega, Mission St between 24th and 25th, and Van Ness Ave between California and Pine) were extended beyond the 3-day monitoring period to record the following Friday, Saturday and Sunday for a total of six days. Results of weekday¹ average mid-block traffic counts from 2015 to 2023 are shown in Table A7-2.²

¹ I.e. the data were averaged over Tuesday to Thursday/Friday only.

² The CMP 2023 corrects and publishes previously unreported mid-block average weekday traffic counts from the CMP 2017 to 2021.

Table A7-2. Average Weekday Traffic Volumes at Mid-block Count Locations, 2015 - 2023

LOCATION	DIRECTION	2015			2017			2019			2021			2023		
		AM PEAK	PM PEAK	DAILY	AM PEAK	PM PEAK	DAILY	AM PEAK	PM PEAK	DAILY	AM PEAK	PM PEAK	DAILY	AM PEAK	PM PEAK	DAILY
19th Ave Between Moraga And Noriega	NB	2,895.8	4,225.0	32,591.3	4,002.8	4,623.3	35,578.3	3,351.2	4,067.6	30,917.6	2,773.3	4,003.5	25,830.5	3,785.0	4,247.5	29,689.0
19th Ave Between Moraga And Noriega	SB	4,251.8	4,840.8	36,196.8	4,117.8	4,752.3	36,214.0	4,148.6	4,649.2	35,162.2	3,140.0	4,372.8	29,136.0	2,496.8	3,226.8	24,018.5
1st St Between Mission And Minna	SB	2,001.0	1,236.3	15,061.0	2,791.7	1,493.0	21,313.0	2,407.7	2,322.3	21,242.7	1,858.0	1,900.0	17,479.7	844.3	2,213.0	19,440.3
3rd St Between Fitzgerald And Gilman	NB	1,754.0	1,270.3	11,169.3	1,833.7	1,473.7	12,500.7	1,363.3	1,157.0	10,483.0	1,114.7	955.7	8,145.7	1,186.7	1,037.7	9,067.7
3rd St Between Fitzgerald And Gilman	SB	1,217.0	1,501.3	9,892.0	1,052.0	1,682.0	10,751.0	1,360.0	854.7	8,097.0	1,063.0	1,217.3	8,601.0	494.3	1,178.7	8,284.3
3rd St Between Minna And Howard	NB	3,660.7	3,274.0	29,231.0	3,369.7	3,187.7	28,696.0	3,428.7	3,116.0	28,570.0	3,028.3	2,443.3	21,430.7	2,954.0	3,151.3	26,397.0
4th St Between Minna And Howard	SB	1,241.7	2,273.7	14,858.7	1,487.0	2,255.7	16,028.3	1,625.3	2,230.3	18,396.7	1,192.3	2,195.0	14,229.3	751.3	2,076.3	15,055.7
7th St Between Howard And Folsom	NB	2,718.7	2,980.0	22,434.3	2,543.3	2,513.0	20,520.3	2,565.0	2,471.3	20,221.0	1,806.3	1,277.3	11,052.7	2,066.7	1,716.3	14,380.3
8th St Between Tehama And Celementina	SB	2,454.3	1,920.3	19,720.7	2,270.3	2,445.7	18,773.7	1,760.0	1,607.0	12,768.3	846.7	1,570.7	9,574.3	1,451.3	1,712.3	11,651.0
Columbus Ave Between Broadway And Pacific	NB	1,410.7	1,676.7	11,797.7	750.3	1,555.0	9,290.3	774.7	1,666.3	9,457.0	627.0	893.3	5,921.7	748.7	1,029.3	7,124.3
Columbus Ave Between Broadway And Pacific	SB	2,018.3	1,326.7	13,102.0	1,442.0	704.0	8,132.3	1,429.3	844.0	8,591.7	952.7	1,021.7	8,398.0	988.7	1,085.7	8,911.7
Fremont St Between Mission And Natoma	NB	2,493.3	2,109.0	19,928.0	2,520.3	2,116.3	20,011.3	2,596.7	2,393.0	19,458.0	2,666.0	2,146.0	18,384.0	1,403.7	2,431.0	21,823.0
Junipero Serra Blvd Between Font And Brotherhood Ramps	NB	5,930.7	6,234.3	50,643.7	5,147.0	5,382.7	44,693.0	4,663.7	4,964.0	38,361.0	4,947.3	5,565.0	38,614.3	5,005.0	5,398.3	41,785.0
Junipero Serra Blvd Between Font And Brotherhood Ramps	SB	6,408.0	6,720.3	49,438.3	5,664.3	5,870.3	46,211.7	6,335.0	6,448.0	48,518.3	4,640.3	6,037.7	39,574.0	5,737.7	6,327.7	45,505.3
Mission St Between 24th And 25th	NB	1,029.3	986.5	7,607.8	359.5	409.3	3,527.3	719.0	981.0	7,161.2	282.0	460.8	3,167.0	421.3	831.0	5,617.5
Mission St Between 24th And 25th	SB	508.0	1,090.3	7,066.8	399.0	757.8	5,220.8	501.0	848.8	6,215.8	469.5	1,099.0	6,802.8	511.8	1,243.0	7,771.5
San Jose Ave Between Randall And Saint Mary'S	NB	3,398.7	2,867.3	20,457.0	3,201.7	2,915.3	20,002.3	2,988.0	2,445.7	18,536.0	2,571.0	2,234.3	15,367.7	2,942.3	2,787.7	17,483.3
San Jose Ave Between Randall And Saint Mary'S	SB	2,354.3	3,247.7	17,792.7	2,683.3	3,566.3	20,001.0	2,217.0	3,525.7	19,520.3	1,485.3	3,065.0	15,429.7	2,001.3	3,151.7	17,034.0
The Embarcadero Between Broadway And Washington	NB	2,575.7	2,202.0	19,132.0	2,739.7	2,697.3	21,111.7	2,518.7	2,514.3	19,287.0	1,450.3	1,326.3	11,122.7	926.7	1,462.0	12,346.7
The Embarcadero Between Broadway And Washington	SB	2,140.0	1,664.0	16,424.0	2,111.3	2,123.3	16,690.7	1,596.7	1,482.3	12,928.3	1,040.3	1,702.7	10,974.7	914.7	2,017.7	14,795.3
Van Ness Ave Between California And Pine	NB	2,975.0	2,807.8	25,609.0	-	-	-	1,770.4	1,960.6	14,953.4	768.0	1,816.3	9,567.5	875.0	1,920.3	10,536.5
Van Ness Ave Between California And Pine	SB	2,061.3	3,087.0	22,205.3	-	-	-	2,469.4	2,043.0	16,468.2	1,628.0	1,490.5	11,334.5	1,736.3	1,594.5	12,368.8
Bay St Between Leavenworth And Columbus	EB	2,562.3	1,324.7	11,571.7	2,381.3	1,321.7	11,872.0	2,500.3	1,350.3	12,424.3	942.0	998.3	6,839.7	2,069.7	1,113.7	8,970.3
Bay St Between Leavenworth And Columbus	WB	947.3	2,357.0	10,806.0	1,121.3	2,690.7	13,054.3	2,237.7	1,641.0	11,776.0	663.0	1,195.7	6,927.0	744.3	1,733.7	8,585.0
Broadway Tunnel Between Larkin And Powell	EB	2,113.7	1,867.0	16,423.3	2,235.7	2,000.0	15,725.3	2,380.3	2,239.7	18,225.0	1,802.0	1,418.0	11,606.0	2,416.7	2,077.0	16,006.3
Broadway Tunnel Between Larkin And Powell	WB	1,295.0	2,412.3	14,345.3	1,167.0	2,181.0	13,182.7	1,167.3	2,099.0	12,733.3	973.0	1,219.7	7,851.0	822.0	1,862.0	9,900.3
Bryant St Between 4th And 3rd	EB	3,227.0	1,680.3	20,518.0	3,328.0	1,923.7	22,227.3	3,410.3	1,765.3	22,195.3	1,786.0	1,367.3	14,708.3	1,876.0	1,463.3	15,574.0
Bush St Between Grant And Kearny	EB	3,693.3	3,244.0	29,037.0	2,343.0	1,770.0	15,757.3	2,471.7	1,607.3	16,196.0	1,352.3	1,351.7	11,503.0	2,030.3	1,615.7	13,903.0
Bush St Between Van Ness And Polk	EB	2,984.7	2,021.0	21,215.0	3,048.3	2,185.3	19,063.7	2,849.0	2,318.0	18,563.3	1,828.0	2,072.3	14,015.0	693.7	1,927.3	16,288.3
Cesar Chavez St Between York And Hampshire	EB	3,287.0	3,782.3	28,494.3	3,538.0	3,275.7	25,209.0	3,194.3	3,106.7	24,363.0	2,444.7	2,955.3	20,300.0	2,979.3	3,105.0	21,084.3
Cesar Chavez St Between York And Hampshire	WB	3,592.0	3,282.3	25,407.3	3,190.7	3,659.0	26,136.3	2,871.0	3,557.7	25,532.7	2,873.3	3,112.3	22,345.0	3,104.0	3,644.7	25,069.3
Fell St Between Divisadero And Scott	WB	2,815.0	4,080.3	28,481.0	3,212.0	4,555.7	32,042.3	3,211.0	4,711.0	31,660.7	2,944.0	3,786.0	26,827.0	1,024.7	2,957.0	26,131.3
Geary Blvd Between Laguna And Gough	EB	3,298.0	2,099.0	18,188.7	2,371.3	1,863.0	15,866.7	2,606.7	1,773.7	15,030.7	1,412.7	1,274.7	10,258.3	1,931.7	1,424.3	12,249.7
Geary Blvd Between Laguna And Gough	WB	1,498.7	2,595.3	16,443.0	1,226.3	2,485.3	13,993.0	1,486.7	2,585.3	15,105.3	1,141.0	1,675.0	10,536.7	1,293.7	2,227.3	12,759.0
Golden Gate Ave Between Van Ness And Polk	EB	1,997.3	1,726.3	13,568.7	1,972.3	1,637.3	13,172.0	1,493.0	1,504.0	10,888.3	685.3	846.0	5,840.7	827.3	1,050.0	5,965.3
Harrison St Between 4th And 3rd	WB	2,489.0	3,177.7	24,093.3	2,753.7	3,275.7	26,424.3	1,625.0	2,181.0	15,291.0	1,293.7	1,790.7	12,948.0	1,445.7	1,861.0	14,131.0
Lombard St Between Broderick And Divisadero	EB	3,919.7	2,938.7	25,346.3	3,890.0	2,253.0	21,848.7	3,767.0	2,453.7	21,362.0	3,262.3	2,082.0	17,101.3	3,846.0	2,930.0	22,578.0
Lombard St Between Broderick And Divisadero	WB	2,214.0	3,819.7	25,452.0	1,926.0	3,073.7	19,532.0	1,882.0	3,184.0	21,952.3	1,499.0	3,428.0	19,351.3	1,797.0	3,193.0	20,062.0
Oak St Between Divisadero And Scott	EB	3,616.3	3,095.3	27,873.3	3,919.7	3,453.3	30,982.0	4,339.7	3,678.7	32,806.0	3,370.7	3,180.3	26,317.0	1,698.7	2,914.0	25,153.3
Pine St Between Grant And Kearny	WB	1,542.0	2,164.0	15,108.7	1,552.3	2,333.3	16,514.0	1,604.3	2,888.7	17,430.0	1,869.3	1,884.0	14,314.7	1,655.3	2,349.3	16,380.0
Pine St Between Van Ness And Polk	WB	1,276.0	2,866.7	18,327.0	1,816.3	3,111.0	21,030.0	1,636.0	3,143.0	18,898.0	1,843.7	2,306.7	15,872.0	1,815.3	2,829.7	18,555.3
Turk St Between Van Ness And Polk	WB	1,230.7	1,825.0	11,917.0	1,173.7	1,787.7	11,348.3	949.3	1,350.7	8,793.7	668.0	700.3	5,395.3	798.3	1,151.7	6,877.3

Notes: NB = northbound, SB = southbound, EB = eastbound, WB = westbound; No data collection at Van Ness Ave Between California And Pine in 2017 due to construction.

APPENDIX 8

Travel Demand Management

KEY TOPICS

- TDM General Plan Objectives
- TDM Requirements
- TDM Policies
- TDM Programs
- TDM Studies and Plans

A8.1 TDM General Plan Objectives

The Transportation Element of the General Plan lays out the City's policy of transit-oriented solutions for accommodating growth in travel demand and discouraging single-occupant automobile travel:

Objective 3: Maintain and enhance San Francisco's position as a regional destination without inducing a greater volume of through automobile traffic.

Objective 4: Maintain and enhance San Francisco's position as the hub of a regional, city-centered transit system.

Objective 7: Develop a parking strategy that encourages short-term parking at the periphery of downtown and long-term intercept parking at the periphery of the urbanized bay area to meet the needs of long-distance commuters traveling by automobile to San Francisco or nearby destinations.

Objective 10: Develop and employ methods of measuring the performance of the city's transportation system that respond to its multi-modal nature.

Objective 11: Establish public transit as the primary mode of transportation in San Francisco and as a means through which to guide future development and improve regional mobility and air quality.

Objective 16: Develop and implement programs that will efficiently manage the supply of parking at employment centers throughout the city so as to discourage single-occupant ridership and encourage ridesharing, transit and other alternatives to the single-occupant automobile.

Objective 17: Develop and implement parking management programs in the downtown that will provide alternatives encouraging the efficient use of the area's limited parking supply and abundant transit services.

Objective 20: Give first priority to improving transit service throughout the city, providing a convenient and efficient system as a preferable alternative to automobile use.

Objective 21: Develop transit as the primary mode of travel to and from downtown and all major activity centers within the region.

Objective 23: Improve the city's pedestrian circulation system to provide for efficient, pleasant, and safe movement.

Objective 27: Ensure that bicycles can be used safely and conveniently as a primary means of transportation, as well as for recreational purposes.

Objective 28: Establish parking rates and off-street parking fare structures to reflect the full costs, monetary and environmental, of parking in the city.

Objective 32: Limit parking in downtown to help ensure that the number of auto trips to and from downtown will not be detrimental to the growth or amenity of downtown.

Objective 34: Relate the amount of parking in residential areas and neighborhood commercial districts to the capacity of the city's street system and land use patterns.

A8.2 TDM Requirements

A8.2.1 REGIONAL TDM REQUIREMENTS – TRANSPORTATION CONTROL MEASURES

San Francisco is subject to regional air district requirements to implement TDM measures (also referred to as Transportation Control Measures) to address air quality issues. In 1991 as required by the California Clean Air Act (CCAA), the Association of Bay Area Governments (ABAG), the Bay Area Air Quality Management District (BAAQMD), and the Metropolitan Transportation Commission (MTC) jointly prepared the first Bay Area Clean Air Plan, which included measures to reduce the total number of trips and miles traveled, ("Transportation Control Measures," or TCMs). The most recent Plan, the 2017 Bay Area Clean Air Plan, was adopted by BAAQMD in April 2017. The Plan addresses greenhouse gases, as well as ozone, particulate matter, and air toxics. It also included new and revised TCMs. The 2017 Clean Air Plan focuses on laying groundwork for a long-term effort to reduce Bay Area GHG emissions 40 percent below 1990 levels by 2030 and 80 percent below 1990 levels by 2050. It also updates the 2010 Clean Air Plan, to fulfill state ozone planning requirements and includes all feasible measures to reduce emissions of ozone precursors – reactive organic gases (ROG) and nitrogen oxides (NOx) – and reduce transport of ozone and its precursors to neighboring air basins. In addition, the Plan builds upon and enhances the Air District's efforts to reduce emissions of fine particulate matter and toxic air contaminants.

Local agencies are expected to incorporate TCMs into planning and implementation for transportation and land use programs. The region, through the MTC, is held responsible for overall progress toward the stated goals. The CMP process provides an opportunity to integrate local planning and programming into the regional air quality

planning process. Appendix 9 lists the currently adopted regional TCMs, and discusses how San Francisco's congestion management strategies contribute to, or reinforce, these measures.

A8.2.2 TDM REQUIREMENTS ON NEW DEVELOPMENT

Area Plans and Development Agreements

Numerous TDM requirements are included within area plans and negotiated agreements for major developments. Significant examples include the following:

- **The Transit Center District Plan** emphasizes Transportation Demand Management as a means of reducing the reliance on automobiles and encouraging mode shifts to transit, carpooling, bicycling, and walking. The plan goals state that 95 percent of trips should be made by transit, walking, or bicycling. It includes supplementary objectives to reach this goal, such as parking supply and management tools; transit incentives, and expansion of Section 163 requirements (see below).
- **The Park Merced Transportation Plan** includes shuttles to Daly City BART and a Shopper's Shuttle to local destinations. In addition, a transportation coordinator will coordinate and manage additional TDM programs.
- **The Candlestick Point & Hunters Point Shipyard Phase II Transportation Plan** proposes new bus service and infrastructure, and requires a Transportation Coordinator to manage unbundled parking, bicycle support facilities, provide transit passes (paid by homeowner's dues), and implement dynamic pricing for visitor parking. The TDM Program will target both residents and employers in the area, with employers expected to provide bicycle parking and amenities, carpooling and vanpooling services, Guaranteed Ride Home program, information on transportation alternatives, commuter checks, telecommuting options, and parking cash-out programs.

- **The Treasure Island Transportation Implementation Plan** includes a congestion pricing program, parking policies, mandatory pre-paid transit vouchers, ramp metering, and special events and emergency access transportation planning. The program will disincentivize residents' use of personal automobiles and increase the appeal of transit, walking, and bicycling. In addition, the parking policies will utilize parking maximums instead of minimums, and unbundle parking prices. Transit passes would also be mandatory for residential units and hotel guests. Additional TDM programs proposed in this plan include Bay Area Bikeshare stations, carshare availability, and employer TDM programs. In 2014, the San Francisco Transportation Authority was designated as the Mobility Management Agency for Treasure Island, and will be responsible for implementation of TDM on Treasure Island.
- **The Southern Bayfront Strategy** is a collection of neighborhoods and communities along San Francisco's eastern waterfront bounded by Mission Creek to the north and Executive Park to the south. Another 20,000 new households and 38,000 new jobs are planned within four major developments that are moving forward in the next several years through negotiated development agreements (DAs) with the city: Mission Rock, Pier 70, Potrero Power Station, and India Basin. The large DA projects present opportunities to go beyond the framework of the city's TDM Ordinance. Each of the DAs within the Southern Bayfront Strategy includes a "trip cap," a program to monitor and restrict the number of SOV trips allowed to be generated by the projects.

Institutional Master Plans

TDM measures are also present in Institutional Master Plans (IMP), which city planning code requires for all medical and post-secondary educational institutions in the City and County of San Francisco; currently 41 institutions are subject to the requirement. IMPs describe any planned campus expansions and present mitigations for reducing the impact of the expansion on the surrounding neighborhood; this could include TDM measures such as shuttles, changes to parking policy, etc. For example, the IMP prepared by the California Pacific Medical Center in 2008 describes the campus TDM program, which includes elements such as free transit passes, vanpool subsidies, and other measures.

Section 163 Requirements and TMA SF

Planning Code Section 163 requires that all new development of over 100,000 square feet of new office space (or 25,000 square feet in some districts), or 100 residential units in specific zoning designations undertake measures to mitigate impacts on the transportation system, for the lifetime of the project. Section 163 was

first added to the Planning Code in 1985 (Ordinance 414-85) as a means to mitigate the transportation impacts, and thus allow a greater density of development than would otherwise be possible. It was subsequently expanded to all new development of over 100,000 square feet in downtown areas zoned C-3, and has more recently been expanded again to include other non-residential, office space outside of the C-3-O, and residential development

Planning Code 163 requires that project sponsors provide onsite transportation brokerage and management service to building occupants that include coordination, encouragement, and promotion of TDM activities, including:

- Transit and ridesharing
- Reduced parking demand and efficient use of parking
- Provision of car-sharing pods and use of car-sharing services (per Section 166)
- Flex-time or staggered work hours program
- Other activities determined by the Planning Department to be appropriate to meeting the purpose of this requirement

Buildings can elect to meet Section 163 requirements on their own or by contracting with a City-approved provider (or vendor) of transportation brokerage services or administering TDM services on their own. Currently, TMA SF Connects, a non-profit organization, is the only City-approved vendor of transportation brokerage services. TMA SF was first incorporated as a non-profit in 1989 and began to provide transportation management services in 1990. TMA SF provides information support and promotions to its currently 68 member building tenants to reduce drive alone rates. Its member buildings report a single-occupancy vehicle (SOV) mode share of less than 10 percent in the last several years. TMA SF's activities include providing a web site with transportation resources for employers and travelers, publishing a newsletter, issuing traveler alerts, and organizing periodic campaigns to promote sustainable commute alternatives.

Mission Bay Transportation Management Association

As a condition of the Mission Bay Development Plan, the Mission Bay Transportation Management Association (TMA) was formed and began operating in May 2010. The TMA operates shuttle service to and from BART and Caltrain, facilitates TDM marketing, provides bicycle parking assistance, and provides information via a website. Membership includes all property owners and developers, including the recent addition of the Golden State Warriors with the completion of Chase Arena in Fall 2019. According to the 2017 Mission Bay Annual Report, annual shuttle ridership has experienced declines since peaking at over 375,000 in 2014 to under 325,000 in 2017. Mission Bay TMA shuttles serve multiple areas of the City, not just Mission Bay, and the

service area has changed over time as the district has been built out and partnerships with other areas have been established and ended.

Planning Code Requirements

The San Francisco Planning Code contains numerous additional requirements to help ensure new developments include features to support sustainable transportation.

For example:

- Unbundled parking is required for residential buildings with ten or more dwelling units.
- Carshare parking is required for residential and nonresidential development.
- Secure bicycle parking is required across most types of development.
- Showers and lockers are required for most commercial uses and for large retail uses.

A8.3 TDM Policies

A8.3.1 COMMUTER BENEFITS ORDINANCE

In August 2008, the City enacted a landmark Commuter Benefits Ordinance (CBO), which became effective on January 19, 2009. The ordinance requires businesses with locations in San Francisco and more than 20 employees to offer commuter benefits such as transit, vanpool, and bicycle programs to their eligible employees. In 2012, the Bay Area Air Quality Management District (BAAQMD) and the Bay Area Metropolitan Transportation Commission implemented a similar program on a pilot basis, but focused on employers with fifty or more full-time employees in the region (the local ordinance applies to employers in San Francisco with at least twenty employees nationwide).

The San Francisco Department of the Environment (SFE) is working with the region to coordinate both the local and regional ordinances for seamless implementation and program management. SFE works with employers with fewer than 50 employees and coordinates with the region when outreaching to employers with 50 or more employees. To date, 2520 employers subject to the SF Commuter Benefits Ordinance have submitted a compliance form, with a cumulative 25,000 employees participating in their employer's commuter benefit program.

A8.3.2 SFMTA COMMUTER SHUTTLE POLICY

Numerous employers, educational institutions, medical facilities, office buildings, and transportation management associations offer shuttle service to their employees, students, and clients. Some buildings are required to provide shuttle service as part of their conditions of approval, and an employer may comply with San Francisco's

Commuter Benefits Ordinance by offering a free commute shuttle to employees. The majority of the commuter shuttles are closed systems that provide service to a specific population and are not open to the general public. Most shuttles are provided for free to employees (or students, tenants, etc.).

In 2014, SFMTA launched the Commuter Shuttles Pilot Program to create clear and enforceable locations and guidelines for private shuttle loading and unloading and reduce conflicts with Muni and other vehicles. In October, 2015, SFMTA released a Commuter Shuttle Policy that permits ongoing use of the shared stops subject to additional requirements. In February 2017, SFMTA approved the continuation of the Commuter Shuttle Program, based in part on a mid-year evaluation and commuter shuttles hub study. The hub study, conducted jointly by SFMTA and the Transportation Authority, found that a “hub” model, which would concentrate commuter shuttle stops at a small number of designated locations in the city, would dramatically reduce shuttle ridership, increase driving by current shuttle riders, and increase the risk for crashes in the city. The mid-year evaluation found that the existing program had led to a lower potential for conflicts with Muni, fewer shuttles on small, residential streets, a cleaner vehicle fleet, a reduced potential for service disruptions, including those arising from labor disputes, and increased enforcement for violations of parking laws. The updated program allows the SFMTA to establish shuttle vehicle accessibility guidelines and to issue higher penalties for repeated violations of the shuttle permit terms and conditions.

A8.3.3 SFMTA CARSHARING POLICY

Carsharing programs are encouraged in San Francisco as a means to reduce car ownership and decrease VMT¹. The precise number of carsharing members in San Francisco is unknown but is likely increasing, as new car sharing vendors like GIG Car Share expand the market.

To further encourage carsharing, SFMTA developed a carsharing policy in 2013. The policy outlines the On-Street Car Sharing Pilot Program whereby private carsharing companies can apply to use on-street parking spaces for carshare vehicles. As of December 2019, 237 on-street parking spaces were reserved for carshare vehicles. A 2017 evaluation of the pilot program found that car share cars enrolled in the program were in use 6 hours a day, relative to 1 hour a day for a private vehicle, and were used on-average by 19 unique users per month.

A8.3.4 PARKING MANAGEMENT

The General Plan, Planning Code, and Zoning Code guide parking management in San Francisco. San Francisco’s existing parking policies are intended to support

¹ Cervero, R., Golub, A., & Nee, B. (2007). City CarShare: Longer-term travel demand and car ownership impacts. *Transportation Research Record: Journal of the Transportation Research Board*, 1992, 70-80.

the city's development, and have been especially successful in the downtown area by limiting the provision of parking provided with new office development. Parking policies are also designed to support the City's Transit First policy through a combination of regulatory controls, revenue transfers, regulations, and incentives. In November 2007, San Francisco voters approved Proposition A, which shifted responsibility for parking regulations, fees, and fines from the Board of Supervisors to SFMTA. In 2007, the Transportation Authority and the Metropolitan Transportation Commission (MTC) applied for and subsequently received a U.S. Department of Transportation (USDOT) Urban Partnership Program (UPP) grant, which includes \$19.4 million for a demonstration of variable parking pricing as part of the Federal initiative to fight congestion. SFMTA's SFpark program was a demonstration project funded through the Department of Transportation's Urban Partnership Program where the SFMTA used several strategies to make it easier to find a space and improve the parking experience, including:

- Demand-responsive pricing.
- Making it easier to pay at meters and avoid citations.
- Longer time limits.
- Improved user interface and product design.
- Improved information for drivers, including static directional signs to garages and real-time information about where parking is available on- and off-street.
- Highly transparent, rules-based, and data-driven approach to making changes to parking prices.

SFpark piloted and cultivated several emerging technologies, including smart meters, parking sensors, and a sophisticated data management tool. The demonstration ran from 2010-2014, after which SFMTA evaluated the program. The evaluation found several benefits including better parking availability, improved ease of payment, and reduced circling for parking and associated reductions in greenhouse gas emissions and vehicle miles traveled, among other benefits. After the end of the pilot demonstration, the SFMTA Board established an ongoing demand-responsive parking policy, with meter rate adjustments made approximately once a quarter. Using meter payment data to estimate parking occupancy, the SFMTA raises the rate by \$0.25 on blocks where average occupancy is above 80%, lowers the rate \$0.25 on blocks where average occupancy is below 60%, and does not change the rate on blocks that hit the target occupancy between 60% and 80%.

A8.4 TDM Programs

A8.4.1 EMERGENCY RIDE HOME PROGRAM

The San Francisco Department of Environment (SFE)'s Emergency Ride Home (ERH) program promotes sustainable commuting by ensuring a free or low-cost ride home in cases of emergency. The program pays for a ride home for employees of registered businesses in the event of illness, severe crisis, unscheduled overtime, or disruption of carpool or vanpool schedules. The program is designed to remove some of the risks and reliability concerns associated with the choice of carpooling or relying on transit service for the commute trip. SFE promotes the ERH program to City employees and all San Francisco employers and commuters.

A8.4.2 CARPOOLS

SFMTA encourages the use of carpools and vanpools during the morning and evening commutes. The City provides a casual carpool pick-up location on Beale Street between Howard and Folsom, adjacent to the Temporary Transbay Terminal site. At this location, there is signage indicating several East Bay destination locations.

SFMTA also administers a program through which major employers (those with Transportation Brokerage Services described above) may provide parking for employee carpool vehicles (three or more riders) in City-owned garages at a reduced rate. The City also provides a limited amount of designated on-street parking in the downtown area for registered/permitted vanpool vehicles.

A8.4.3 BIKE SHARING

Bay Wheels, formerly known as Ford GoBike and Bay Area Bike Share, opened on August 29, 2013 with 700 bikes at 70 stations in San Francisco and along the peninsula as a pilot program of the Bay Area Air Quality Management District and the Metropolitan Transportation Commission (MTC). Originally operated by Alta Bikeshare, MTC transferred operations to Motivate in May of 2015, and in 2017 Motivate expanded the program to 5 Bay Area Cities with 540 stations and 7,000 bicycles, including a substantial expansion within San Francisco. Currently, there are over 300 stations in San Francisco. The bike share system is integrated with the clipper card program, allowing both individual trips and memberships to be accessed via the clipper card. In 2018, Lyft purchased Motivate and assumed operations of Ford GoBike, changing the name to Bay Wheels in 2019.

During 2018 and 2019, San Francisco also conducted a pilot permit for JUMP (owned by Uber) to provide dockless electric assist bikes (e-bikes) on City streets. In 2019, SFMTA expanded this to other operators. Currently, dockless e-bikes make up half of the Bay Wheels fleet. In 2023, the MTC and Lyft reached an agreement on a \$16 million expansion of the Bay Wheels system. The expansion includes over 1,000 next-generation docked-only e-bikes and 19 new stations in San Francisco. Several stations will support in-dock charging to reduce operational vehicle miles travelled due to less

battery swapping. The expansion also includes membership price reductions and a discounted student membership pilot.

A8.4.4 E-BIKE DELIVERY PILOT

The City of San Francisco's Department of the Environment is conducting a pilot program that involves providing 35 free electric bikes to delivery drivers. The pilot is designed to reduce carbon emissions and determine the viability of e-bikes for delivery services. Data will be collected from the e-bikes and compared to a control group of delivery drivers using cars, helping the program operators to evaluate the validity of the delivery e-bikes. The one-year pilot program will provide food delivery workers with e-bikes to use for making deliveries. The program will monitor the impact e-bikes have on delivery efficiency and worker revenue while assessing bike safety.

A8.5 TDM Studies and Plans

A8.5.1 TRAVEL DEMAND MANAGEMENT ORDINANCE

The SFMTA, Planning Department, and SFCTA partnered to craft the Travel Demand Management (TDM) Ordinance as part of the Transportation Sustainability Program (TSP). The TDM Ordinance introduced TDM requirements on new construction or changes of land use in San Francisco, and provides a toolkit to aid developers in designing an appropriate TDM program. The toolkit will be used to ensure a consistent approach to including TDM in new development and ensuring that the most effective measures are prioritized. The inter-agency team is committed to analyzing the effectiveness of TDM measures, through research, to improve the toolkit by prioritizing the most effective measures. The San Francisco Board of Supervisors approved the ordinance on February 7, 2017.

The SF Moves Pilot was conducted through collecting data on Mission residents' travel habits using daily text-message polls asking participants to report the number of sustainable trips and car trips they took each day during the Challenge. The more sustainable trips a participant reported and the more text polls they responded to, the greater their chances of winning a prize.

The target geographic area of the Challenge was San Francisco's Mission neighborhood – specifically the 4-block radius around the 20th and Shotwell Slow Streets, the latter of which was made permanent in August 2021. SFE chose this area for the pilot due to its ample access to low-carbon transportation options, and high concentration of BIPOC residents.

The target audience of the Challenge was Mission residents with a particular focus on Spanish-speaking and low-income residents. The Challenge was run in both English

and Spanish, and garnered significant participation in both languages with 75% English language participation and 25% Spanish language participation.

A8.5.2 SAN FRANCISCO TRANSPORTATION PLAN

The San Francisco Transportation Plan 2050 identifies TDM as a systematic approach to shift how, when, and where people travel through programs and policies and an effective tool to address the rise in congestion associated with population and job growth. The SFTP recommends that San Francisco establish a vision and measurable goals for the future TDM strategy to guide development, implementation, and monitoring; identify priority geographic areas, trip types, travel markets, traveler types, and success metrics to guide program selection and implementation details; and provide guidance for how to incorporate ongoing evaluation to track impacts on modeshift and cost effectiveness and guide future TDM investments. This recommendation is reflected in the upcoming TDM Market Analysis and an update to the 2017 TDM Plan.

A8.5.3 SF BUSINESS RELOCATION TDM PROJECT

This is an effort led by SFMTA to develop and operate a program focused on addressing the transportation needs of employees at businesses that are opening in or relocating to new locations in San Francisco. The program was originally scoped to provide transportation planning services and materials to businesses to help their employees travel to work in their new location without driving alone, thus setting a more sustainable commute habit from the get-go, rather than trying to change habits after they have already been set.

The intention of targeting businesses with a TDM intervention as they relocate was to capitalize on a window of opportunity when large numbers of commuters are selecting a new route to work and have not yet formed mode habits that are difficult to influence. The emergence of COVID and resulting health orders changed the business and commute environment such that identifying and targeting businesses as they moved into San Francisco or moved office locations within San Francisco has become infeasible.

However, public health orders requiring office-based businesses to have their employees work-from-home to the greatest extent possible has created a new form of “relocation” – first from the office to remote work locations, followed by a substantial shift of employees returning to their offices when restrictions are eased. After months of working remotely, each returning employee will be selecting a new route and mode(s) to their office, shaped by new motivations and constraints, opening a similar opportunity to influence mode choice as exists when a business relocates their office.

For these reasons SFMTA amended the project scope to shift the target population from businesses as they relocate between offices, to all office-based businesses as changing public health orders allow an increasing number of employees to return to office settings. Given the changes in return to office trends and the city's recovery, this project was paused and will be rescoped to reflect learnings from Phase 2.

APPENDIX 9

San Francisco Trip Reduction Efforts: Relationship to Regional Transportation Control Measures

REGIONAL TCM	LOCAL IMPLEMENTATION
<p>A-1. Local and Area-wide Bus Service Improvements</p>	<p>The San Francisco Municipal Transportation Agency (SFMTA) is currently implementing MuniForward, a major program to upgrade Muni service throughout the city. It includes service and route changes, capital upgrades, and other enhancements to nearly every major bus and rail transit route in the city. Upgrades are designed to make Muni faster and more reliable, and to improve safety.</p> <p>The city also has several major transit improvement projects underway. The Van Ness Bus Rapid Transit Project is currently under construction. The Geary Bus Rapid Transit Project has a Locally Preferred Alternative (LPA) that secured state and federal environmental clearance by 2018. SFMTA is also in the process of replacing its fleet with a goal towards zero emissions.</p>
TCM	LOCAL IMPLEMENTATION
<p>A-2. Improve Local & Regional Rail Service</p>	<p>The Muni Forward project mentioned above includes numerous upgrades to Muni rail service. Five of the seven Muni rail line have capital projects underway (either in the study or implementation phase) to improve service quality and reliability.</p> <p>The Transportation Authority continues to advocate and program funds for local and regional rail improvement projects, such as Phase 2 of the Third Street Light Rail Project (Central Subway), Caltrain electrification and signal improvements, BART station improvements, and the downtown extension of Caltrain and High Speed Rail to the rebuilt Transbay Terminal. Construction on Central Subway began in 2011 and the Transbay Terminal opened in 2019. The Transportation Authority completed the feasibility study for a major upgrade to the M Ocean View line that would underground portions of the line and extend it to Park Merced. The Transportation Authority and SFMTA recently completed a Subway Vision that creates a framework for subway expansion throughout the city and identifies likely corridors. The corridors from the Subway Vision are currently being evaluated as part of the ConnectSF Transit Corridor Study. The Transportation Authority partnered with the Metropolitan Transportation Commission and numerous other agencies to complete a Core Capacity Transit Study that recommended a suite of projects to address transit crowding and unreliability in corridors into downtown San Francisco. The Transportation Authority will be partnering with BART and Capitol Corridor to further evaluate new proposed BART and conventional rail alignments across the Bay.</p>
<p>B-1. Freeway & Arterial Operations Strategies</p>	<p>Implementation of this TCM is being coordinated by Caltrans and the Metropolitan Transportation Commission (MTC). SFMTA's SFgo program is developing an integrated traffic management system managed from a centralized transportation control center. In addition, the Program is working with Caltrans to coordinate freeway improvements with the City's traffic management systems. As part of this project, SFMTA is working to replace aging signal controllers and install signals with transit priority capabilities on key transit routes.</p>
<p>B-2. Transit Efficiency & Use</p>	<p>Major transit operators in San Francisco, including Muni, BART, AC Transit, Golden Gate Transit, Caltrain, and SamTrans, all accept the Clipper card for fare payment. In addition, BART is upgrading signage at its downtown stations to ease wayfinding. Muni is upgrading signage, lighting, and other architectural aspects of its downtown stations. San Francisco has also worked to have discounted or free transit passes be part of TDM and mitigation programs required of new developers such as Candlestick Point/Hunters Point Shipyard, Treasure Island, California Pacific Medical Center, and Park Merced. San Francisco State University has implemented a discount transit pass for trips on BART and Muni.</p>
<p>B-3. Bay Area Express Lane Network</p>	<p>Implementation of this TCM is being led by MTC. An HOV pricing structure exists on the approaches to San Francisco via the San Francisco Oakland Bay Bridge and the Golden Gate Bridge during peak commute hours, with separate HOV lanes on the Bay Bridge. Express buses will continue to operate in San Francisco and will be prioritized through the new Transbay Terminal. The Transportation Authority completed the Freeway Corridor Management Study and is initiating a Caltrans Project Initiation Document (PID) and environmental clearance process for potential express lanes alternatives that may include high occupancy vehicle or high occupancy toll lanes on portions of U.S. 101 and I-280. These lanes would connect to high occupancy toll lanes being implemented on U.S. 101 in San Mateo County.</p>

TCM	LOCAL IMPLEMENTATION
B-4. Goods movement Improvements & Emission Reduction Strategies	Implementation of this TCM is being led by MTC and BAAQMD. San Francisco will work with BAAQMD to implement grant programs that fund diesel emission reduction programs. As part of ConnectSF, the Transportation Authority is evaluating changes in the delivery of goods in San Francisco and opportunities to increase the efficiency and sustainability of freight movement in the City.
C-1. Voluntary Employer-Based Trip Reduction Program.	<p>The San Francisco Department of the Environment (SFE) currently conducts many of the City’s employer based Transportation Demand Management (TDM) activities, funded in part through Prop K. These activities currently include the commuter benefits program; Emergency Ride Home (ERH) program; bicycle fleet (e.g. CityCycle) program; and regional ridesharing program. The San Francisco Planning Department also conducts compliance monitoring of office buildings required to have a TDM program.</p> <p>In 2017, city agencies developed a joint San Francisco TDM Plan: 2017-2020. This workplan, based on the 2014 strategy, identifies the employer-oriented policies, projects, and programs the city can implement to accomplish its TDM goals.</p>
C-2. Safe Routes to School & Safe Routes to Transit Programs	The SFMTA manages San Francisco’s Safe Routes to Schools program, which conducts education, encouragement, and related programs at elementary, middle and high schools in San Francisco. These programs are designed to encourage schoolchildren to walk and bicycle to school rather than driving in the family car.
C-3. Ridesharing Services & Incentives	SFE is the MTC-delegated agency that oversees the Regional Rideshare Program in the City, including introducing employers to TDM programs, promoting rideshare, and encouraging and assisting employers to implement rideshare. SFMTA promotes the use of carpools and vanpools during the morning and evening commutes. The City provides a casual carpool pick-up location for evening commutes on Spear Street between Howard and Folsom Streets. SFMTA also administers a program through which major employers may provide parking for employee carpool vehicles (3 or more riders) in City-owned garages at a reduced rate. The City also provides a limited amount of designated on-street parking in the downtown area for registered vanpool vehicles. Finally, buildings subject to Section 163 Planning Code Requirements are required to encourage alternatives to driving alone, including through ridesharing and carpooling.
C-4. Conduct Public Outreach & Education	Implementation of this TCM (e.g., Spare the Air Days) is occurring through the Air District, MTC, and transit operators throughout the region, as well as through local agency activities, including the ongoing SF Moves pilot project to provide outreach and education to neighborhoods in San Francisco, and the completed TDM Partnership Project which involved employer outreach and education. Additionally, buildings subject to the Section 163 Planning Code requirement must engage in outreach and education activities, such as those provided by the downtown TMA.
C-5. Smart Driving	Implementation of this TCM is being led by MTC. San Francisco does have a traffic calming program, funded through Prop K and implemented by SFMTA, which includes speed reduction on arterials streets. However, speeding on freeways in San Francisco is generally not a major concern due to relatively dense traffic conditions within the city limits.
D-1. Bicycle Access and Facilities Improvements	<p>Since the Bicycle Plan injunction was lifted in 2010, the City and County have moved rapidly to implementation. The SFMTA has installed more than 50 miles of bicycle lanes since 2008, using Prop K as well as regional funding for many projects. Progress on the Plan has also included separated and buffered bike lanes, bike boxes at intersections, colored pavement treatments to increase the visibility and safety of bicycling on City streets, sharrows, and bike racks and bicycle corrals.</p> <p>Several major bicycling improvement projects have been recently completed or will be under construction soon, including implementation of new protected bicycle lanes on Masonic Street, 2nd Street, 7th/8th Street, Division/13th Street, 17th Street, Folsom/Howard Street, San Jose Avenue, upper Market Street, and others.</p>

TCM	LOCAL IMPLEMENTATION
<p>D-2. Pedestrian Access and Facilities Improvements</p>	<p>The General Plan and Planning Code have supported pedestrian friendly, transit-oriented development for decades, which is referred to as the City’s Transit First Policy. The Transportation Authority funds pedestrian-related projects through Prop K and programs other fund sources to support pedestrian improvements. Many of these projects fall under SFMTA’s programs related to traffic calming, pedestrian and bicycle safety, and school area safety, and are also implemented through new development compliance with the Better Streets Plan which sets standards for street improvements associated with new development. Multi-agency efforts to coordinate major construction opportunities with pedestrian projects have also improved through the Follow-the-Paving process.</p> <p>In 2014, following a directive from the Transportation Authority Board, city agencies launched the Vision Zero program aimed to eliminate traffic injuries and fatalities by 2024. Because pedestrians typically make up more than half of fatalities in the city, work has involved focusing on improving conditions for pedestrians, especially on corridors identified as high injury pedestrian corridors.</p>
<p>D-3. Local Land Use Strategies</p>	<p>The Transportation Authority promotes legislative activities that encourage smart growth and more sustainable transportation and development-related investment decisions by the City and developers. ABAG and MTC have been working for years to encourage the region’s municipalities to plan for compact, transit-oriented development to meet the region’s sustainability goals. The most recent regional transportation plan (Plan Bay Area), called for focused growth around Priority Development Areas (PDAs), which largely center around existing or planned transit hubs. The Transportation Authority continues to work closely with City agencies to plan multimodal transportation improvements to support focused growth in San Francisco’s 12 PDAs.</p>
<p>E-1. Value Pricing Strategies</p>	<p>The Transportation Authority has been designated as the Treasure Island Mobility Management Agency (TIMMA). TIMMA is working to implement congestion pricing on Treasure Island, as required in the development agreement prepared for the island.</p> <p>Additionally, the Transportation Authority continues to study the potential for congestion pricing or alternative approaches to manage congestion in downtown San Francisco. In 2018, the Transportation Authority began a fresh look at the idea of congestion pricing with updated data and analysis and a full community engagement process.</p>
<p>E-2. Parking Policies to Reduce VMT</p>	<p>In September 2009, the Transportation Authority adopted the San Francisco On-Street Parking Management and Pricing Study. SFMTA piloted the study’s key recommendations through the SFpark program and adopted demand responsive parking pricing for all City-owned garages and street parking in late 2017. The City has also addressed private off-street parking by eliminating minimum parking requirements downtown and in specific neighborhoods and commercial corridors, in some cases replacing them with maximum parking requirements. Unbundled parking, bicycle parking, and carshare parking requirements have also been implemented. In 2016, the Transportation Authority completed a Parking Supply and Utilization Study that considered further parking policy reform to manage auto trip demand. Rather than pursue any of the strategies analyzed, the study recommended that agencies advance existing parking-related initiatives, including the Residential Parking Permit Evaluation and Reform Project and implementation of the city’s proposed TDM Ordinance.</p>
<p>E-3. Transportation Pricing Reform</p>	<p>The Transportation Authority continues to work with MTC and the Bay Area Partnership to identify new revenue sources. The Authority developed major transportation pricing studies, including the Mobility, Access, and Pricing Study and the Parking Supply and Utilization Study, to examine the potential for pricing to be used in combination with new technology and transportation enhancements to improve system performance and reduce emissions.</p>

APPENDIX 10

Land Use Impacts Analysis Program

KEY TOPICS

- City Land Use Development Process
- CMA-Regional Land Use Coordination
- Neighborhood Transportation Plans and Projects
- Transportation Impact Analysis Studies

A10.1 City Land Use Development Process

The General Plan and the City Charter are the primary policies that guide the City's review of land development impacts on the transportation network. San Francisco is a Charter City, and it has a consolidated city and county government. An eleven-member Board of Supervisors serves as the legislative body for the City's unified city and county government. The City Planning Commission (CPC) has responsibility for land use decision-making throughout the City. The Mayor appoints the seven members of the CPC. Among the responsibilities of the CPC are the following:

- Exclusive authority to act on General Plan policies and area land use plans (per City Charter);
- Holding public hearings on all appeals to Negative Declaration determinations and certification of local Environmental Impact Reports; and
- Discretionary actions on Conditional Use permits, (which can be appealed to the Board of Supervisors) and decisions by the Zoning Administrator, Discretionary Reviews, and others that can be appealed to the Board of Appeals.

In addition, both the CPC and the Board of Supervisors must approve all rezoning.

The Planning Department's land use responsibilities include transportation matters. The Planning Department has primary responsibility for assessment of the transportation impacts of development proposals, and to determine consistency with land use and transportation policies in the General Plan. The existing local regulations include measures to mitigate project-specific transportation impacts within the policy and priority framework of the General Plan, the long-range transportation plan, and the Capital Improvement Program (CIP) of the CMP.

The City already has in place an extensive process for evaluating the transportation impacts of land development proposals. This process, which ensures the City's compliance with State and Federal environmental review requirements, is the responsibility of the Planning Department. With the passage of California Senate Bill 743 (see Section A10.4), the City aligned its CEQA review and development approval process with RTP goals such as a vehicle miles traveled (VMT) reduction target. Nevertheless, as CMA, the Transportation Authority has a role in ensuring that the impacts of land use decisions on the transportation system are analyzed with a uniform methodology, consistent with the long-term strategic goals of the General Plan and the San Francisco Transportation Plan.

A10.1.1 CONSISTENCY WITH LONG TERM STRATEGIC GOALS OF GENERAL PLAN AND SAN FRANCISCO TRANSPORTATION PLAN

San Francisco has been able to maintain one of the highest levels of transit use among U.S. cities because of its relatively high-density development and because topography and geography limit vehicular access routes to and from the City.

There have been significant numbers of non-resident commuters into the city for over a century. To improve the balance of housing and jobs, during the 1980s San Francisco actively promoted new residential development. Extensive revisions to the City's General Plan and rezonings were undertaken. Each of these land use plans – the Downtown Plan, Rincon Hill, North of Market, Chinatown, Neighborhood Commercial, Van Ness Avenue, South of Market, and Mission Bay – incorporated measures to retain and enhance opportunities for residential development.

In recent years, several more area plans have been developed or adopted including: the Market/Octavia Plan, Eastern Neighborhoods Plan, Balboa and Glen Park BART Station Area Plans, the Treasure Island Plan, the Transbay Center District Plan, and the Central SoMa Plan. In addition, housing development has been promoted by the policies of the San Francisco Redevelopment Agency and its successor agency, the Office of Community Investment and Infrastructure, in various areas, including the Rincon Point/South Beach, Yerba Buena Gardens, Transbay, the Bayview Hunters Point Redevelopment Plan Areas, Candlestick Point-Hunters Point Shipyard Phase 2, Parkmerced, and Visitacion Valley.

San Francisco's continued role as a regional employment center and its policy of housing development have had an impact on the demand for transportation in the city. A primary mission of the Transportation Authority is to strategize investment in the city's transportation infrastructure and promote the development of demand management tools to address growing travel demand. Infrastructure investment is intended both to address future growth in transportation demand and to improve the city's current transportation system. Demand management is needed to promote a balanced and cost-effective transportation system.

In past decades, San Francisco's primary transportation challenge was to absorb new jobs downtown without proportionately increasing the number of workers commuting by car. That challenge was addressed with the construction of BART and Muni services focused on downtown commuting, combined with limits on parking provision.

Today San Francisco's transportation challenges are more varied. They are numerous and located across the city, throughout the various neighborhoods as well in core areas, which can expect not only employment growth but also extensive residential growth. Challenges include competitive transit service for non-commute and reverse commute trips; neighborhood parking management; safety for pedestrians and

bicyclists; improved transit reliability and speed through the development of a transit priority network; and reducing emissions of pollution and greenhouse gases. Recent innovations in transportation are rapidly changing how people navigate our city streets. These emerging mobility services and technologies include ride-hailing services (such as Uber & Lyft), microtransit (Via), app-based ridesharing, bike/e-bike/scooter/car-sharing, courier network services, autonomous vehicle technologies, and more. Additionally, post-pandemic continued remote work for some types of occupations presents further challenges.

Regional efforts to coordinate land use and transportation include Priority Development Areas (PDAs) and development of a regional High Occupancy/Toll (HOT) lane system. In addition, state laws promulgated in 2006 and 2007 require greater integration of land use and transportation planning processes in recognition of the climate change challenge.

Underlying these needs is the challenge of finding new mechanisms to pay for needed transit and other improvements as development decisions are made. A discussion of the city's initiative to update transportation impact and mitigation fees is provided in Section A10.4.

NOTE: California Government Code Section 65089(b)(4) requires the land use program to assess the impacts of land development on regional transportation systems. In the 1991 San Francisco CMP this was interpreted to mean impacts on the CMP roadway network. However, the federal Intermodal Surface Transportation Efficiency Act (ISTEA), passed in 1991, explicitly requires the development of a metropolitan transportation system (MTS), including both transit and highways. As discussed in Chapter 3, MTC contracted with the Transportation Authority, acting as CMA, to help develop the MTS and to use the CMP process to link land development decisions to impacts on the MTS. For purposes of the land use analysis program, the San Francisco CMP will use the San Francisco component of the MTS, but conformance with roadway level of service (LOS) standards will continue to be assessed using the CMP roadway network, which is a subset of the multimodal MTS.

A10.2 CMA-Regional Land Use Coordination

A10.2.1 CMP LAND USE IMPACTS ANALYSIS

One key aspect of the CMP approach to land use impacts analysis is that, pursuant to state law, the Transportation Authority will also be responsible for reviewing transportation analysis of specific development projects under CEQA and determining the consistency of these "sub-area" analyses with the citywide model. Examples of this role include our work to support the Bayview/Hunters Point Redevelopment Area

Environmental Impact Report (EIR), the Transbay Center District Plan EIR, and the Market/Octavia Better Neighborhoods Plan EIR, and the Central SoMa Plan and EIR.

A10.2.2 MTC/CMA TRANSPORTATION/LAND USE WORK PLANS

Pursuant to MTC's agreements with county CMAs over coordination of transportation and land use, the Transportation Authority focuses on the following activities to help integrate transportation and land use decisions:

- The Transportation Authority prioritizes transportation planning funds and capital investments that meet performance criteria or demonstrate a strong vision for coordinated land use and transportation development.
- The Transportation Authority provides technical guidance and assistance with the planning process to partner agencies, communities, and project sponsors, including neighborhood planning, thereby facilitating access to discretionary state and regional grants and providing for coordinated county-level input into the regional transportation planning process.
- The Transportation Authority promotes legislative activities that encourage smart growth, more sustainable transportation and development-related investment decisions by the City and developers, and more efficient travel decisions by all transportation system users. Examples include the Transportation Authority's support of the State Resources Agency's revisions to the CEQA Guidelines Transportation Checklist and our work with local partner agencies to reform the City's CEQA transportation impact analysis process.
- The Transportation Authority coordinates county-level input into the regional Sustainable Communities Strategy (SCS), the RTP, and related regional land use planning efforts.
- The Transportation Authority conducts project and program delivery oversight to ensure efficient use of funds and effective project delivery.

A10.2.3 PLAN BAY AREA AND PRIORITY DEVELOPMENT AREAS

ABAG and MTC have been working for years to encourage the region's municipalities to plan for compact, transit-oriented development to meet the region's sustainability goals. This work was previously conducted through the FOCUS program that invited municipalities to nominate locations to be considered as Priority Development Areas (PDAs) or Priority Conservation Areas (PCAs) based on regionally established criteria. In 2013, the region adopted Plan Bay Area, the first SCS for the San Francisco Bay Area prepared pursuant to Senate Bill 375 (Steinberg). PDAs and PCAs are key "building

blocks” of the region’s land use strategy presented in Plan Bay Area. ABAG and MTC approved an update to Plan Bay Area 2050 in October 2021.

Prior to 2019, San Francisco had identified twelve PDAs, generally in the eastern part of San Francisco, and generally locations that have been comprehensively planned as part of an Area Plan process. San Francisco’s PDAs were first identified and approved by the San Francisco Board of Supervisors in 2007 and have been updated since then to reflect slight changes to boundaries. In August 2015, ABAG approved three additional regional PCAs that cross San Francisco: California Coast Trail (along the Pacific coast), San Francisco Bay Water Trail (including access points in San Francisco’s Marina District), and San Francisco Bay Trail (along the Embarcadero, through the Marina and over the Golden Gate Bridge). Five Priority Conservation Areas (PCAs) have been adopted by San Francisco since 2015: Palou Phelps Natural Area, Bayview Hill Natural Area, Green Connections-McLaren Park Pivot, Crosstown Trail-Connecting Twin Peaks Bio-Region/Glen Canyon, and the San Francisco Bay Area Water Trail.

In May 2019, the MTC Commission and Executive Board adopted an update to the Regional Growth Framework, including updated criteria for PDAs and PCAs, and a new Priority Production Area (PPA) pilot program, which promotes middle-wage jobs and support the region’s industrial economy. San Francisco worked with MTC to expand the coverage of existing PDAs and identify four new PDAs, eight new PCAs, and one PPA designation as part of the ongoing update to Plan Bay Area. These additional PDAs ensure their eligibility for regional OBAG and other funding, and that more of the region’s areas well-served by transit and with high access to opportunity are included in the PDA framework and considered for investment as they grow. In total, fifteen Priority Development Areas (PDAs) have been adopted by the City (a map of the PDAs can be found in Chapter 6).

As a part of Plan Bay Area, the region committed to identify funding incentives for PDAs and PCAs, most significantly through the One Bay Area Grant (OBAG) Program which provides a four or five year framework for the federal Surface Transportation Program and the Congestion Mitigation and Air Quality Improvement Program funds programmed by MTC. OBAG Cycle 1 covered Fiscal Years 2012/13 through 2016/17; OBAG Cycle 2 covered Fiscal Years 2017/18 through 2021/22, and OBAG Cycle 3 covers Fiscal Years 2022/23 through 2025/26. OBAG Cycle 2 built upon OBAG Cycle 1 with an added focus on affordable housing and anti-displacement policies in light of the region’s current housing crisis. OBAG Cycle 3 built further upon OBAG Cycle 2, requiring compliance with state housing laws related to accessory dwelling units, density bonuses, and the Housing Accountability Act. Approximately 50% of OBAG Cycle 3 funds are passed to county Congestion Management Agencies (CMAs), including the Transportation Authority for San Francisco, to nominate projects that help advance the transportation and land use vision expressed in Plan Bay Area 2050. For the OBAG Cycle 3 county grant program:

- Funds were distributed to the region’s nine CMAs using a funding formula that was based 50 percent on population, 20 percent on future housing growth assigned through the Regional Housing Needs Allocation, and 30 percent on housing production between 2007 and 2019. The formula placed additional emphasis on affordable housing, defined as including very low-, low-, and moderate-income households.
- Scoring methodologies were required to provide a reward for jurisdictions with the most effective affordable housing and anti-displacement policies.
- San Francisco and the other larger CMAs were required to program 70 percent of funds to support PDAs (smaller CMAs were required to program 50 percent of funds to support PDAs).
- To be eligible to receive funds, all jurisdictions were required to have a certified Housing Element, have adopted a Complete Streets policy, and have complied with state housing laws related to surplus lands, accessory dwelling units, density bonuses, and the Housing Accountability Act.
- Jurisdictions were required to adopt Local Road Safety Plans (e.g. Vision Zero in San Francisco), and priority was given to funding projects that align with and support these plans.
- Fund levels were increased for Healthy, Safe, and Sustainable Streets projects and implementation of projects in Equity Priority Communities that have been prioritized through Community-Based Transportation Plans or Participatory Budgeting processes.

Refer to the Transportation Authority’s OBAG page (see the Bibliography) for the list of funded projects.

A10.2.4 MULTI-AGENCY LAND USE AND TRANSPORTATION STUDIES

In addition to projects identified to receive PDA Planning Funds, San Francisco is leading or plans to lead several studies in which transportation is closely tied to land use development. All planned development areas are located within PDAs and involve a multi-agency approach in which the Transportation Authority has a supporting role.

Link21 – New Transbay Rail Crossing

Following from the long-range recommendations of the Core Capacity Transit study (CCTS), BART is conducting a multi-jurisdictional planning process to identify one or more new potential transbay rail crossings. This study is being conducted jointly with Capitol Corridor and will evaluate both BART and standard gauge rail crossings of the San Francisco Bay. The Transportation Authority, along with other city agencies, will be

coordinating closely with BART, Capitol Corridor, and other agencies, stakeholders, and the public on this study as it unfolds. This study will identify a preferred alternative for a transbay rail crossing.

ConnectSF

The San Francisco Department of Planning, SFMTA, and the Transportation Authority are jointly leading the development of a long-range plan for San Francisco known as ConnectSF. This process includes the development of an updated San Francisco Transportation Plan (SFTP 2050) by the Transportation Authority and an updated General Plan Transportation Element by the Planning Department. The process began by developing a comprehensive vision for the future of transportation that considers how a combination of transportation and land use policy and investments can provide an effective, sustainable, and equitable future for San Francisco. The effort produced a 50-year roadmap to arrive at that future, including policies, planning, project development, and funding strategies. The key outputs for the program include a vision document 2018, the Transit Strategy, the Streets and Freeways Strategy, the SFTP 2050, and an update to the Transportation Element of the San Francisco General Plan.

The ConnectSF team engaged a diverse set of stakeholders to understand priorities and shape study recommendations.

A10.3 List of Neighborhood Transportation Plans and Projects

A list of plans developed with the support of the Community Based Transportation Planning program and the Neighborhood Transportation Improvement Program is provided below.

The Community Based Transportation Planning program supported development of the following plans:

- Visitacion Valley and Portola Community Based Transportation Plan (2023)
- Lake Merced Pedestrian Safety Project Community Based Transportation Plan (2021)
- Portsmouth Square Community Based Transportation Plan (2021)
- Bayview Community Based Transportation Plan (2020)
- Western Addition Community Based Neighborhood Transportation Plan (also funded with NTIP funds) (2017)

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- Chinatown Neighborhood Transportation Plan and Pilot Study (2015)
 - Potrero Hill Neighborhood Transportation Plan (2015)
 - Western SOMA Neighborhood Transportation Plan (2012)
 - Bayview Hunters Point Neighborhood Transportation Plan (2010)
 - Columbus Avenue Neighborhood Transportation Plan (2010)
 - 19th Avenue Park Presidio Neighborhood Transportation Plan (2008)
 - Mission-Geneva Neighborhood Transportation Plan (2007)
 - Mission South of Chavez Neighborhood Transportation Plan (2007)
 - Tenderloin-Little Saigon Neighborhood Transportation Plan (2007)

The Neighborhood Transportation Program has recently supported the following planning projects (* indicates projects that are underway):

- District 1: Multimodal Transportation Plan (anticipated 2024)*
- District 1: Golden Gate Park Stakeholder Working Group and Action Framework (2021)
- District 1: Fulton Street Safety Project (2020)
- District 3: Walter U Lum Place Public Space Study*
- District 4: District 4 Mobility Improvements Study (2021)
- District 5: Octavia Boulevard Circulation and Accessibility Study Update (2023)
- District 6: Treasure Island Supplemental Transportation Study (2023)
- District 7: Ocean Avenue Action Plan (2023)
- District 7: Inner Sunset Multimodal Safety and Access Study*
- District 9: Alemany Realignment Study (2017)
- District 10: District 10 15 Third Street Bus Study (2020)
- District 11: Alemany Safety Project (2020)

A10.4 Transportation Impact Analysis Studies

A10.4.1 UNIFORM LAND USE ANALYSIS METHODOLOGY

The Transportation Authority uses tools and analysis techniques that use regionally-consistent land use assumptions. For example, in updating the SFTP

the Transportation Authority used land use forecasts developed by the Planning Department (subject to regional requirements for consistency with ABAG), generated new estimates of future travel demand, and tested alternative projects and investment strategies to address those future transportation needs.

A10.4.2 TRANSPORTATION SUSTAINABILITY FEE

In the City and County of San Francisco the only citywide transportation impact fee until recently was the Transit Impact Development Fee (TIDF). First enacted in 1981, the Downtown TIDF ordinance was enacted as a means to have new development pay its fair share for expanded transit capacity to serve that development. TIDF assesses a one-time fee per square foot on new or converted office space in the downtown area. The fee was imposed on most nonresidential development in San Francisco and not on residential development. The 2004 TIDF ordinance established a fee schedule, which is subject to annual adjustment without further action by the Board of Supervisors to reflect changes in the relevant Consumer Price Index, as determined by the City Controller. The impact fee levied on developers must be related to providing new or expanded transit service to support peak period travel generated by new development (including any costs associated with operations or capital). The need for transit services as a result of new development must be established. Furthermore, the proposed expenditures of the fee and the dollar amount of the fee must also have a “nexus” to the development project impacts. The fee schedule was updated in February 2013, based on a nexus study completed in 2011, and is shown in Table A10-1.

Table A10-1. 2013 TIDF Ordinance Fee Schedule

LAND USE CATEGORY	TIDF PER SQ. FT. OF DEVELOPMENT
Visitor Services	\$12.64
Medical and Health Services	\$13.30
Cultural/Institution/Education	\$13.30
Museums	\$11.05
Retail/Entertainment	\$13.30
Management, Information and Professional	\$12.64
Production/Distribution/Repair	\$6.80

Based on another nexus study completed in 2015, the Transportation Sustainability Fee (TSF) was adopted and went into effect in December 2015. The TSF replaces TIDF and would raise new revenue to expand the transportation system as San Francisco grows. New commercial developments, market-rate residential developments with more than 20 units, and certain large institutions will be required to pay the TSF. Affordable housing developments, subsidized middle-income housing, market-rate housing with less than 20 units or less and most nonprofit developments are exempt from the fee. Table A10-2 shows the latest fee schedule (San Francisco Planning Code: Section 411A).

Table A10-2. TSF Ordinance Fee Schedule

LAND USE CATEGORY	TIDF PER SQ. FT. OF DEVELOPMENT
Residential, 21-99 units	\$ 7.74
Residential, all units above 99 units	\$ 8.74
Non-Residential, except Hospitals and Health Services, 800-99,999 gsf	\$ 18.04
Non-Residential, except Hospitals and Health Services, all gsf above 99,999 gsf	\$ 19.04
Hospitals	\$ 18.74
Health Services, all gsf above 12,000 gsf	\$ 11.00
Production, Distribution and Repair	\$ 7.61

Currently, the TIDF generates about \$24 million a year on average. The TSF is projected to add about \$14 million a year, raising nearly \$1.2 billion for transportation improvements over 30 years, or roughly \$430 million in net new revenue. The revenues from the fee may subsidize capital and operating expenses for existing and new transit service. New development generates more transit trips, which add to the already heavily utilized transportation system, especially in the downtown area during peak periods. This, in turn, creates a greater burden on the City transit system. Because transit operates at or near capacity during peak periods, ridership growth must be addressed through increased Muni service frequencies. However, constrained infrastructure (e.g., Market Street tunnel) and reduced operating funding (e.g., from the state) limit the ability of Muni to increase peak-period service.

The TSF is part of a larger effort, the Transit Sustainability Program (TSP), that seeks to improve and expand upon San Francisco’s transportation system to help accommodate new growth. It belongs to the “Invest” component of TSP that aims to invest in the transportation network by having developers pay their fair share to help offset the growth created by their project.

A10.4.3 CEQA TRANSPORTATION IMPACT ANALYSIS REFORM

The California Environmental Quality Act (CEQA) requires California’s public agencies to determine the potential for proposed projects to have significant impacts on the environment, including transportation impacts. CEQA also encourages agencies to develop thresholds of significance – the quantitative point at which an environmental effect may be considered significant – to facilitate these determinations. Beginning on September 15, 2020, new projects were required to include a VMT-based transportation impact significance determination, the culmination of a multi-year effort led by the California Office of Planning and Research (OPR) to implement Senate Bill 743 (SB 743). CEQA gives local jurisdictions discretion to adopt impact measures and significance thresholds, and while many agencies in California measure a project’s effects on transportation using the Highway Capacity Manual’s intersection Level of Service (LOS) measure, which measures delay to automobiles, LOS may no longer be used as a sole measure of transportation impact. These changes better align environmental review with environmental policies, like reducing greenhouse gas emissions.

Prior to statewide implementation of SB 743, the Transportation Authority had a long history of supporting CEQA reform. In October 2008, the Transportation Authority adopted the Final Report on the Automobile Trip Generation Impact Measure as an alternative to automobile LOS. The Report recommends that the City measure the transportation impacts of projects under CEQA based on the net new automobile trips generated (ATG) by a project. In 2009 the Transportation Authority worked with the State Office of Policy and Research to revise the CEQA Guidelines section on transportation impact analysis, which removed the exclusive reference to automobile LOS and replaced it with an option for local jurisdictions to select an alternative measure of transportation impact. The revisions also deleted references to parking as a transportation impact area.

On September 27, 2013, the governor signed into law SB 743, which revised the criteria for determining the significance of transportation impacts within transit priority areas. In the fall of 2014, the State of California Office of Planning and Research released draft guidelines for implementation of SB 743, indicating that vehicle miles traveled (VMT) would be the primary metric for evaluating transportation impacts. In March 2016, San Francisco became the first county to adopt the proposed SB 743, preceding statewide adoption by more than 2 years. The San Francisco Planning Commission adopted a resolution, based on state-proposed guidelines that remove automobile delay as a significant impact on the environment and replaced it with a vehicle miles traveled threshold for all CEQA environmental determinations, including active projects, going forward. In 2018, California adopted CEQA guidelines for implementing SB 743, and on September 15, 2020, all new projects were required to include a VMT-based transportation impact significance determination.

APPENDIX 11

Capital Improvement Program

KEY TOPICS

- Relationship to Regional Transportation Plan and Countywide Transportation Plan
- List of Funding Sources
- Capital Improvement Program Amendments

A11.1 Relationship to Regional Transportation Plan and Countywide Transportation Plan

The CMP statute requires that each CMP be consistent with the long-range Regional Transportation Plan (RTP), developed by the regional transportation planning agency (the Metropolitan Transportation Commission, or MTC, for the Bay Area), and each county's component of the RTP must be supported by a long-range countywide transportation plan (San Francisco Transportation Plan, or SFTP), developed by the CMA. The Capital Improvement Program (CIP) is intended to serve as a short or medium-range implementation vehicle for investment priorities as prioritized in the long-range plans.

Through the RTP, the MTC establishes the Bay Area's vision for transportation with supporting policies and investment strategies, including a list of specific projects and programs. Inclusion of projects and programs in the RTP is a prerequisite for receiving state and federal transportation grants for certain state or federal approvals and a requirement for capacity expanding projects that may have air quality impacts. 2013's Plan Bay Area was the region's first RTP/Sustainable Communities Strategy (SCS) that explicitly integrated transportation projects and policies with land-use strategies to meet the SB 375 requirements to accommodate future population growth and reduce greenhouse gas emissions. MTC and the Association of Bay Area Governments adopted an update to Plan Bay Area, named Plan Bay Area 2050 in fall 2021. An update, Plan Bay Area 2050+, is scheduled to be adopted in late 2025 that will incorporate lessons learned from the pandemic.

The Transportation Authority develops the SFTP (countywide transportation plan) for San Francisco, consistent with MTC guidelines, to guide transportation investment and to serve as a basis for RTP/SCS assumptions. The Transportation Authority updated the SFTP in December 2013, which identified four goals (economic competitiveness, safe and livable neighborhoods, environmental health, and well maintained infrastructure) and proposed scenarios that invest strategically in a diverse set of projects to make progress toward each of the goals. A focused update approved in October 2017 reaffirmed these goals, updated project costs, and reassessed projects previously identified for funding. A major update of the SFTP, named SFTP 2050, was adopted by the Transportation Authority in December 2022. The Transportation Authority ensures the CIP projects, as well as their selection processes, are consistent with the SFTP. The SFTP is discussed in further detail in Chapter 6.

A11.2 List of Funding Sources

As a result of the Transportation Authority's role as the Prop L and Prop AA administrator and the CMA, the capital priorities programming process not only involves state and federal funds that are required by state law to be programmed through the CMP but also incorporates the Prop L and Prop AA programming strategy. Listed below are major CIP funding sources administered by the Transportation Authority. Importantly, as described in Chapter 7, the Transportation Authority ensures that all CIP projects, as well as the programming and project selection processes, are consistent with the RTP, SFTP, and other requirements attached to the funding.

Evaluation of potential impacts of CIP projects on multimodal system performance is embedded throughout the project selection and monitoring processes. The results of the CMP multimodal system performance analysis and any deficiency findings will also be incorporated into the future CIP development as appropriate. Please refer to Chapter 4 for a detailed discussion of multimodal system performance.

A11.2.1 SURFACE TRANSPORTATION PROGRAM / CONGESTION MITIGATION AIR QUALITY PROGRAM

Conformance with the CMP is required for a local jurisdiction to receive federal Surface Transportation Program (STP) funds or Congestion Mitigation and Air Quality Improvement Program (CMAQ) funds. STP funds are among the most flexible and are used to support a wide range of transportation improvement projects across all modes. CMAQ funds are intended for projects that reduce transportation related emissions. Both funds are distributed mainly by the regional transportation planning agency, i.e. the MTC for the Bay Area. The MTC has divided the Bay Area's share of STP and CMAQ funds into multiple programs under the umbrella of the One Bay Area Grant (OBAG) program. Each of the OBAG programs typically has its own associated policies and guidelines in pursuant of RTP goals. The MTC approved a third cycle of OBAG programming (OBAG 3) for Fiscal Years 22/23 through 25/26. One of the centerpieces of OBAG 3 is the county share program, which is intended to better integrate the region's transportation program with land use and housing policies and to promote transportation investments that support Priority Development Areas (PDAs). PDAs refer to locally-identified, regionally designated infill development opportunity areas within existing communities. A map of PDAs is included in Chapter 6 of the main report. The Transportation Authority recommended and MTC approved \$50,577,000 in county share OBAG 3 funds for projects. The Transportation Authority has also provided monitoring and support for sponsor agencies as San Francisco's OBAG projects advance through the design and construction phases under the federal aid guidelines. The bibliography includes a link to the OBAG funded projects list for Cycles 1 through Cycles 3.

A11.2.2 STATE TRANSPORTATION IMPROVEMENT PROGRAM

Inclusion in the CIP is a prerequisite for inclusion in the State Transportation Improvement Program (STIP), a five-year program of projects adopted by the California Transportation Commission (CTC) every two years. Priorities for approximately 75% of the STIP programming capacity are set by regional transportation planning agencies, and the remaining 25% is established by the state. The Regional Transportation Improvement Program (RTIP) is the MTC's submittal to the state, which is merged with other regions' RTIPs and additional CTC priorities to become the STIP. In the Bay Area, the practice has been for the CMAAs to establish priorities for their county share, subject to the MTC's concurrence and the CTC approval of the region's RTIP. In the draft 2024 RTIP, which is pending CTC approval, the Transportation Authority Board continues to fulfill its long-standing commitments to RTIP priorities. As part of the 2024 RTIP, San Francisco fulfilled the county's outstanding commitment to The Portal, also known as Caltrain Downtown Extension (\$17.8 million) and reduced the commitment to the Central Subway (\$17.08 million). RTIP funds cannot be programmed directly to the Central Subway or Downtown Extension projects because all the contracts have been awarded, so we are honoring the commitment by programming RTIP funds to the other eligible projects.

The STIP used to be a significant, although highly variable source of state funds for highways, local streets and roads, transit rehabilitation and expansion projects, and pedestrian and bicycle projects. With reduced revenues from fuel taxes and lack of an adequately funded multi-year federal transportation bill, the STIP experienced a drastic reduction in available funding. However, the passage of Senate Bill 1 in 2017 has helped to stabilize the program. The 2024 RTIP, which lists the priorities approved by the Transportation Authority Board, is expected to be approved through the CTC's STIP adoption in March 2024.

A11.2.3 PROP L TRANSPORTATION SALES TAX

Since 1990, San Francisco has had a half-cent local sales tax for transportation improvements. San Francisco voters approved the first such sales tax and expenditure plan in November 1989 as Proposition B and the second in November 2003 as Proposition K. In November 2022, voters approved Proposition L and adopted a new 30-year Expenditure Plan, superseding the prior one. At the time of the Expenditure Plan adoption, Prop L was expected to generate \$2.6 billion (in 2020 \$'s) over 30 years and to leverage close to \$23.7 billion in federal, state, and other local funds for transportation projects in San Francisco.

The Expenditure Plan established five overall categories of investment and attached mandatory percentage shares of total Prop L revenues: Transit Maintenance and Enhancements (41.2%), Major Transit Projects (22.6%), Streets and Freeways (18.9%), Paratransit (11.4%), and Transportation System Development and Management (5.9%). The Expenditure Plan details eligible sponsors and project types for 28 programs,

ranging from the Caltrain Downtown Rail Extension, to street resurfacing, to pedestrian and bicycle improvements to transit vehicle replacements to transportation demand management. The bibliography provides a link to a summary of the Expenditure Plan, which lists the eligible projects and programs along with their shares of Prop L funds and expected leveraging goals.

As required by the Expenditure Plan, the Transportation Authority Board adopts a Prop L Strategic Plan to guide the day-to-day implementation of the Prop L program, and for each of the programmatic categories, a 5-Year Prioritization Program (5YPP). The Prop L Strategic Plan is the financial tool that guides the timing and allocation of Prop L revenues over the 30-year Expenditure Plan period, and it considers many factors, such as the presence of matching funds and the likelihood of projects to move forward in the year proposed. The 5YPP includes prioritization criteria, a five-year list of projects (with scope, schedule, cost, and funding information), and performance measures. The Strategic Plan and 5YPPs are updated quinquennially and may, between quinquennial updates, be amended as needed. The Transportation Authority is currently in the process of developing the Prop L Strategic Plan (final approval anticipated in early 2024) and the inaugural 5YPPs.

A11.2.4 PROP AA VEHICLE REGISTRATION FEE

Prop AA is a \$10 countywide annual vehicle registration fee that was passed by San Francisco voters in 2010. Total revenues are estimated over the 30-year period at approximately \$150 million, or approximately \$5 million annually, to fund smaller, high-impact projects throughout the city on a pay-as-you-go basis. The Prop AA Expenditure Plan established three categories of investment and prescribed percentage shares over 30 years: Street Repair & Reconstruction (50%), Pedestrian Safety (25%), and Transit Reliability & Mobility Improvements (25%). The Expenditure Plan requires that the Transportation Authority adopt a Strategic Plan to guide the timing of expenditures and set policies for day-to-day management of the program and to update it every five years. In 2012, the Transportation Authority Board approved the first Prop AA Strategic Plan with \$25.1 million to projects over the five year period of Fiscal Year 2012/13 through Fiscal Year 2016/17. In 2017, the Board approved the first update to the Strategic Plan, with \$22.8 million programmed to projects over the five year period of Fiscal Year 2017/18 to Fiscal Year 2021/22. The Strategic Plan was updated again in 2022 with \$23.5 million programmed to 15 projects over Fiscal Years 2022/23 through 2026/27. The bibliography provides a link to the 2022 Prop AA Strategic Plan Programming and Allocations.

A11.2.5 TRANSPORTATION FUND FOR CLEAN AIR

The Transportation Fund for Clean Air Program (TFCA) was established to fund cost effective transportation projects that achieve a reduction in motor vehicle emissions. Funds are generated from a \$4 surcharge on the vehicle registration fee. Forty percent of the funds are set aside for Program Managers for each of the nine counties in the

Bay Area Air Quality Management District (BAAQMD). The Transportation Authority is the designated TFCA Program Manager for San Francisco. In that capacity, it programs approximately \$800,000 every year to clean air vehicles, shuttle operations, bicycle and pedestrian improvements, and other eligible transportation projects that help clean up the air by reducing motor vehicle emissions. The Transportation Authority also provides assistance to project sponsors in applying for Regional TFCA funds, programmed directly by the BAAQMD. The remaining sixty percent of the revenues, referred to as the Regional Fund, is distributed to applicants from the nine Bay Area counties through a variety of grant programs. The bibliography provides a link to the 2023-24 TFCA funded projects summary.

A11.2.6 LIFELINE TRANSPORTATION PROGRAM

The MTC established the Lifeline Transportation Program (LTP) to improve transportation choices for low-income persons as part of the 2005 RTP. For the Cycle 5 LTP, the MTC assigned approximately \$2.69 million in State Transit Assistance (STA) funds to the Transportation Authority. Since the adoption of the Cycle 5 LTP program of projects in May 2018, the Transportation Authority has provided monitoring and support for sponsor agencies and created the San Francisco Lifeline Transportation Program (SF LTP).

In February 2018, the MTC established a transit-focused STA County Block Grant program, with funds from the regional paratransit program, the northern counties/ small transit operators program, and the regional LTP, to be administered by CMAs. The STA County Block Grant program allows each county to determine how to invest in paratransit, transit operating and capital needs, including providing lifeline transit services. Funds were distributed among the nine Bay Area counties based on the amount that each county would have received in Fiscal Year 2018/19 under the former regional programs. For the first two years of the new block grant program, Fiscal Years 2018/19 and 2019/20, San Francisco received approximately \$8.3 million.

In December 2018, the Transportation Authority Board approved the San Francisco STA County Block Grant Framework to distribute 40% of the funds to the SFMTA's paratransit program consistent with what SFMTA would have received under the prior regional paratransit program. The Board approved the remaining 60% for the new SF LTP modelled on the former regional LTP. In April 2019, the Transportation Authority Board approved the SF LTP Cycle 1 program of projects to address gaps or barriers identified through equity assessments and collaborative and inclusive community-based planning processes.

In light of the significant decline in transit fare and other operating revenues due to the COVID-19 pandemic, in April 2020, the Board approved San Francisco's share of Fiscal Year 2020/21 County Block Grant funds to support the San Francisco Municipal Transportation Agency's paratransit operations. In addition, SFTP funds continue

to support the Bay Area Rapid Transit District's Elevator Attendant Program at the downtown stations. The bibliography provides a link to the LTP funded projects summary. This funding distribution between paratransit operations and BART's Elevator Attendant Program has continued in Fiscal Year 2021/22 through Fiscal Year 2023/24.

A11.2.7 SENATE BILL 1 LOCAL PARTNERSHIP PROGRAM FORMULAIC SHARES

The Local Partnership Program (LPP), created by the Road Repair and Accountability Act of 2017 or Senate Bill 1, is a program created to reward local or regional transportation agencies that have sought and received voter approval of taxes or fees solely dedicated to transportation. Of the \$200 million appropriated annually, the California Transportation Commission (CTC) allocates 50% of the program through a Formulaic Program based on both the share of revenues and population of counties with voter-approved sales taxes, tolls, or fees. As administrator of San Francisco's Prop L transportation sales tax, Prop AA annual vehicle registration fee, and TNC Tax, the Transportation Authority is responsible for programming San Francisco's share of the LPP Formulaic Program. The bibliography provides a link to the 2018 through 2022 LPP Formulaic Program of Projects, adopted by the CTC in August 2023. For the current funding cycle covering Fiscal Years 2023/24 - 2024/25, San Francisco will receive \$8.758 million based on Prop K, Prop AA, and the TNC tax revenues as well as a one-time \$5 million bump from LPP incentive funds to reward San Francisco for passing Prop L in November 2022. In November 2023, the Board approved \$2.6 million in LPP formulaic funds for the Yerba Buena Island (YBI) Hillcrest Road Improvement Project to accommodate the YBI Multi-use Path.

A11.2.8 TRAFFIC CONGESTION MITIGATION TAX

On November 5, 2019, San Francisco voters approved Prop D, enabling the City to impose a 1.5% business tax on shared rides and 3.25% business tax on private rides for fares charged by commercial ride-share and driverless-vehicle companies until November 5, 2045. The Traffic Congestion Mitigation Tax, referred to as the TNC Tax, was expected to generate about \$30 million annually, before the COVID-19 pandemic. Half of the revenue goes to the SFMTA for transit improvements. The Transportation Authority administers the other half of the funds for street safety improvements. Revenue collection began on January 1, 2020.

On October 27, 2020, the Transportation Authority Board adopted the TNC Tax Program Guidelines and programmed \$7.5 million to the SFMTA's Vision Zero Quick-Build Program. In March 2023, the Transportation Authority Board adopted the first update to the Program Guidelines and programmed \$21.6 million to the SFMTA for the Vision Zero Quick-Build Program and the new, rolling Application-Based Residential Traffic Calming Program. The bibliography provides a link to the TNC Tax funded projects summary.

A11.3 Capital Improvement Program Amendments

The project sponsor is expected to deliver a project or program as approved by the Board. If a project sponsor anticipates that the scope, schedule, budget or funding plan will change, Transportation Authority staff will assess the need for a CIP amendment. There are two types of CIP amendments – administrative and policy level. Administrative amendments are approved by the Transportation Authority's Executive Director or her designee. Policy-level amendments must be approved by the Transportation Authority Board. The type of approval required by an amendment request depends upon the significance of the proposed changes to the project's scope, schedule and budget.

A11.3.1 ADMINISTRATIVE-LEVEL CIP AMENDMENTS

Administrative-level amendments address minor changes that do not substantively change the nature of the original project and its impact on system performance, and do not increase the amount of funding allocated or programmed by the Transportation Authority to the project. Administrative amendments will only require notification to and approval by the Transportation Authority's Executive Director or their designee. The Executive Director may rule that a requested CIP amendment is administrative if the proposed changes, involving one or more projects and one or more funding sources, requires programming actions that can be authorized at the staff level at the Transportation Authority, at the MTC and/or the CTC, or at the regional office level for federal agencies, such as administrative TIP amendments.

A11.3.2 POLICY-LEVEL CIP AMENDMENTS

Policy-level amendments apply to changes that are deemed by the Transportation Authority to be significant enough that they have the potential to affect the performance of the multimodal transportation system and represent a significant departure from the scope, schedule, or budget approved by the Transportation Authority. This may include changes that will affect the year of delivery (completion), the amount or availability of operating funds, the year of programming, the fund source designation, or any other aspect of the project requiring action by the MTC and/or the CTC for funds initially prioritized or programmed by the Transportation Authority. Policy-level amendments require approval by the Transportation Authority Board prior to processing of the change by the project sponsor or other funding agency.

A11.3.3 APPLICABILITY OF CIP AMENDMENTS

Applicable funding sources include but are not limited to those programmed directly by the Transportation Authority, such as county share STP/CMAQ, SB 1 Local Partnership Program Formulaic Shares, RIP, LTP, TFCA, Prop L, Prop AA, and TNC

Tax. Certain funding sources are programmed through state or regional processes and typically become available to project sponsors through a separate application procedure. Further, many sources have timely use of funds requirements where failure to meet deadlines can result in loss of funds to the project or to San Francisco or prohibition from applying for future cycles until deadlines are met. The MTC has requested that CMAs assist with oversight of certain funding sources (e.g. Highway Safety Improvement Program) even if not directly prioritized by CMAs. The intent is to improve project delivery and specifically to avoid loss of funds to the region. The Transportation Authority encourages sponsors to proactively notify the Transportation Authority of any project delivery issues or other issues that may threaten a project's ability to meet timely use of fund deadlines, whether sources covered by CIP amendments or not. The Transportation Authority can serve as a resource and facilitator to help resolve delivery issues and avoid loss of funds to San Francisco projects.

APPENDIX 12

Travel Demand Model and Uniform Database

KEY TOPICS

- Technical Approach
- Model Consistency Report

A12.1 Technical Approach

A12.1.1 THE SAN FRANCISCO TRAVEL DEMAND FORECASTING MODEL

The San Francisco Travel Demand Forecasting Model, known as SF-CHAMP, is a tool used to assess the impacts of land use, socioeconomic, and transportation system changes on the performance of the transportation system. SF-CHAMP was developed to reflect the unique transportation, socioeconomic, and land use characteristics of San Francisco and the Bay Area. The Model uses residents' observed travel patterns; detailed representations of the region's transportation systems, population and employment characteristics; tolling and parking pricing; and the number of vehicles available to households to simulate daily travel activity and measure performance. Future year transportation, land use, and socioeconomic inputs are used to forecast future travel demand.

Activity-Based Microsimulation

SF-CHAMP is an activity-based microsimulation model that is sensitive to a broad array of conditions that influence travelers' choices. It is a tour-based model which represents an entire day's travel activity for each Bay Area resident, represented by a synthetic population. A tour is a sequence of trips made by an individual that begins and ends at home, whereas a trip is a single movement from an origin to a destination. This framework allows the model to:

- deal realistically and precisely with trip chaining and interrelationships between individual trips made over the entire day;
- separate travel into mandatory and discretionary tours; and
- attribute benefits and impacts to population groups for equity analysis

Model Applications

The Transportation Authority uses SF-CHAMP to provide detailed forecasts supporting planning applications, including the San Francisco Transportation Plan (SFTP), Strategic Analysis Reports (SARs), policy analyses, mobility assessments, the Regional Transportation Plan, the transportation planning and revenue forecasting for the Treasure Island Mobility Management Agency, and environmental analyses. Current model applications include the 101/280 Express Lanes and Bus Project, the Portal/Downtown Rail Extension, and the Treasure Island Mobility Management Study.

Model Development and Enhancements

The key inputs required to develop and apply a travel demand forecasting model include information on household and individual travel behavior (obtained in a household travel survey), representations of the pedestrian, transit, and roadway

networks, and spatial representations of employment and residential characteristics. Most of the model components were estimated using household travel data from the California Household Travel Survey 2010-2012.

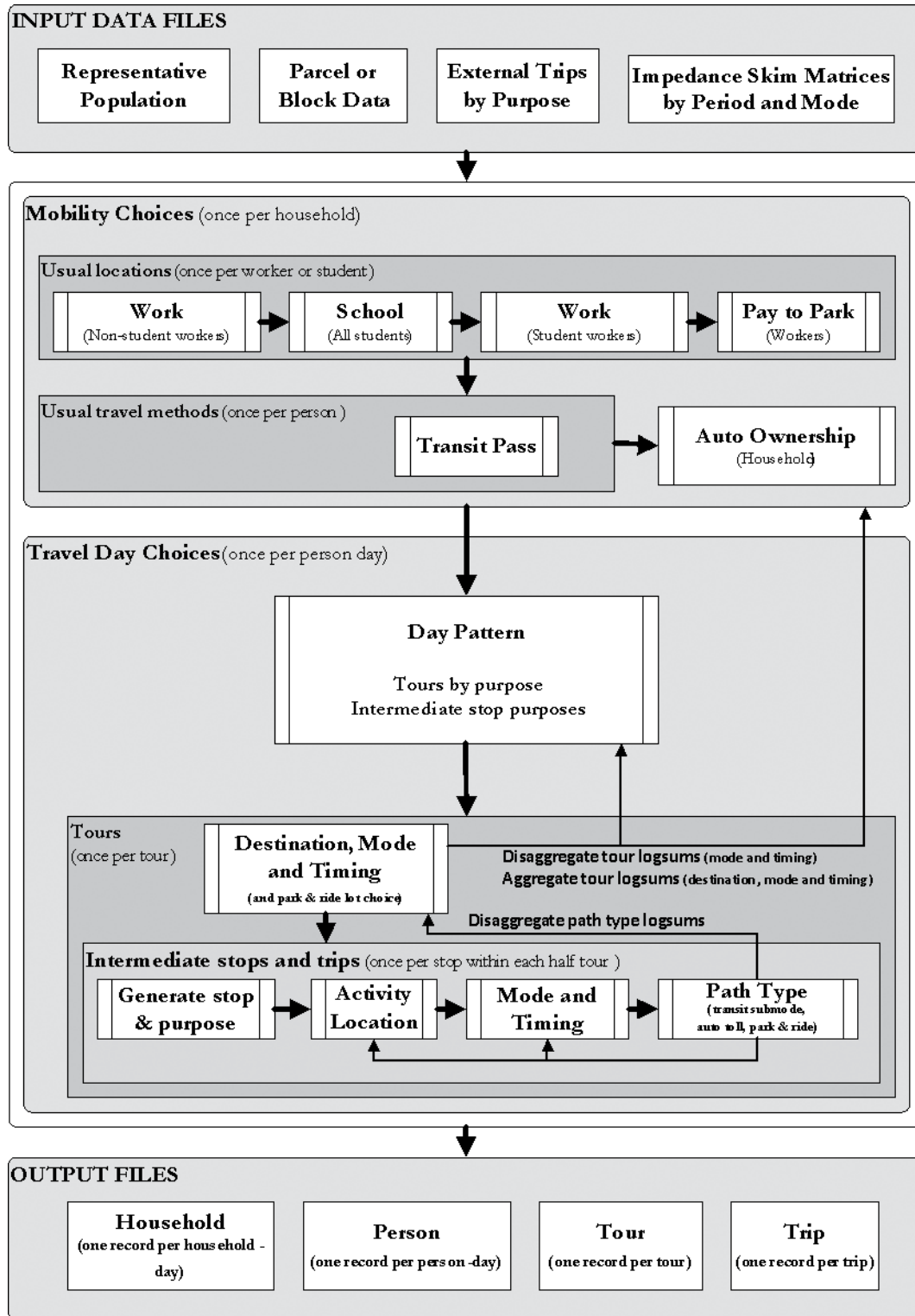
At the time of its initial release, SF-CHAMP was one of the first activity-based travel demand models used in practice and has been continuously used and updated both in order to take advantage of new data, and to be appropriately sensitive to issues confronted in new projects and plans for which it is used. SF-CHAMP version 6.1.2 is the current version of the model.

SF-CHAMP 6.1.2 uses the DaySim demand model (<https://github.com/RSGInc/DaySim/wiki>). DaySim is an open-source travel demand microsimulation package that is used by several regional planning organizations in their travel demand models. DaySim consists of a series of discrete choice models that represent different components of travel decision-making. Each model is estimated and calibrated with observed travel survey data from the California Household Travel Survey 2010-2012. The implementation of DaySim in SF-CHAMP added key functionality to the model, most importantly:

- Departure and arrival times specified by minute
- More detailed trip and tour purpose segmentation
- More detailed "microzone" geography for activity generation

In addition to these new DaySim features, TNCs were added to the mode choice model and calibrated to TNC activity data from the SFCTA's TNCs Today study. Autonomous vehicles were added for exploratory analysis. Truck and commercial vehicle models were separated from a single assignment class into two classes. New vehicle class restrictions were implemented to better represent existing HOV and other vehicle restriction policies. Figure A12-1 shows the model components and workflow of DaySim, the demand model core of SF-CHAMP.

Figure A12-1. DaySim Model Components



Model Input and Components

San Francisco's travel demand model can use any standard set of ABAG land use projections as an input. While some projects use land use estimates prepared specifically for the project, most use ABAG's Plan Bay Area 2050 forecasts for population, households, jobs, and employed residents. Outside of San Francisco, the Plan Bay Area 2050 forecasts are used without modification. Within San Francisco, the San Francisco Planning Department allocates the countywide control totals for population, households, jobs, and employed residents to Transportation Analysis Zones (TAZs). Base year and future year forecasts were developed using a parcel-level residential and employment database, inventories of new development projects under construction, approved, and under review, and information on development potential for major area plans.

The San Francisco 981 TAZ system is used within the City and County of San Francisco. Outside of the City, the San Francisco Model zone system is the same as the MTC Travel Model 1 (TM1) 1,454 zone system. The model has 2,245 zones.

SF-CHAMP's transportation networks are very detailed and use network assumptions consistent with the MTC Regional Transportation Plan. Within San Francisco, the network is an all-streets network which is highly spatially accurate and includes every street segment within the City. The roadway network outside of San Francisco is a simplified network developed from the MTC TM1 regional model highway network. All local and regional transit route alignments and all stop locations are coded in the SF-CHAMP's transit networks. The regional transit network is a simplified network based on MTC's TM1 transit network representation.

Population Synthesis

The model uses a synthesized population of Bay Area residents that matches Traffic Analysis Zone (TAZ) totals of households, population, and employed residents, as well as census-based distributions of household configuration, age, and income-level serve as inputs to the population synthesis model.

The model samples the Census Public Use Microdata Sample (PUMS) (from the American Communities Survey) household records, and then assigns these to the TAZ, based on the control totals and marginal distributions. The result is a file with one record for each decision-maker. It matches all control totals and distributions when aggregated to the TAZ-level.

Vehicle Availability

The vehicle availability model predicts the vehicles available in each household for each Bay Area resident. The model estimates the probabilities of having zero, one, two, or three, or four or more vehicles available. The Model accounts for tradeoffs for auto ownership based on the employment locations of workers in the household. This is a significant factor for auto ownership in a transit-rich environment such as San Francisco.

The vehicle availability model was validated primarily on two key variables, number of workers per household and super district¹, using the 2010 Census and CHTS 2010-2012.

Full Day Pattern Model

The full day pattern model is actually several models used together to predict the main components of all of a person's travel across the day. The Primary Tour Generation Models predict whether each individual will make either no tour on a typical weekday or will make a primary tour for one of the following purposes: work, university, school, escort, meal, social/recreational, shopping, or other. The primary tour is an individual's longest tour. These primary tours are home-based. Work-based sub-tours and secondary home-based tours are also predicted. The models also predict whether there are intermediate stops on each tour half. Subsequent models predict the exact number of intermediate stops on each tour leg.

Tour mode constrains trip modes within the tour, and informs the timing and location of intermediate stops, sub-tours and secondary tours. The day pattern models were estimated using the CHTS 2010-2012.

Time of Day Models

The time-of-day model predicts the time (at the minute level) when the traveler leaves home to begin the primary tour simultaneously with the time the traveler leaves the primary destination to return home. It also predicts the times of intermediate stops. While trip arrival and departure times are estimated at the half-hour level, and then disaggregated to the minute, they are assigned to networks in 5 time periods:

- Early (3:00 AM to 5:59 AM)
- AM peak (6:00 AM to 8:59 AM)
- Midday (9:00 AM to 3:29 PM)
- PM peak (3:30 PM to 6:29 PM)
- Late (6:30 PM to 2:59 AM)

Destination Choice Models

The destination choice models estimate destinations for tours and trips generated by the day pattern model. The San Francisco DaySim Model uses destination choice models for work, school, and other tours, work-based sub-tours, and intermediate stops. The stops for work-based sub-tours and intermediate stops are conditional on the primary destination. The Destination Choice Models were estimated using the 2010-2012 CHTS.

¹ Superdistrict is a geographic area defined by MTC.

Mode Choice Models

The Mode Choice Models predict the mode for each trip, once destinations have been determined. First, tour mode choice models determine the primary mode for the tour, while trip mode choice models determine the mode for each trip, based on the tour mode. SF-CHAMP uses the following modes:

- Muni Light Rail
- Muni Local Bus
- Regional bus routes (Golden Gate Transit, AC Transit, SamTrans)
- Caltrain
- BART
- Ferry
- Walk
- Bike
- Drive Alone
- Shared Ride 2
- Shared Ride 3+
- TNC

The mode choice models were estimated using the 2010-2012 CHTS, and validated using Census and ACS Journey to Work data, and observed SFMTA, BART, Caltrain, and Ferry ridership levels.

Visitor Models

The visitor models estimate visitor trips by mode, estimated using San Francisco Visitor & Convention Bureau data, and coefficients derived from the Honolulu model visitor development effort.

The visitor models are significantly less complex than the San Francisco resident models. They estimate the number of visitors to 29 key visitor destinations for each of three modes. The destinations include among others, Alcatraz, Golden Gate Park, North Beach, Union Square, and a cable car ride.

Assignment

The detailed estimate of activity patterns of Bay Area travelers (including the type and timing of trips, destinations, and modes of travel) results in tables of trips by mode of travel from zone to zone by time of day. This time period-specific demand is then

assigned to the regional roadway and transit networks. SF-CHAMP 6.1.2 assigns vehicles on the roadway network, and passengers on the transit network.

Roadway assignment predicts the route chosen by travelers based primarily on congested travel times and traveler cost (distance and tolls), using a generalized cost function. Generalized cost is a weighted cost that takes into account vehicle travel time, waiting time, walk access time, transfers, and transfer time. Routes are assigned and congested travel times are updated iteratively until travel times converge in a framework known as static user equilibrium.

Transit assignment predicts the specific route chosen, including transfers, based on walking time to the nearest stop, expected wait time, presence of other transit alternatives, fares, in-vehicle travel time, and walk time to the final destination. The transit assignment algorithm minimizes the generalized cost by origin-destination pair and time period.

The validation of transit and highway assignments is done separately, using observed volumes of vehicles and passengers on the highway and transit systems, respectively. Assignment validation at the county level was completed using aggregated volumes by corridor (identified by screenlines), type of service (facility type, mode or operator), size (volume group), and time period. Speeds and travel times are also used in highway and transit validations to ensure that these are accurately represented in the models.

A12.1.2 GIS DATABASE AND TOOLS

The Transportation Authority uses a Geographic Information Systems (GIS) database coupled with a variety of GIS tools, including QGIS, ESRI's ArcGIS, and python geoprocessing packages like shapely and geopandas to complement the strategic analysis facilitated by SF-CHAMP. The Transportation Authority's GIS database includes a large repository of shape files corresponding to local and regional street networks, census tracts, census block groups, census blocks, TAZs, transit routes, public facilities, and more, updated periodically from source data.

The Transportation Authority also maintains a geodatabase of level-of-service data containing auto and transit travel time and speed data for CMP segments, updated biennially.

A12.2 Model Consistency Report

A12.2.1 GENERAL TRAVEL MODELING APPROACH

The San Francisco County travel demand forecasting model (see the San Francisco Chained Activity Modeling Process, or "SF-CHAMP") was originally developed for the San Francisco County Transportation Authority (Authority) to provide detailed forecasts of travel demand for various planning applications. These applications

included developing a countywide plan, providing input to microsimulation modeling for corridor and project-level evaluations, transit planning, neighborhood planning, and land use impacts analysis for Congestion Management Program purposes. The objective was to accurately represent the complexity of the destination, temporal and modal options and provide detailed information on travelers making discrete choices. These objectives led to the development of an activity-based model that uses synthesized population as the basis for decision-making rather than zonal-level aggregate data sources.

The Authority continually updates and refines SF-CHAMP. Since the creation of SF-CHAMP in 2000, the model's geographic scope has been extended to the full nine-county Bay Area, along with significant improvements to pricing sensitivity and time-of-day modeling. The Metropolitan Transportation Commission (MTC) has also now developed an activity based model with a similar structure. Both models share a common population synthesizer, while the details of many model subcomponents differ in significant ways.

SF-CHAMP version 6.1.2 is the current version of the model. SF-CHAMP 6.1.2 uses the DaySim demand model (<https://github.com/RSGInc/DaySim/wiki>). DaySim is an open-source travel demand microsimulation package that is used by several regional planning organizations in their travel demand models. DaySim consists of a series of discrete choice models that represents different components of travel decision-making. Each model is estimated and calibrated with observed travel survey data from the California Household Travel Survey 2010-2012.

A12.2.2 DEMOGRAPHIC / ECONOMIC / LAND USE

The SF-CHAMP model can use a variety of land use inputs. While some projects use land use estimates prepared specifically for the project, most use ABAG's Plan Bay Area 2050 forecasts for population, households, jobs, and employed residents. Outside of San Francisco, the Plan Bay Area 2050 forecasts are used with only minor modification to convert between the job classifications used by Travel Model 1.5 and those used by SF-CHAMP. Within San Francisco, the San Francisco Planning Department allocates the countywide control totals for population, households, jobs, and employed residents to Transportation Analysis Zones (TAZs).

Assumptions

Product 2: A statement establishing that the differences between key ABAG land use variables (i.e., population, households, jobs, and employed residents) and those of the CTA fall within a minimum/maximum range for the base year. If the CTA has other preferred sources of data that conflict with the ABAG data, documentation about the sources and the differences will be provided.

For the base year 2015, the population is within the required range for all counties. However, the following county estimates fall outside of MTC’s guidelines: households in San Francisco; and jobs in San Mateo, Santa Clara, and Sonoma. Job totals differ, and have historically differed, from ABAG’s projections because SF-CHAMP uses a combination of SIC and NAICS codes which must be converted from the ABAG forecasts. Table A12-1, Table A12-2, Table A12-3, and Table A12-4 show the SF-CHAMP land use comparisons as a percentage difference from the midpoint of the target range, and whether the value falls within the range.

Product 3: A table comparing the MTC/ABAG land use estimates with the CMA land use estimates by county and superdistrict for population, households, jobs, and employed residents for the base year.

Table A12-1. Comparison of SF-CHAMP to ABAG County-Level Estimates for Population, Households, Jobs, and Employed Residents, Year 2015, Plan Bay Area 2050

COUNTY	SF-CHAMP 6.1.2				DIFFERENCE FROM MTC/ABAG RANGE MIDPOINT				WITHIN MTC/ABAG RANGE			
	POPULATION	HOUSEHOLDS	JOBS	EMPLOYED RESIDENTS	POPULATION	HOUSEHOLDS	JOBS	EMPLOYED RESIDENTS	POPULATION	HOUSEHOLDS	JOBS	EMPLOYED RESIDENTS
San Francisco	883,655	352,261	679,065	509,975	+1%	-2%	+3%	+0%	Yes	No	Yes	Yes
San Mateo	773,428	265,263	388,034	400,481	+1%	+1%	-2%	-1%	Yes	Yes	No	Yes
Santa Clara	1,915,334	622,568	1,114,426	956,289	+0%	-1%	+7%	-1%	Yes	Yes	No	Yes
Alameda	1,597,004	551,624	854,070	850,478	-1%	-2%	+2%	+1%	Yes	Yes	Yes	Yes
Contra Costa	1,123,642	382,537	405,210	593,398	+0%	-1%	-1%	+5%	Yes	Yes	Yes	Yes
Solano	433,938	141,807	134,360	232,652	+1%	-2%	-7%	+7%	Yes	Yes	Yes	Yes
Napa	145,511	50,384	71,685	80,499	+2%	+1%	-9%	+6%	Yes	Yes	Yes	Yes
Sonoma	510,791	187,974	220,585	281,365	+1%	-1%	-4%	+6%	Yes	Yes	No	Yes
Marin	272,286	108,618	134,982	135,846	+3%	+2%	-1%	+2%	Yes	Yes	Yes	Yes
Bay Area	7,655,589	2,663,036	4,002,417	4,040,983	+0%	-1%	+2%	+2%	Yes	Yes	Yes	Yes

Table A12-2. Comparison of SF-CHAMP to ABAG Superdistrict-Level Estimates for Population, Households, Jobs, and Employed Residents, Year 2015, Plan Bay Area 2050

SUPERDISTRICT	SF-CHAMP 6.1.2				DIFFERENCE FROM MTC/ABAG RANGE MIDPOINT				WITHIN MTC/ABAG RANGE			
	POPULATION	HOUSEHOLDS	JOBS	EMPLOYED RESIDENTS	POPULATION	HOUSEHOLDS	JOBS	EMPLOYED RESIDENTS	POPULATION	HOUSEHOLDS	JOBS	EMPLOYED RESIDENTS
San Francisco County (Combined)	883,655	352,261	679,065	509,975	+1%	-2%	+3%	+0%	Yes	No	Yes	Yes
North San Mateo County	303,007	97,614	132,271	155,524	-0%	-1%	-0%	-3%	Yes	Yes	Yes	Yes
Central San Mateo County	232,723	87,203	107,218	124,923	+2%	+2%	-6%	+3%	Yes	Yes	No	Yes
South San Mateo County	237,698	80,446	148,545	120,034	+1%	+1%	+1%	-0%	Yes	Yes	Yes	Yes
Northwest Santa Clara County	195,516	73,800	207,353	104,050	+2%	+2%	+35%	+5%	Yes	Yes	No	Yes
North Santa Clara County	289,103	107,031	362,977	154,978	+2%	+1%	+3%	+0%	Yes	Yes	Yes	Yes
West Santa Clara County	340,425	120,736	147,529	170,604	+2%	+1%	+10%	+2%	Yes	Yes	No	Yes
Central Santa Clara County	322,134	105,010	174,287	156,468	-1%	-2%	-2%	-5%	Yes	Yes	No	Yes
East Santa Clara County	417,356	108,117	118,455	193,693	-1%	-3%	-0%	-4%	Yes	Yes	Yes	Yes
Central South Santa Clara County	232,277	73,170	55,601	120,267	+0%	-1%	-6%	+2%	Yes	Yes	No	Yes
South Santa Clara County	118,523	34,704	48,224	56,229	-1%	-4%	-2%	-3%	Yes	Yes	No	Yes
East Alameda County	211,317	72,351	136,383	114,970	-4%	-5%	-1%	-1%	Yes	Yes	Yes	Yes
South Alameda County	344,238	105,035	139,259	189,854	-1%	-1%	-8%	+4%	Yes	Yes	No	Yes
Central Alameda County	376,347	120,401	157,957	192,056	-2%	-3%	-1%	-1%	Yes	Yes	Yes	Yes
North Alameda County	484,047	180,534	272,752	249,878	+1%	-0%	+9%	+2%	Yes	Yes	Yes	Yes
Northwest Alameda County	181,055	73,303	147,719	103,720	-0%	+1%	+8%	+3%	Yes	Yes	Yes	Yes
West Contra Costa County	264,575	88,964	81,432	133,800	+0%	-1%	+6%	+1%	Yes	Yes	No	Yes
North Contra Costa County	235,287	84,786	122,360	135,634	-1%	-3%	+2%	+5%	Yes	Yes	No	Yes
Central Contra Costa County	149,894	60,498	81,375	84,029	+0%	-0%	-0%	+9%	Yes	Yes	Yes	Yes
South Contra Costa County	161,813	54,521	65,544	94,402	+3%	+2%	-5%	+13%	Yes	Yes	No	Yes
East Contra Costa County	312,073	93,768	54,499	145,533	-0%	-2%	-12%	+2%	Yes	Yes	No	Yes
South Solano County	154,155	52,520	47,613	85,531	+2%	-1%	+0%	+10%	Yes	Yes	Yes	Yes
North Solano County	279,783	89,287	86,747	147,121	+0%	-3%	-11%	+6%	Yes	Yes	Yes	Yes
South Napa County	103,568	34,449	48,204	53,937	+1%	-0%	-5%	+1%	Yes	Yes	Yes	Yes
North Napa County	41,943	15,935	23,481	26,562	+6%	+4%	-16%	+18%	Yes	Yes	No	Yes
South Sonoma County	175,085	64,234	70,371	101,374	+1%	-1%	-8%	+7%	Yes	Yes	No	Yes
Central Sonoma County	242,178	88,086	120,327	132,070	-1%	-3%	-2%	+4%	Yes	Yes	Yes	Yes
North Sonoma County	93,528	35,654	29,887	47,921	+7%	+5%	-6%	+8%	Yes	Yes	No	Yes
North Marin County	61,786	23,086	29,220	22,844	-0%	-3%	+3%	-17%	Yes	No	No	Yes
Central Marin County	113,746	44,041	61,257	54,956	+3%	+2%	-1%	-0%	Yes	Yes	Yes	Yes
South Marin County	96,754	41,491	44,505	58,046	+5%	+5%	-3%	+15%	Yes	Yes	Yes	Yes
Bay Area	7,655,589	2,663,036	4,002,417	4,040,983	+0%	-1%	+50%	+2%	Yes	Yes	Yes	Yes

Product 4: A table with CTA land use estimates by TAZ for the base year. Where differences exist between MTC/ABAG estimates, documentation of the CTA data sources should be included.

CHAMP TAZ inputs are shared on SFCTA’s CMP report webpage. Numbers within San Francisco are adjusted based on parcel-level data provided by the San Francisco Planning Department.

Forecasts

Product 5: A statement establishing that the differences between key ABAG land use variables (i.e., population, households, jobs, and employed residents) and those of the CTA fall within plus or minus one percent for the horizon year at both the county and superdistrict level for the subject county. A statement establishing that no differences exist at the TAZ-level outside the county between the MTC/ABAG forecast or the MTC/ABAG/CTA revised forecast.

For the forecast year 2050, all countywide population, households, jobs, and employed residents estimates are within MTC’s published ranges. For all counties outside of San Francisco, population, households, and employed residents match ABAG’s Plan Bay Area 2050 final land use projections at the county and TAZ levels exactly. Job totals differ, and have historically differed, from ABAG’s projections because SF-CHAMP uses a combination of SIC and NAICS codes which must be converted from the ABAG forecasts. Table A12-3 and Table A12-4 show the SF-CHAMP land use comparisons as a percentage difference from the midpoint of the target range, and whether the value falls within the range.

Product 6: A table comparing the MTC/ABAG land use estimates with the CTA land use estimates by county and superdistrict for population, households, jobs, and employed residents for the horizon year.

Table A12-3. Comparison of SF-CHAMP to ABAG County-Level Estimates for Population, Households, Jobs, and Employed Residents, Forecast Year 2050, Plan Bay Area 2050

COUNTY	SF-CHAMP 6.1.2				DIFFERENCE FROM MTC/ABAG RANGE MIDPOINT				WITHIN MTC/ABAG RANGE			
	POPULATION	HOUSEHOLDS	JOBS	EMPLOYED RESIDENTS	POPULATION	HOUSEHOLDS	JOBS	EMPLOYED RESIDENTS	POPULATION	HOUSEHOLDS	JOBS	EMPLOYED RESIDENTS
San Francisco	1,272,809	579,398	927,214	708,929	+0%	+0%	+1%	+0%	Yes	Yes	Yes	Yes
San Mateo	1,014,522	393,773	504,392	521,058	+0%	+0%	-1%	+0%	Yes	Yes	Yes	Yes
Santa Clara	2,891,405	1,075,198	1,620,293	1,477,679	+0%	+0%	+1%	+0%	Yes	Yes	Yes	Yes
Alameda	2,175,848	846,769	1,172,051	1,150,919	+0%	+0%	-1%	+0%	Yes	Yes	Yes	Yes
Contra Costa	1,454,978	551,378	535,758	766,250	+0%	+0%	+0%	+0%	Yes	Yes	Yes	Yes
Solano	489,891	176,532	200,759	257,114	+0%	+0%	-0%	+0%	Yes	Yes	Yes	Yes
Napa	146,868	55,601	87,360	78,599	+0%	+0%	+1%	+0%	Yes	Yes	Yes	Yes
Sonoma	540,553	219,939	252,988	294,059	+0%	+0%	+1%	+0%	Yes	Yes	Yes	Yes
Marin	338,531	145,752	116,657	164,885	+0%	+0%	-0%	+0%	Yes	Yes	Yes	Yes
Bay Area	10,325,405	4,044,340	5,417,472	5,419,492	+0%	+0%	+0%	+0%	Yes	Yes	Yes	Yes

Table A12-4. Comparison of SF-CHAMP to ABAG Superdistrict-Level Estimates for Population, Households, Jobs, and Employed Residents, Forecast Year 2050, Plan Bay Area 2050

SUPERDISTRICT	SF-CHAMP 6.1.2				DIFFERENCE FROM MTC/ABAG RANGE MIDPOINT				WITHIN MTC/ABAG RANGE			
	POPULATION	HOUSEHOLDS	JOBS	EMPLOYED RESIDENTS	POPULATION	HOUSEHOLDS	JOBS	EMPLOYED RESIDENTS	POPULATION	HOUSEHOLDS	JOBS	EMPLOYED RESIDENTS
San Francisco County (Combined)	1,272,809	579,398	927,214	708,929	+0%	+0%	+1%	+0%	Yes	Yes	Yes	Yes
North San Mateo County	446,596	166,385	191,809	226,759	+0%	+0%	+2%	+0%	Yes	Yes	No	Yes
Central San Mateo County	288,235	121,281	120,666	153,304	+0%	+0%	-2%	+0%	Yes	Yes	No	Yes
South San Mateo County	279,691	106,107	191,917	140,995	+0%	+0%	-2%	+0%	Yes	Yes	No	Yes
Northwest Santa Clara County	238,000	102,007	238,145	134,028	+0%	+0%	+15%	+0%	Yes	Yes	No	Yes
North Santa Clara County	755,032	319,501	617,368	422,204	+0%	+0%	-2%	+0%	Yes	Yes	No	Yes
West Santa Clara County	432,774	171,671	197,916	216,772	+0%	+0%	+1%	+0%	Yes	Yes	Yes	Yes
Central Santa Clara County	442,641	167,780	254,891	216,707	+0%	+0%	-3%	+0%	Yes	Yes	No	Yes
East Santa Clara County	630,967	180,095	168,482	288,788	+0%	+0%	-1%	+0%	Yes	Yes	Yes	Yes
Central South Santa Clara County	257,580	91,229	76,604	135,025	+0%	+0%	-1%	+0%	Yes	Yes	Yes	Yes
South Santa Clara County	134,411	42,915	66,887	64,155	+0%	+0%	-1%	+0%	Yes	Yes	No	Yes
East Alameda County	347,087	131,853	157,648	198,659	+0%	+0%	+1%	+0%	Yes	Yes	No	Yes
South Alameda County	444,435	152,142	218,351	242,395	+0%	+0%	-1%	+0%	Yes	Yes	No	Yes
Central Alameda County	449,407	160,465	287,284	219,870	+0%	+0%	+1%	+0%	Yes	Yes	Yes	Yes
North Alameda County	686,887	287,103	354,220	351,967	+0%	+0%	-1%	+0%	Yes	Yes	No	Yes
Northwest Alameda County	248,032	115,206	154,548	138,028	+0%	+0%	-5%	+0%	Yes	Yes	No	Yes
West Contra Costa County	329,145	122,677	132,193	165,188	+0%	+0%	+0%	+0%	Yes	Yes	Yes	Yes
North Contra Costa County	343,027	133,900	183,194	187,934	+0%	+0%	-1%	+0%	Yes	Yes	Yes	Yes
Central Contra Costa County	194,686	88,909	77,176	114,219	+0%	+0%	+5%	+0%	Yes	Yes	No	Yes
South Contra Costa County	183,079	69,851	61,404	113,623	+0%	+0%	+2%	+0%	Yes	Yes	No	Yes
East Contra Costa County	405,041	136,041	81,791	185,286	+0%	+0%	-2%	+0%	Yes	Yes	No	Yes
South Solano County	151,361	57,065	63,020	81,375	+0%	+0%	+1%	+0%	Yes	Yes	No	Yes
North Solano County	338,530	119,467	137,739	175,739	+0%	+0%	-1%	+0%	Yes	Yes	No	Yes
South Napa County	107,861	39,577	67,269	54,049	+0%	+0%	+2%	+0%	Yes	Yes	No	Yes
North Napa County	39,007	16,024	20,091	24,550	+0%	+0%	-2%	+0%	Yes	Yes	No	Yes
South Sonoma County	203,251	83,297	77,967	116,405	+0%	+0%	-3%	+0%	Yes	Yes	No	Yes
Central Sonoma County	243,845	97,646	136,898	130,771	+0%	+0%	+4%	+0%	Yes	Yes	No	Yes
North Sonoma County	93,457	38,996	38,123	46,883	+0%	+0%	-4%	+0%	Yes	Yes	No	Yes
North Marin County	71,719	29,637	29,426	26,913	+0%	+0%	+2%	+0%	Yes	Yes	No	Yes
Central Marin County	160,599	65,866	47,357	73,361	+0%	+0%	-3%	+0%	Yes	Yes	No	Yes
South Marin County	106,213	50,249	39,874	64,611	+0%	+0%	+1%	+0%	Yes	Yes	Yes	Yes
Bay Area	10,325,405	4,044,340	5,417,472	5,419,492	+0%	+0%	+0%	+0%	Yes	Yes	Yes	Yes

Product 7: If land use estimates within the CTA's county or superdistricts are modified from MTC/ABAG's projections, agendas, discussion summaries, and action items from each meeting held with cities, MTC, and/or ABAG at which the redistribution was discussed, as well as before/after census-tract-level data summaries and maps.

Consistent with decades of past practice, the San Francisco Planning Department adjustments to the distribution of households and jobs within San Francisco are depicted

in Figure A12-2 and Figure A12-3 respectively. The differences are based on the year-specific zoning, area plans, project development pipeline and a capacity analysis.

Figure A12-2. Difference in Households from Plan Bay Area 2050 (CHAMP net of MTC)

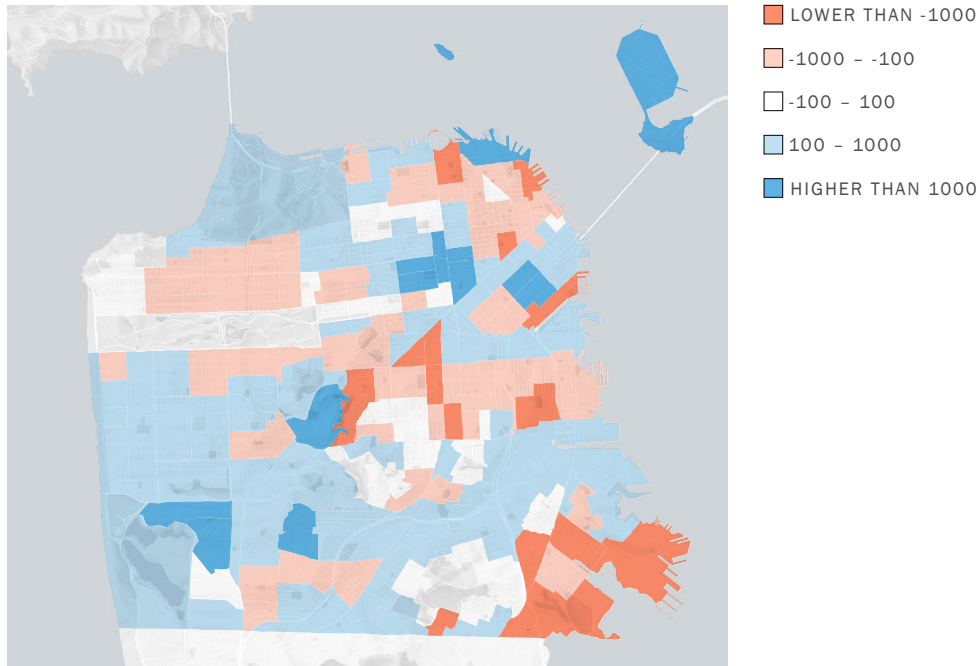
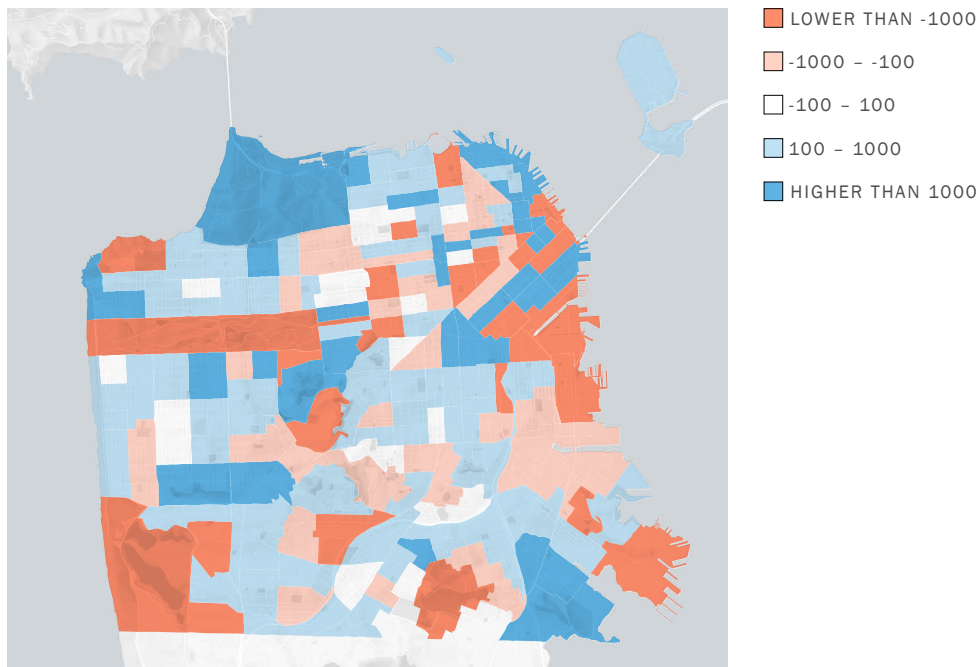


Figure A12-3. Difference in Jobs from Plan Bay Area 2050 (CHAMP net of MTC)



A12.2.3 PRICING ASSUMPTIONS (FORECAST)

Product 8: Table comparing the assumed automobile operating cost, key transit fares, and roadway/express lane and bridge tolls to MTC's values for the horizon year. For express lanes and roadway tolls, documentation comparing the tolled extents should be included.

Auto operating costs are assumed to be 25 cents per mile in 2015 dollars, which was based off of the lower auto operating cost per mile that MTC used prior to Travel Model One.

Table A12-5. Comparison of SF-CHAMP to MTC Pricing Assumptions

	MTC PRICING ASSUMPTIONS 2050 Value in 2000 dollars		SF-CHAMP PRICING ASSUMPTION 2050 Value in 2000 dollars		MTC PRICING ASSUMPTIONS 2050 Value in 2010 dollars		SF-CHAMP PRICING ASSUMPTION 2050 Value in 2010 dollars	
	Single Occupancy	Carpool	Single Occupancy	Carpool	Single Occupancy	Carpool	Single Occupancy	Carpool
Perceived Automobile Operating Cost (per mile)		\$0.17		\$0.17		\$0.22		\$0.22
Transit Fares								
Muni Local Bus		\$1.52		\$1.18		\$1.92		\$1.49
AC Transit Local Bus		\$1.35		\$1.51		\$1.70		\$1.91
VTA Local Bus		\$1.35		\$1.51		\$1.70		\$1.91
SamTrans Local Bus		\$1.35		\$1.51		\$1.70		\$1.91
Bridge Tolls								
San Francisco/Oakland Bay Bridge	\$4.83	\$2.15	\$4.28	\$1.83	\$6.09	\$2.71	\$5.40	\$2.31
Antioch Bridge	\$4.29	\$2.15	\$3.67	\$1.83	\$5.41	\$2.71	\$4.63	\$2.31
Benicia/Martinez Bridge	\$4.29	\$2.15	\$3.67	\$1.83	\$5.41	\$2.71	\$4.63	\$2.31
Carquinez Bridge	\$4.29	\$2.15	\$3.67	\$1.83	\$5.41	\$2.71	\$4.63	\$2.31
Dumbarton Bridge	\$4.29	\$2.15	\$3.67	\$1.83	\$5.41	\$2.71	\$4.63	\$2.31
Richmond/San Rafael Bridge	\$4.29	\$2.15	\$3.67	\$1.83	\$5.41	\$2.71	\$4.63	\$2.31
San Mateo Bridge	\$4.29	\$2.15	\$3.67	\$1.83	\$5.41	\$2.71	\$4.63	\$2.31
Golden Gate Bridge	\$4.70	\$3.62	\$5.01	\$3.27	\$5.92	\$4.56	\$6.32	\$4.13

	MTC PRICING ASSUMPTIONS		SF-CHAMP PRICING ASSUMPTION		MTC PRICING ASSUMPTIONS		SF-CHAMP PRICING ASSUMPTION	
	2050 Value in 2000 dollars		2050 Value in 2000 dollars		2050 Value in 2010 dollars		2050 Value in 2010 dollars	
Express Lane (Dynamic Tolling) Cost (per mile)								
Minimum	\$0.03	\$0.00	\$0.03	\$0.01	\$0.04	\$0.00	\$0.04	\$0.01
Maximum	\$0.91	\$0.41	\$1.43	\$1.43	\$1.15	\$0.52	\$1.80	\$1.80
Strategy T5: Per-Mile Roadway Toll Cost*	\$0.09	\$0.03	*	*	\$0.12	\$0.04	*	*
SR-37 Westbound Per-Mile Roadway Toll Cost	\$0.62	\$0.31	\$0.71	\$0.35	\$0.78	\$0.39	\$0.90	\$0.45

* Strategy T5 was not implemented in SF-CHAMP

A12.2.4 NETWORK ASSUMPTIONS (FORECAST)

Product 9: Statement establishing satisfaction of [network assumptions consistency].

The San Francisco Model uses network assumptions consistent with MTC's Plan Bay Area Consistency Guidance. The forecast baseline includes (1) projects that have already been built as of May 2022; (2) Muni bus and Metro service planned for summer 2022; (3) fully committed and developer committed transportation projects; (4) the SFTP "investment scenario".

A12.2.5 AUTO OWNERSHIP (FORECAST)

Product 10: County and superdistrict-level table comparing estimates of households by auto ownership level (zero, one, two, or more automobiles) to MTC's estimates for the horizon year.

The San Francisco auto ownership model is estimated based on CHTS 2010-2012 survey data and is a function of the mode choice and destination choice logsums as well as several household and person variables such as number of household drivers, full time and part time workers, students, income, age, presence of children, home zone parking cost, and land use characteristics of the home zone. Table A12-6, Table A12-7, Table A12-8, and Table A12-9 depict the county and superdistrict totals and shares, of 2050 SF-CHAMP auto ownership model results compared to the MTC model.

Table A12-6. Comparison of SF-CHAMP to ABAG Households by Number of Automobiles, by County, Forecast Year 2050, Plan Bay Area 2050

2050 TOTALS COUNTY	SF-CHAMP						PERCENT DIFFERENCE FROM MTC					
	0	1	2	3	4+	TOTAL	0	1	2	3	4+	TOTAL
San Francisco	200825	188038	147519	54444	13674	604500	-1.3%	-28.9%	43.1%	94.3%	74.9%	-0.4%
San Mateo	39850	121874	158606	66828	17863	405021	21.3%	-10.2%	8.3%	12.9%	-35.6%	0.8%
Santa Clara	144747	342638	398654	176000	49965	1112004	44.9%	-16.4%	6.2%	19.9%	-34.9%	0.3%
Alameda	144872	285436	295709	129697	35187	890901	-3.2%	-0.4%	5.4%	10.2%	-34.0%	0.4%
Contra Costa	41676	155777	229016	107094	30349	563912	46.3%	-5.5%	3.3%	3.6%	-26.6%	0.8%
Solano	11788	55209	78615	36230	11085	192927	50.4%	24.7%	14.0%	-6.3%	-44.8%	7.3%
Napa	2949	16094	26671	11618	3098	60430	-5.7%	-1.3%	16.7%	3.0%	-45.3%	2.0%
Sonoma	14588	69713	97395	40670	10179	232545	-8.1%	11.1%	10.2%	-5.1%	-48.8%	1.2%
Marin	9616	37414	73112	25638	5422	151202	23.6%	-19.2%	20.1%	2.0%	-42.5%	1.1%
Bay Area	610911	1272193	1505297	648219	176822	4213442	11.3%	-11.1%	10.0%	13.1%	-32.5%	0.7%

Table A12-7. Comparison of SF-CHAMP to ABAG Household Shares by Number of Automobiles, by County, Forecast Year 2050, Plan Bay Area 2050

2050 SHARES COUNTY	SF-CHAMP						DIFFERENCE FROM MTC					
	0	1	2	3	4+	TOTAL	0	1	2	3	4+	TOTAL
San Francisco	33%	31%	24%	9%	2%	100%	-0.3%	-12.5%	7.4%	4.4%	1.0%	0.0%
San Mateo	10%	30%	39%	16%	4%	100%	1.7%	-3.7%	2.7%	1.8%	-2.5%	0.0%
Santa Clara	13%	31%	36%	16%	4%	100%	4.0%	-6.2%	2.0%	2.6%	-2.4%	0.0%
Alameda	16%	32%	33%	15%	4%	100%	-0.6%	-0.2%	1.6%	1.3%	-2.1%	0.0%
Contra Costa	7%	28%	41%	19%	5%	100%	2.3%	-1.8%	1.0%	0.5%	-2.0%	0.0%
Solano	6%	29%	41%	19%	6%	100%	1.8%	4.0%	2.4%	-2.7%	-5.4%	0.0%
Napa	5%	27%	44%	19%	5%	100%	-0.4%	-0.9%	5.5%	0.2%	-4.4%	0.0%
Sonoma	6%	30%	42%	17%	4%	100%	-0.6%	2.7%	3.4%	-1.2%	-4.3%	0.0%
Marin	6%	25%	48%	17%	4%	100%	1.2%	-6.2%	7.6%	0.1%	-2.7%	0.0%
Bay Area	14%	30%	36%	15%	4%	100%	1.4%	-4.0%	3.0%	1.7%	-2.1%	0.0%

Table A12-8. Comparison of SF-CHAMP to ABAG Households by Number of Automobiles, by Superdistrict, Forecast Year 2050, Plan Bay Area 2050

2050 - TOTALS SUPERDISTRICT	SF-CHAMP						PERCENT DIFFERENCE FROM MTC					
	0	1	2	3	4+	TOTAL	0	1	2	3	4+	TOTAL
San Francisco County (Combined)	200825	188038	147519	54444	13674	604500	-1.3%	-28.9%	43.1%	94.3%	74.9%	-0.4%
North San Mateo County	16534	51298	64746	29205	8368	170151	3.7%	-7.0%	10.4%	12.9%	-37.8%	0.6%
Central San Mateo County	12511	38070	49865	19388	4877	124711	27.9%	-13.6%	8.3%	13.3%	-27.5%	0.8%
South San Mateo County	10805	32506	43995	18235	4618	110159	51.8%	-11.0%	5.2%	12.5%	-38.9%	0.9%
Northwest Santa Clara County	18754	37165	38173	14360	3124	111576	58.4%	-17.2%	-0.2%	12.2%	-35.6%	-1.0%
North Santa Clara County	49512	107866	112377	42100	9622	321477	43.9%	-31.2%	20.9%	66.5%	-20.1%	0.0%
West Santa Clara County	16330	52523	70091	28759	7113	174816	98.0%	-7.4%	0.1%	8.5%	-36.8%	1.2%
Central Santa Clara County	35339	63405	54944	22720	5928	182336	14.9%	-10.8%	7.5%	20.2%	-44.6%	-0.1%
East Santa Clara County	15761	46449	65815	40348	15915	184288	57.7%	3.6%	-2.4%	10.5%	-34.3%	0.7%
Central South Santa Clara County	6190	24947	38240	18070	5116	92563	88.9%	0.9%	0.6%	3.7%	-39.9%	0.6%
South Santa Clara County	2861	10283	19014	9643	3147	44948	111.9%	-4.8%	8.7%	3.1%	-39.9%	1.6%
East Alameda County	9689	38248	53385	25772	7227	134321	112.4%	-4.6%	-5.4%	12.1%	-18.0%	1.1%
South Alameda County	11075	41640	62177	30748	9740	155380	-6.6%	8.2%	1.1%	6.0%	-32.7%	0.0%
Central Alameda County	18465	49860	62430	28899	8703	168357	11.3%	6.2%	8.0%	-2.5%	-41.2%	1.6%
North Alameda County	67175	106749	84242	33020	7398	298584	-4.8%	-2.5%	9.8%	17.0%	-39.8%	0.5%
Northwest Alameda County	38468	48939	33475	11258	2119	134259	-16.5%	-5.0%	19.1%	44.1%	-27.4%	-1.6%
West Contra Costa County	11323	37943	47938	21643	6135	124982	-1.4%	-2.1%	7.0%	5.0%	-34.2%	0.0%
North Contra Costa County	13046	37596	54661	24708	7046	137057	119.1%	-14.1%	4.2%	5.7%	-28.3%	1.2%
Central Contra Costa County	8431	29658	36699	15038	3279	93105	34.1%	-11.0%	7.6%	9.0%	-17.7%	1.7%
South Contra Costa County	2137	15306	32462	15857	4833	70595	116.7%	-7.4%	-1.3%	8.6%	-4.7%	0.8%
East Contra Costa County	6739	35274	57256	29848	9056	138173	78.5%	8.8%	-0.3%	-3.6%	-31.2%	0.3%
South Solano County	3922	17001	24107	11180	3272	59482	8.0%	4.5%	10.2%	-0.2%	-42.0%	1.5%
North Solano County	7866	38208	54508	25050	7813	133445	86.9%	36.5%	15.8%	-8.8%	-45.9%	10.1%
South Napa County	2370	10876	17518	8065	2248	41077	11.3%	1.3%	10.6%	0.4%	-47.4%	0.1%
North Napa County	579	5218	9153	3553	850	19353	-42.0%	-6.1%	30.5%	9.3%	-38.9%	6.3%
South Sonoma County	5908	27572	37222	15499	3795	89996	2.0%	6.6%	10.1%	-5.4%	-48.5%	0.9%
Central Sonoma County	7506	30758	41794	17705	4539	102302	-13.2%	18.9%	10.0%	-4.9%	-49.9%	2.1%
North Sonoma County	1174	11383	18379	7466	1845	40247	-18.1%	3.4%	10.7%	-4.6%	-46.5%	-0.2%
North Marin County	1718	6909	15348	5373	1169	30517	25.2%	-16.2%	21.3%	-6.6%	-47.3%	0.9%
Central Marin County	5060	18270	32105	11296	2535	69266	38.3%	-17.3%	18.8%	0.8%	-42.9%	1.2%
South Marin County	2838	12235	25659	8969	1718	51419	3.2%	-23.4%	20.9%	9.8%	-37.9%	1.1%
Bay Area	610911	1272193	1505297	648219	176822	4213442	11.3%	-11.1%	10.0%	13.1%	-32.5%	0.7%

Table A12-9. Comparison of SF-CHAMP to ABAG Household Shares by Number of Automobiles, by Superdistrict, Forecast Year 2050, Plan Bay Area 2050

2050 - SHARES SUPERDISTRICT	SF-CHAMP						DIFFERENCE FROM MTC					
	0	1	2	3	4+	TOTAL	0	1	2	3	4+	TOTAL
San Francisco County (Combined)	34%	44%	17%	5%	1%	100%	-0.3%	-12.5%	7.4%	4.4%	1.0%	0.0%
North San Mateo County	9%	33%	35%	15%	8%	100%	0.3%	-2.5%	3.4%	1.9%	-3.0%	0.0%
Central San Mateo County	8%	36%	37%	14%	5%	100%	2.1%	-5.1%	2.8%	1.7%	-1.5%	0.0%
South San Mateo County	7%	33%	38%	15%	7%	100%	3.3%	-3.9%	1.6%	1.7%	-2.7%	0.0%
Northwest Santa Clara County	11%	40%	34%	11%	4%	100%	6.3%	-6.6%	0.3%	1.5%	-1.5%	0.0%
North Santa Clara County	11%	49%	29%	8%	4%	100%	4.7%	-15.2%	6.0%	5.2%	-0.8%	0.0%
West Santa Clara County	5%	33%	41%	15%	7%	100%	4.6%	-2.8%	-0.5%	1.1%	-2.4%	0.0%
Central Santa Clara County	17%	39%	28%	10%	6%	100%	2.5%	-4.2%	2.1%	2.1%	-2.6%	0.0%
East Santa Clara County	5%	24%	37%	20%	13%	100%	3.1%	0.7%	-1.1%	1.9%	-4.6%	0.0%
Central South Santa Clara County	4%	27%	41%	19%	9%	100%	3.1%	0.1%	0.0%	0.6%	-3.7%	0.0%
South Santa Clara County	3%	24%	40%	21%	12%	100%	3.3%	-1.5%	2.7%	0.3%	-4.8%	0.0%
East Alameda County	3%	30%	42%	17%	7%	100%	3.8%	-1.7%	-2.7%	1.9%	-1.3%	0.0%
South Alameda County	8%	25%	40%	19%	9%	100%	-0.5%	2.0%	0.4%	1.1%	-3.1%	0.0%
Central Alameda County	10%	28%	35%	18%	9%	100%	1.0%	1.3%	2.2%	-0.7%	-3.8%	0.0%
North Alameda County	24%	37%	26%	9%	4%	100%	-1.2%	-1.1%	2.4%	1.6%	-1.7%	0.0%
Northwest Alameda County	34%	38%	21%	6%	2%	100%	-5.1%	-1.3%	4.3%	2.7%	-0.6%	0.0%
West Contra Costa County	9%	31%	36%	16%	7%	100%	-0.1%	-0.6%	2.5%	0.8%	-2.6%	0.0%
North Contra Costa County	4%	32%	39%	17%	7%	100%	5.1%	-4.9%	1.1%	0.8%	-2.1%	0.0%
Central Contra Costa County	7%	36%	37%	15%	4%	100%	2.2%	-4.6%	2.1%	1.1%	-0.8%	0.0%
South Contra Costa County	1%	24%	47%	21%	7%	100%	1.6%	-1.9%	-0.9%	1.6%	-0.4%	0.0%
East Contra Costa County	3%	24%	42%	22%	10%	100%	2.1%	2.0%	-0.2%	-0.9%	-3.0%	0.0%
South Solano County	6%	28%	37%	19%	10%	100%	0.4%	0.8%	3.2%	-0.3%	-4.1%	0.0%
North Solano County	3%	23%	39%	23%	12%	100%	2.4%	5.5%	2.0%	-3.9%	-6.1%	0.0%
South Napa County	5%	26%	39%	20%	10%	100%	0.6%	0.3%	4.0%	0.1%	-4.9%	0.0%
North Napa County	5%	31%	39%	18%	8%	100%	-2.5%	-3.6%	8.8%	0.5%	-3.3%	0.0%
South Sonoma County	6%	29%	38%	18%	8%	100%	0.1%	1.7%	3.5%	-1.2%	-4.0%	0.0%
Central Sonoma County	9%	26%	38%	19%	9%	100%	-1.3%	4.2%	2.9%	-1.3%	-4.6%	0.0%
North Sonoma County	4%	27%	41%	19%	9%	100%	-0.6%	1.0%	4.5%	-0.9%	-4.0%	0.0%
North Marin County	5%	27%	42%	19%	7%	100%	1.1%	-4.6%	8.5%	-1.4%	-3.5%	0.0%
Central Marin County	5%	32%	39%	16%	6%	100%	2.0%	-5.9%	6.9%	-0.1%	-2.8%	0.0%
South Marin County	5%	31%	42%	16%	5%	100%	0.1%	-7.6%	8.2%	1.4%	-2.1%	0.0%
Bay Area	13%	34%	33%	14%	6%	100%	1.4%	-4.0%	3.0%	1.7%	-2.1%	0.0%

A12.2.6 COORDINATED DAILY ACTIVITY PATTERN / TRIP GENERATION

Product 11: Tables comparing estimates of trip frequency by purpose by superdistrict and county of residence to MTC’s estimates for the horizon year.

The following table compares trips by tour purpose between Travel Model 1.5 and SF-CHAMP. SF-CHAMP estimates a total number of trips 17% lower than Travel Model 1.5. For purposes with a difference in trip-share larger than 2%: SF-CHAMP estimates lower rates of shopping and other, and higher rates of work, escort, and social.

Table A12-10. Comparison of SF-CHAMP to MTC Number of Trip Frequency by Purpose, by County of Residence, Year 2050, Plan Bay Area 2050

2050 TOTALS COUNTY	SF-CHAMP									
	WORK	UNIVERSITY	SCHOOL	AT-WORK	EAT OUT	ESCORT	SHOPPING	SOCIAL	OTHER	ALL PURPOSES
San Francisco	1,517,910	104,290	196,143	234,014	184,683	530,203	366,308	531,941	398,158	4,063,650
San Mateo	1,038,010	46,888	214,441	186,641	143,045	408,353	289,880	450,300	326,500	3,104,058
Santa Clara	2,830,534	181,837	647,195	489,564	378,556	1,257,355	782,205	1,216,675	874,820	8,658,741
Alameda	2,145,319	156,904	470,260	372,859	294,601	905,904	595,009	928,167	675,657	6,544,680
Contra Costa	1,353,015	60,784	321,480	241,234	198,141	609,425	412,937	653,505	468,701	4,319,222
Solano	438,368	14,408	111,779	83,694	64,941	193,283	133,852	217,949	156,279	1,414,553
Napa	141,517	7,299	30,501	25,274	20,924	59,600	43,995	68,243	50,423	447,776
Sonoma	532,192	23,920	109,690	98,756	76,410	211,688	156,929	247,828	180,579	1,637,992
Marin	294,745	11,725	67,877	55,181	50,912	128,520	107,859	164,248	123,320	1,004,387
Bay Area	10,291,610	608,055	2,169,366	1,787,217	1,412,213	4,304,331	2,888,974	4,478,856	3,254,437	31,195,059

2050 - TOTALS COUNTY	PERCENT DIFFERENCE FROM MTC									
	WORK	UNIVERSITY	SCHOOL	AT-WORK	EAT OUT	ESCORT	SHOPPING	SOCIAL	OTHER	ALL PURPOSES
San Francisco	5%	-28%	-7%	-24%	-30%	157%	-46%	216%	-57%	-7%
San Mateo	1%	-8%	-28%	-20%	-30%	63%	-51%	211%	-63%	-16%
Santa Clara	0%	-30%	-28%	-19%	-34%	57%	-54%	181%	-65%	-18%
Alameda	8%	-39%	-27%	-14%	-32%	63%	-54%	178%	-64%	-16%
Contra Costa	1%	-19%	-35%	-24%	-31%	49%	-55%	198%	-65%	-20%
Solano	-6%	-42%	-34%	-22%	-28%	32%	-55%	196%	-64%	-22%
Napa	-7%	0%	-34%	-24%	-23%	52%	-51%	218%	-62%	-18%
Sonoma	-1%	-29%	-36%	-12%	-25%	46%	-54%	205%	-63%	-18%
Marin	-11%	-32%	-26%	-20%	-28%	49%	-53%	225%	-61%	-20%
Bay Area	2%	-30%	-28%	-20%	-31%	63%	-53%	193%	-63%	-17%

2050 - SHARES COUNTY	WORK	UNIVERSITY	SCHOOL	AT-WORK	SF-CHAMP EAT OUT	ESCORT	SHOPPING	SOCIAL	OTHER	ALL PURPOSES
San Francisco	4.9%	0.3%	0.6%	0.8%	0.6%	1.7%	1.2%	1.7%	1.3%	13.0%
San Mateo	3.3%	0.2%	0.7%	0.6%	0.5%	1.3%	0.9%	1.4%	1.0%	10.0%
Santa Clara	9.1%	0.6%	2.1%	1.6%	1.2%	4.0%	2.5%	3.9%	2.8%	27.8%
Alameda	6.9%	0.5%	1.5%	1.2%	0.9%	2.9%	1.9%	3.0%	2.2%	21.0%
Contra Costa	4.3%	0.2%	1.0%	0.8%	0.6%	2.0%	1.3%	2.1%	1.5%	13.8%
Solano	1.4%	0.0%	0.4%	0.3%	0.2%	0.6%	0.4%	0.7%	0.5%	4.5%
Napa	0.5%	0.0%	0.1%	0.1%	0.1%	0.2%	0.1%	0.2%	0.2%	1.4%
Sonoma	1.7%	0.1%	0.4%	0.3%	0.2%	0.7%	0.5%	0.8%	0.6%	5.3%
Marin	0.9%	0.0%	0.2%	0.2%	0.2%	0.4%	0.3%	0.5%	0.4%	3.2%
Bay Area	33.0%	1.9%	7.0%	5.7%	4.5%	13.8%	9.3%	14.4%	10.4%	100.0%

2050 - SHARES COUNTY	WORK	UNIVERSITY	SCHOOL	AT-WORK	DIFFERENCE FROM MTC EAT OUT	ESCORT	SHOPPING	SOCIAL	OTHER	ALL PURPOSES
San Francisco	1%	0%	0%	0%	0%	1%	-1%	1%	-1%	1%
San Mateo	1%	0%	0%	0%	0%	1%	-1%	1%	-1%	0%
Santa Clara	2%	0%	0%	0%	0%	2%	-2%	3%	-4%	-1%
Alameda	2%	0%	0%	0%	0%	1%	-2%	2%	-3%	0%
Contra Costa	1%	0%	0%	0%	0%	1%	-1%	2%	-2%	-1%
Solano	0%	0%	0%	0%	0%	0%	0%	1%	-1%	0%
Napa	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Sonoma	0%	0%	0%	0%	0%	0%	0%	1%	-1%	0%
Marin	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Bay Area	6%	0%	-1%	0%	-1%	7%	-7%	10%	-13%	0%

Table A12-11. Comparison of SF-CHAMP to MTC Number of Trips Frequency by Tour Purpose, by Superdistrict of Residence, Year 2050, Plan Bay Area 2050

2050 - TOTALS SUPERDISTRICT	SF-CHAMP									
	WORK	UNIVERSITY	SCHOOL	AT-WORK	EAT OUT	ESCORT	SHOPPING	SOCIAL	OTHER	ALL PURPOSES
San Francisco County (Combined)	1,517,910	104,290	196,143	234,014	184,683	530,203	366,308	531,941	398,158	4,063,650
North San Mateo County	464,094	24,196	91,083	82,100	61,894	180,712	123,837	190,475	139,769	1,358,160
Central San Mateo County	297,623	10,713	56,720	55,223	42,376	103,846	87,148	132,782	96,526	882,957
South San Mateo County	276,293	11,979	66,638	49,318	38,775	123,795	78,895	127,043	90,205	862,941
Northwest Santa Clara County	248,623	24,088	42,261	42,892	34,361	87,813	68,637	103,117	76,101	727,893
North Santa Clara County	820,453	38,315	147,325	141,500	96,768	317,259	193,750	307,876	217,974	2,281,220
West Santa Clara County	423,103	21,217	97,764	75,562	60,717	177,744	124,836	191,892	140,535	1,313,370
Central Santa Clara County	411,099	39,561	98,915	66,230	58,917	190,670	120,728	182,421	134,135	1,302,676
East Santa Clara County	563,567	38,991	160,902	96,285	78,604	316,083	169,708	264,399	187,902	1,876,441
Central South Santa Clara County	252,312	13,470	62,841	45,992	32,590	108,789	69,239	109,478	78,344	773,055
South Santa Clara County	111,377	6,195	37,187	21,103	16,599	58,997	35,307	57,492	39,829	384,086
East Alameda County	327,622	15,036	81,842	63,541	44,119	139,553	93,182	149,156	103,826	1,017,877
South Alameda County	453,995	18,859	99,992	83,751	57,398	186,594	113,195	189,239	131,685	1,334,708
Central Alameda County	417,249	21,505	95,910	73,885	62,009	185,027	125,066	196,539	144,614	1,321,804
North Alameda County	689,115	37,944	156,978	109,665	94,231	304,206	195,157	287,251	216,406	2,090,953
Northwest Alameda County	257,338	63,560	35,538	42,017	36,844	90,524	68,409	105,982	79,126	779,338
West Contra Costa County	313,347	17,978	73,851	54,379	45,459	139,169	91,115	143,413	104,557	983,268
North Contra Costa County	342,368	13,612	69,102	61,410	46,932	143,048	93,958	150,893	107,882	1,029,205
Central Contra Costa County	200,325	9,713	31,068	35,310	28,452	68,314	61,635	87,971	66,351	589,139
South Contra Costa County	192,078	5,983	39,872	35,231	23,418	73,496	50,456	81,279	56,730	558,543
East Contra Costa County	304,897	13,498	107,587	54,904	53,880	185,398	115,773	189,949	133,181	1,159,067
South Solano County	148,267	5,595	31,959	27,490	21,164	59,577	42,790	68,984	50,087	455,913
North Solano County	290,101	8,813	79,820	56,204	43,777	133,706	91,062	148,965	106,192	958,640
South Napa County	99,705	4,701	24,691	17,955	15,095	45,801	31,591	49,235	35,849	324,623
North Napa County	41,812	2,598	5,810	7,319	5,829	13,799	12,404	19,008	14,574	123,153
South Sonoma County	204,120	9,585	41,139	38,894	28,646	77,383	58,103	92,222	66,783	616,875
Central Sonoma County	242,557	11,877	50,165	44,531	34,249	99,092	70,738	109,618	80,744	743,571
North Sonoma County	85,515	2,458	18,386	15,331	13,515	35,213	28,088	45,988	33,052	277,546
North Marin County	48,925	1,500	15,653	9,084	11,229	27,296	23,991	35,633	27,398	200,709
Central Marin County	130,887	6,322	34,547	24,387	23,491	62,232	49,980	76,928	57,551	466,325
South Marin County	114,933	3,903	17,677	21,710	16,192	38,992	33,888	51,687	38,371	337,353
Bay Area	10,291,610	608,055	2,169,366	1,787,217	1,412,213	4,304,331	2,888,974	4,478,856	3,254,437	31,195,059

2050 - TOTALS SUPERDISTRICT	PERCENT DIFFERENCE FROM MTC									
	WORK	UNIVERSITY	SCHOOL	AT-WORK	EAT OUT	ESCORT	SHOPPING	SOCIAL	OTHER	ALL PURPOSES
San Francisco County (Combined)	5%	-28%	-7%	-24%	-30%	157%	-46%	216%	-57%	-7%
North San Mateo County	0%	-2%	-27%	-23%	-28%	79%	-50%	203%	-61%	-14%
Central San Mateo County	2%	-22%	-30%	-19%	-30%	47%	-52%	219%	-63%	-18%
South San Mateo County	4%	-8%	-28%	-16%	-31%	57%	-53%	214%	-65%	-16%
Northwest Santa Clara County	3%	-49%	-26%	-20%	-39%	44%	-56%	196%	-65%	-21%
North Santa Clara County	2%	-33%	-31%	-15%	-37%	56%	-53%	198%	-65%	-16%
West Santa Clara County	2%	-42%	-33%	-19%	-35%	44%	-56%	192%	-66%	-21%
Central Santa Clara County	-9%	-25%	-20%	-25%	-32%	72%	-51%	169%	-64%	-19%
East Santa Clara County	3%	-6%	-25%	-22%	-30%	75%	-53%	166%	-66%	-16%
Central South Santa Clara County	2%	-19%	-34%	-16%	-37%	39%	-55%	163%	-66%	-20%
South Santa Clara County	-3%	-21%	-33%	-13%	-30%	42%	-51%	187%	-65%	-19%
East Alameda County	-7%	7%	-37%	-22%	-40%	36%	-52%	189%	-64%	-21%
South Alameda County	18%	-38%	-35%	-9%	-34%	32%	-58%	161%	-68%	-19%
Central Alameda County	6%	-26%	-29%	-18%	-29%	57%	-55%	181%	-65%	-18%
North Alameda County	13%	-33%	-25%	-12%	-26%	95%	-51%	173%	-62%	-11%
Northwest Alameda County	1%	-51%	82%	-10%	-37%	134%	-53%	207%	-58%	-15%
West Contra Costa County	8%	-5%	-30%	-17%	-29%	64%	-55%	188%	-65%	-16%
North Contra Costa County	0%	-15%	-37%	-24%	-32%	58%	-55%	205%	-64%	-19%
Central Contra Costa County	7%	-6%	-34%	-24%	-32%	47%	-55%	182%	-66%	-20%
South Contra Costa County	10%	-20%	-43%	-20%	-37%	22%	-57%	189%	-67%	-22%
East Contra Costa County	-12%	-38%	-33%	-34%	-27%	47%	-53%	213%	-63%	-22%
South Solano County	5%	-32%	-37%	-18%	-27%	43%	-55%	206%	-63%	-18%
North Solano County	-10%	-46%	-33%	-23%	-28%	28%	-55%	191%	-65%	-24%
South Napa County	-12%	7%	-34%	-28%	-25%	49%	-51%	211%	-64%	-21%
North Napa County	9%	-10%	-36%	-9%	-15%	63%	-50%	236%	-56%	-10%
South Sonoma County	-5%	-48%	-33%	-14%	-26%	52%	-53%	208%	-62%	-19%
Central Sonoma County	1%	-2%	-36%	-11%	-26%	46%	-54%	196%	-64%	-18%
North Sonoma County	2%	-22%	-40%	-13%	-22%	36%	-54%	220%	-62%	-19%
North Marin County	-31%	-42%	-25%	-35%	-25%	48%	-49%	228%	-58%	-24%
Central Marin County	-16%	-28%	-21%	-24%	-28%	56%	-51%	232%	-61%	-20%
South Marin County	11%	-34%	-36%	-6%	-30%	39%	-56%	214%	-63%	-18%
Bay Area	2%	-30%	-28%	-20%	-31%	63%	-53%	193%	-63%	-17%

2050 - SHARES SUPERDISTRICT	SF-CHAMP									
	WORK	UNIVERSITY	SCHOOL	AT-WORK	EAT OUT	ESCORT	SHOPPING	SOCIAL	OTHER	ALL PURPOSES
San Francisco County (Combined)	4.9%	0.3%	0.6%	0.8%	0.6%	1.7%	1.2%	1.7%	1.3%	13.0%
North San Mateo County	1.5%	0.1%	0.3%	0.3%	0.2%	0.6%	0.4%	0.6%	0.4%	4.4%
Central San Mateo County	1.0%	0.0%	0.2%	0.2%	0.1%	0.3%	0.3%	0.4%	0.3%	2.8%
South San Mateo County	0.9%	0.0%	0.2%	0.2%	0.1%	0.4%	0.3%	0.4%	0.3%	2.8%
Northwest Santa Clara County	0.8%	0.1%	0.1%	0.1%	0.1%	0.3%	0.2%	0.3%	0.2%	2.3%
North Santa Clara County	2.6%	0.1%	0.5%	0.5%	0.3%	1.0%	0.6%	1.0%	0.7%	7.3%
West Santa Clara County	1.4%	0.1%	0.3%	0.2%	0.2%	0.6%	0.4%	0.6%	0.5%	4.2%
Central Santa Clara County	1.3%	0.1%	0.3%	0.2%	0.2%	0.6%	0.4%	0.6%	0.4%	4.2%
East Santa Clara County	1.8%	0.1%	0.5%	0.3%	0.3%	1.0%	0.5%	0.8%	0.6%	6.0%
Central South Santa Clara County	0.8%	0.0%	0.2%	0.1%	0.1%	0.3%	0.2%	0.4%	0.3%	2.5%
South Santa Clara County	0.4%	0.0%	0.1%	0.1%	0.1%	0.2%	0.1%	0.2%	0.1%	1.2%
East Alameda County	1.1%	0.0%	0.3%	0.2%	0.1%	0.4%	0.3%	0.5%	0.3%	3.3%
South Alameda County	1.5%	0.1%	0.3%	0.3%	0.2%	0.6%	0.4%	0.6%	0.4%	4.3%
Central Alameda County	1.3%	0.1%	0.3%	0.2%	0.2%	0.6%	0.4%	0.6%	0.5%	4.2%
North Alameda County	2.2%	0.1%	0.5%	0.4%	0.3%	1.0%	0.6%	0.9%	0.7%	6.7%
Northwest Alameda County	0.8%	0.2%	0.1%	0.1%	0.1%	0.3%	0.2%	0.3%	0.3%	2.5%
West Contra Costa County	1.0%	0.1%	0.2%	0.2%	0.1%	0.4%	0.3%	0.5%	0.3%	3.2%
North Contra Costa County	1.1%	0.0%	0.2%	0.2%	0.2%	0.5%	0.3%	0.5%	0.3%	3.3%
Central Contra Costa County	0.6%	0.0%	0.1%	0.1%	0.1%	0.2%	0.2%	0.3%	0.2%	1.9%
South Contra Costa County	0.6%	0.0%	0.1%	0.1%	0.1%	0.2%	0.2%	0.3%	0.2%	1.8%
East Contra Costa County	1.0%	0.0%	0.3%	0.2%	0.2%	0.6%	0.4%	0.6%	0.4%	3.7%
South Solano County	0.5%	0.0%	0.1%	0.1%	0.1%	0.2%	0.1%	0.2%	0.2%	1.5%
North Solano County	0.9%	0.0%	0.3%	0.2%	0.1%	0.4%	0.3%	0.5%	0.3%	3.1%
South Napa County	0.3%	0.0%	0.1%	0.1%	0.0%	0.1%	0.1%	0.2%	0.1%	1.0%
North Napa County	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.4%
South Sonoma County	0.7%	0.0%	0.1%	0.1%	0.1%	0.2%	0.2%	0.3%	0.2%	2.0%
Central Sonoma County	0.8%	0.0%	0.2%	0.1%	0.1%	0.3%	0.2%	0.4%	0.3%	2.4%
North Sonoma County	0.3%	0.0%	0.1%	0.0%	0.0%	0.1%	0.1%	0.1%	0.1%	0.9%
North Marin County	0.2%	0.0%	0.1%	0.0%	0.0%	0.1%	0.1%	0.1%	0.1%	0.6%
Central Marin County	0.4%	0.0%	0.1%	0.1%	0.1%	0.2%	0.2%	0.2%	0.2%	1.5%
South Marin County	0.4%	0.0%	0.1%	0.1%	0.1%	0.1%	0.1%	0.2%	0.1%	1.1%
Bay Area	33.0%	1.9%	7.0%	5.7%	4.5%	13.8%	9.3%	14.4%	10.4%	100.0%

2050 - SHARES SUPERDISTRICT	DIFFERENCE FROM MTC									
	WORK	UNIVERSITY	SCHOOL	AT-WORK	EAT OUT	ESCORT	SHOPPING	SOCIAL	OTHER	ALL PURPOSES
San Francisco County (Combined)	1%	0%	0%	0%	0%	1%	-1%	1%	-1%	1%
North San Mateo County	0%	0%	0%	0%	0%	0%	0%	0%	-1%	0%
Central San Mateo County	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
South San Mateo County	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Northwest Santa Clara County	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
North Santa Clara County	0%	0%	0%	0%	0%	0%	0%	1%	-1%	0%
West Santa Clara County	0%	0%	0%	0%	0%	0%	0%	0%	-1%	0%
Central Santa Clara County	0%	0%	0%	0%	0%	0%	0%	0%	-1%	0%
East Santa Clara County	0%	0%	0%	0%	0%	1%	0%	1%	-1%	0%
Central South Santa Clara County	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
South Santa Clara County	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
East Alameda County	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
South Alameda County	0%	0%	0%	0%	0%	0%	0%	0%	-1%	0%
Central Alameda County	0%	0%	0%	0%	0%	0%	0%	0%	-1%	0%
North Alameda County	1%	0%	0%	0%	0%	1%	0%	1%	-1%	0%
Northwest Alameda County	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
West Contra Costa County	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
North Contra Costa County	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Central Contra Costa County	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
South Contra Costa County	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
East Contra Costa County	0%	0%	0%	0%	0%	0%	0%	0%	-1%	0%
South Solano County	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
North Solano County	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
South Napa County	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
North Napa County	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
South Sonoma County	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Central Sonoma County	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
North Sonoma County	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
North Marin County	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Central Marin County	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
South Marin County	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Bay Area	6%	0%	-1%	0%	-1%	7%	-7%	10%	-13%	0%

A12.2.7 ACTIVITY / TRIP LOCATION

Product 12: Region-level tables comparing estimates of average trip distance frequency distribution by tour/trip purpose to MTC’s estimates for horizon year.

SF-CHAMP uses a primary destination choice model to identify the primary destinations of all tours, then an intermediate stop model to identify any stops along the way. Work, at-work, shopping, social, and other trip purposes have average trip distances between the two models within 6%. University, school, and escort trips are longer in SF-CHAMP than in Travel Model 1.5, whereas eat out trips are shorter.

Table A12-12. Comparison of SF-CHAMP to MTC Average Trip Distance by Tour Purpose, Year 2050, Plan Bay Area 2050

	MTC	SF-CHAMP	PERCENT DIFFERENCE
Work	9.62	9.80	2%
University	5.40	7.68	42%
School	2.86	3.87	35%
At-Work	3.37	3.36	0%
Eat Out	5.59	4.70	-16%
Escort	3.61	4.88	35%
Shopping	4.24	4.01	-5%
Social	5.39	5.54	3%
Other	4.95	5.26	6%
Total	5.89	6.02	2%

Product 13: County-to-county comparison of journey-to-work or home-based work flow estimates to MTC’s estimates for the horizon year.

The following table compares SF-CHAMP to Travel Model 1.5 commuter flow shares. County to county flow shares are within 1.5% for each county pair.

Comparison of SF-CHAMP to MTC Journey to Work, County-to-County Usual Workplace, Forecast Year 2050, Plan Bay Area 2050

Table A12-13. SF-CHAMP 2050 – Number of commuters

COUNTY OF RESIDENCE	COUNTY OF WORK									
	SAN FRANCISCO	SAN MATEO	SANTA CLARA	ALAMEDA	CONTRA COSTA	SOLANO	NAPA	SONOMA	MARIN	BAY AREA
SAN FRANCISCO	456,187	48,000	9,684	24,571	3,089	166	67	174	2,843	544,781
SAN MATEO	78,950	189,220	71,977	24,429	1,497	93	34	70	858	367,128
SANTA CLARA	8,119	48,642	913,406	51,009	1,525	74	23	7	96	1,022,901
ALAMEDA	81,927	42,185	90,658	509,577	35,114	1,650	617	198	2,248	764,174
CONTRA COSTA	37,827	8,284	12,554	120,857	277,732	17,362	4,848	682	4,710	484,856
SOLANO	5,548	1,057	909	12,434	26,316	92,018	15,469	1,665	2,929	158,345
NAPA	862	226	197	2,064	3,652	7,200	32,807	2,507	914	50,429
SONOMA	5,162	820	302	2,612	2,263	1,870	3,419	161,385	12,464	190,297
MARIN	30,809	3,879	1,038	8,639	6,270	1,305	948	3,602	47,916	104,406
BAY AREA	705,391	342,313	1,100,725	756,192	357,458	121,738	58,232	170,290	74,978	3,687,317

Table A12-14. SF-CHAMP 2050 – Share of total commuters

COUNTY OF RESIDENCE	COUNTY OF WORK									
	SAN FRANCISCO	SAN MATEO	SANTA CLARA	ALAMEDA	CONTRA COSTA	SOLANO	NAPA	SONOMA	MARIN	BAY AREA
SAN FRANCISCO	12.37%	1.30%	0.26%	0.67%	0.08%	0.00%	0.00%	0.00%	0.08%	14.77%
SAN MATEO	2.14%	5.13%	1.95%	0.66%	0.04%	0.00%	0.00%	0.00%	0.02%	9.96%
SANTA CLARA	0.22%	1.32%	24.77%	1.38%	0.04%	0.00%	0.00%	0.00%	0.00%	27.74%
ALAMEDA	2.22%	1.14%	2.46%	13.82%	0.95%	0.04%	0.02%	0.01%	0.06%	20.72%
CONTRA COSTA	1.03%	0.22%	0.34%	3.28%	7.53%	0.47%	0.13%	0.02%	0.13%	13.15%
SOLANO	0.15%	0.03%	0.02%	0.34%	0.71%	2.50%	0.42%	0.05%	0.08%	4.29%
NAPA	0.02%	0.01%	0.01%	0.06%	0.10%	0.20%	0.89%	0.07%	0.02%	1.37%
SONOMA	0.14%	0.02%	0.01%	0.07%	0.06%	0.05%	0.09%	4.38%	0.34%	5.16%
MARIN	0.84%	0.11%	0.03%	0.23%	0.17%	0.04%	0.03%	0.10%	1.30%	2.83%
BAY AREA	19.13%	9.28%	29.85%	20.51%	9.69%	3.30%	1.58%	4.62%	2.03%	100.00%

Table A12-15. Shares: Difference between SF-CHAMP and MTC

COUNTY OF RESIDENCE	COUNTY OF WORK									
	SAN FRANCISCO	SAN MATEO	SANTA CLARA	ALAMEDA	CONTRA COSTA	SOLANO	NAPA	SONOMA	MARIN	BAY AREA
SAN FRANCISCO	2.12%	-0.30%	-1.31%	-0.50%	-0.11%	-0.01%	0.00%	0.00%	-0.06%	-0.19%
SAN MATEO	-0.65%	0.29%	0.06%	0.08%	-0.02%	0.00%	0.00%	0.00%	-0.02%	-0.24%
SANTA CLARA	-0.49%	-0.24%	1.45%	-0.63%	0.00%	0.00%	0.00%	0.00%	0.00%	0.09%
ALAMEDA	-0.24%	0.29%	0.47%	0.68%	-0.29%	-0.04%	-0.01%	0.00%	0.00%	0.87%
CONTRA COSTA	-0.33%	-0.04%	-0.05%	0.03%	0.35%	0.06%	0.04%	0.01%	0.02%	0.09%
SOLANO	-0.03%	0.02%	0.02%	0.07%	0.08%	-0.46%	0.07%	0.01%	0.03%	-0.18%
NAPA	-0.02%	0.00%	0.01%	0.00%	-0.01%	-0.01%	0.00%	-0.04%	-0.01%	-0.08%
SONOMA	0.03%	0.01%	0.01%	0.03%	0.01%	0.00%	-0.05%	-0.01%	0.00%	0.03%
MARIN	-0.12%	0.02%	0.02%	-0.04%	-0.07%	-0.01%	0.00%	-0.02%	-0.17%	-0.39%
BAY AREA	0.26%	0.06%	0.68%	-0.28%	-0.05%	-0.46%	0.04%	-0.05%	-0.20%	0.00%

A12.2.8 TRAVEL MODE CHOICE

Product 14: County-level (by county of residence) tables comparing travel mode flow estimates by tour/trip purpose to MTC’s estimates for the horizon year. The table summaries should be stratified by transit, auto (split into drive alone, shared ride 2, shared ride 3+), walk, and bicycle.

The following table compares travel mode flow estimates by tour purpose and county of residence for SF-CHAMP and MTC Travel Model 1.5. For the region-level estimates, SF-CHAMP estimates higher overall auto mode shares, and lower transit, walk, bicycle, and taxi / ride-hailing mode shares. For the region-level estimates, mode shares are within 5 percentage points of Travel Model 1.5 (except that all auto modes, when summed up, exceed Travel Model 1.5 estimates by 7%).

Table A12-16. SF-CHAMP Travel Mode Flow Estimates by Tour Purpose and County of Residence, Forecast Year 2050, Plan Bay Area 2050

COUNTY OF RESIDENCE	TOUR PURPOSE	TRIP MODE							ALL MODES	
		DRIVE ALONE	SHARED RIDE 2	SHARED RIDE 3+	TAXI & RIDE-HAILING	ALL AUTO	TRANSIT	WALK		BICYCLE
San Francisco	Work	34.3%	7.3%	3.7%	10.6%	55.8%	31.2%	9.1%	3.9%	100.0%
	University	10.8%	6.0%	7.3%	7.8%	32.0%	49.8%	14.4%	3.8%	100.0%
	School	2.1%	19.7%	27.6%	2.7%	52.0%	22.0%	20.2%	5.8%	100.0%
	At-Work	15.6%	8.0%	3.8%	36.0%	63.3%	1.6%	33.3%	1.9%	100.0%
	Eat Out	11.4%	18.5%	10.1%	16.8%	56.7%	21.4%	19.7%	2.2%	100.0%
	Escort	21.9%	34.4%	23.6%	0.0%	79.9%	0.0%	19.0%	1.0%	100.0%
	Shopping	18.2%	13.2%	7.2%	5.2%	43.8%	17.7%	35.0%	3.6%	100.0%
	Social	18.5%	16.4%	10.4%	17.0%	62.3%	12.7%	21.3%	3.7%	100.0%
	Other	18.9%	12.3%	7.4%	15.3%	53.8%	18.8%	24.1%	3.2%	100.0%
	Total	23.4%	14.2%	9.4%	11.3%	58.2%	20.2%	18.3%	3.3%	100.0%
San Mateo	Work	65.1%	11.1%	5.8%	0.4%	82.4%	13.1%	2.6%	1.9%	100.0%
	University	41.0%	14.8%	19.2%	2.5%	77.5%	16.4%	3.3%	2.8%	100.0%
	School	3.8%	29.5%	39.4%	0.4%	73.1%	8.2%	14.0%	4.7%	100.0%
	At-Work	35.5%	11.6%	5.2%	25.3%	77.7%	0.4%	20.9%	1.0%	100.0%
	Eat Out	28.3%	35.5%	17.3%	1.7%	82.7%	3.3%	12.2%	1.8%	100.0%
	Escort	27.6%	35.4%	28.2%	0.0%	91.2%	0.0%	8.1%	0.6%	100.0%
	Shopping	40.3%	24.2%	12.3%	0.2%	77.0%	3.1%	17.2%	2.7%	100.0%
	Social	35.0%	28.8%	17.2%	1.9%	82.9%	2.5%	11.8%	2.8%	100.0%
	Other	41.8%	23.5%	13.2%	1.9%	80.3%	4.6%	12.6%	2.5%	100.0%
	Total	43.0%	21.9%	14.8%	2.3%	81.9%	6.5%	9.4%	2.2%	100.0%

COUNTY OF RESIDENCE	TOUR PURPOSE	TRIP MODE							ALL MODES	
		DRIVE ALONE	SHARED RIDE 2	SHARED RIDE 3+	TAXI & RIDE-HAILING	ALL AUTO	TRANSIT	WALK		BICYCLE
Santa Clara	Work	65.9%	12.5%	6.7%	1.1%	86.1%	8.6%	2.6%	2.6%	100.0%
	University	38.0%	14.3%	17.9%	3.2%	73.4%	15.3%	7.5%	3.9%	100.0%
	School	4.5%	30.4%	39.7%	0.5%	75.0%	8.3%	11.6%	5.0%	100.0%
	At-Work	42.0%	13.6%	5.7%	22.1%	83.4%	0.1%	15.5%	1.0%	100.0%
	Eat Out	26.0%	36.1%	17.8%	2.6%	82.6%	1.9%	13.6%	2.0%	100.0%
	Escort	26.0%	35.7%	30.1%	0.0%	91.8%	0.0%	7.5%	0.7%	100.0%
	Shopping	37.5%	24.9%	13.0%	0.3%	75.7%	2.2%	19.1%	3.0%	100.0%
	Social	32.6%	30.1%	18.2%	2.9%	83.8%	2.2%	10.9%	3.1%	100.0%
	Other	38.9%	24.3%	13.9%	2.8%	80.0%	2.9%	14.1%	2.9%	100.0%
	Total	41.8%	23.1%	16.1%	2.5%	83.7%	4.7%	9.1%	2.6%	100.0%
Alameda	Work	62.6%	10.8%	5.8%	0.7%	79.9%	14.7%	3.3%	2.1%	100.0%
	University	30.5%	11.0%	13.3%	3.0%	57.8%	25.1%	13.3%	3.8%	100.0%
	School	4.4%	28.2%	36.9%	0.5%	70.0%	9.6%	15.3%	5.1%	100.0%
	At-Work	36.9%	12.1%	5.4%	22.4%	76.8%	0.4%	21.7%	1.1%	100.0%
	Eat Out	25.8%	34.3%	16.4%	3.0%	79.6%	3.9%	14.5%	2.0%	100.0%
	Escort	25.4%	34.6%	28.5%	0.0%	88.5%	0.0%	10.8%	0.8%	100.0%
	Shopping	37.1%	23.4%	11.8%	0.3%	72.6%	4.3%	20.0%	3.1%	100.0%
	Social	32.0%	28.1%	17.0%	3.0%	80.0%	3.8%	13.0%	3.2%	100.0%
	Other	37.7%	22.6%	12.7%	2.9%	75.9%	5.6%	15.5%	2.9%	100.0%
	Total	40.1%	21.3%	14.7%	2.5%	78.6%	7.8%	11.1%	2.4%	100.0%
Contra Costa	Work	70.3%	11.4%	6.4%	0.3%	88.4%	7.5%	2.5%	1.6%	100.0%
	University	47.6%	14.2%	20.5%	2.2%	84.6%	9.2%	3.5%	2.7%	100.0%
	School	4.5%	30.0%	40.1%	0.3%	74.9%	6.0%	14.5%	4.6%	100.0%
	At-Work	38.9%	11.9%	5.3%	22.2%	78.3%	0.2%	20.6%	0.9%	100.0%
	Eat Out	29.8%	36.5%	17.2%	1.4%	84.9%	1.0%	12.5%	1.7%	100.0%
	Escort	27.6%	34.2%	28.2%	0.0%	90.0%	0.0%	9.3%	0.7%	100.0%
	Shopping	42.4%	24.4%	12.4%	0.2%	79.4%	1.0%	16.9%	2.7%	100.0%
	Social	36.5%	29.2%	17.5%	1.6%	84.8%	0.9%	11.4%	2.8%	100.0%
	Other	43.9%	23.9%	13.3%	1.7%	82.8%	1.6%	13.1%	2.5%	100.0%
	Total	44.8%	22.5%	15.6%	1.9%	84.8%	3.4%	9.7%	2.1%	100.0%
Solano	Work	73.4%	12.5%	7.2%	0.2%	93.3%	3.0%	2.4%	1.4%	100.0%
	University	53.2%	16.7%	23.2%	1.4%	94.5%	3.4%	0.9%	1.2%	100.0%
	School	5.2%	30.3%	40.1%	0.3%	76.0%	5.2%	15.1%	3.8%	100.0%
	At-Work	41.4%	11.9%	5.3%	19.8%	78.5%	0.1%	20.6%	0.8%	100.0%
	Eat Out	31.2%	35.9%	16.8%	1.3%	85.2%	0.4%	12.7%	1.6%	100.0%
	Escort	27.2%	34.4%	29.0%	0.0%	90.6%	0.0%	8.8%	0.6%	100.0%
	Shopping	44.3%	24.3%	12.1%	0.1%	80.9%	0.5%	16.1%	2.5%	100.0%
	Social	36.8%	28.9%	17.3%	1.5%	84.5%	0.4%	12.1%	3.0%	100.0%
	Other	44.6%	23.2%	12.9%	1.4%	82.1%	0.6%	14.5%	2.7%	100.0%
	Total	46.1%	22.8%	15.9%	1.7%	86.6%	1.6%	9.9%	1.9%	100.0%

COUNTY OF RESIDENCE	TOUR PURPOSE	TRIP MODE								ALL MODES
		DRIVE ALONE	SHARED RIDE 2	SHARED RIDE 3+	TAXI & RIDE-HAILING	ALL AUTO	TRANSIT	WALK	BICYCLE	
Napa	Work	73.9%	12.2%	6.7%	0.3%	93.1%	1.0%	3.8%	2.0%	100.0%
	University	51.4%	13.0%	15.6%	1.8%	81.8%	3.7%	11.3%	3.2%	100.0%
	School	5.3%	30.4%	38.4%	0.4%	74.5%	4.6%	16.3%	4.6%	100.0%
	At-Work	40.7%	11.3%	4.9%	19.7%	76.6%	0.1%	22.3%	0.9%	100.0%
	Eat Out	32.0%	34.4%	16.0%	1.2%	83.6%	0.1%	14.6%	1.7%	100.0%
	Escort	28.9%	34.2%	26.9%	0.0%	90.0%	0.0%	9.4%	0.6%	100.0%
	Shopping	45.8%	22.6%	11.1%	0.2%	79.7%	0.2%	17.9%	2.3%	100.0%
	Social	39.1%	27.5%	15.8%	1.3%	83.7%	0.1%	13.6%	2.5%	100.0%
	Other	46.3%	22.2%	11.7%	1.5%	81.7%	0.2%	15.9%	2.2%	100.0%
	Total	47.9%	21.9%	14.4%	1.7%	85.8%	0.8%	11.3%	2.1%	100.0%
Sonoma	Work	73.8%	12.3%	6.2%	0.4%	92.7%	1.6%	3.4%	2.3%	100.0%
	University	51.1%	15.1%	17.1%	2.3%	85.6%	5.8%	5.5%	3.0%	100.0%
	School	5.5%	30.0%	39.1%	0.4%	75.0%	5.3%	15.4%	4.4%	100.0%
	At-Work	40.1%	11.0%	4.8%	19.5%	75.4%	0.1%	23.5%	1.0%	100.0%
	Eat Out	32.5%	34.5%	14.6%	1.4%	83.1%	0.3%	14.9%	1.7%	100.0%
	Escort	28.4%	34.7%	26.6%	0.0%	89.8%	0.0%	9.6%	0.6%	100.0%
	Shopping	46.0%	22.6%	10.5%	0.1%	79.3%	0.4%	18.0%	2.4%	100.0%
	Social	40.0%	26.7%	14.9%	1.5%	83.1%	0.3%	13.7%	2.8%	100.0%
	Other	47.2%	21.8%	10.8%	1.5%	81.4%	0.6%	15.5%	2.5%	100.0%
	Total	48.4%	21.6%	13.7%	1.8%	85.5%	1.1%	11.1%	2.2%	100.0%
Marin	Work	69.7%	10.3%	5.0%	0.2%	85.3%	10.9%	2.6%	1.2%	100.0%
	University	49.3%	14.5%	18.3%	1.9%	84.1%	8.5%	4.8%	2.6%	100.0%
	School	3.8%	30.3%	39.7%	0.2%	74.0%	5.6%	16.6%	3.8%	100.0%
	At-Work	33.6%	10.4%	4.7%	26.3%	74.9%	0.5%	23.7%	1.0%	100.0%
	Eat Out	33.0%	34.7%	14.7%	1.0%	83.3%	1.3%	14.0%	1.4%	100.0%
	Escort	29.8%	35.2%	25.5%	0.0%	90.5%	0.0%	8.9%	0.6%	100.0%
	Shopping	46.7%	22.4%	10.1%	0.1%	79.2%	1.2%	17.6%	1.9%	100.0%
	Social	41.0%	27.4%	14.7%	1.2%	84.3%	0.9%	12.4%	2.3%	100.0%
	Other	47.5%	22.7%	11.1%	1.0%	82.3%	1.9%	13.8%	1.9%	100.0%
	Total	46.2%	21.8%	13.5%	1.9%	83.3%	4.3%	10.7%	1.7%	100.0%
Bay Area	40.4%	21.2%	14.5%	3.5%	79.5%	7.0%	11.1%	2.4%	100.0%	

Table A12-17. Difference between SF-CHAMP and MTC Travel Mode Flow Estimates by Tour Purpose and County of Residence, Forecast Year 2050, Plan Bay Area 2050

COUNTY OF RESIDENCE	TOUR PURPOSE	TRIP MODE							ALL MODES	
		DRIVE ALONE	SHARED RIDE 2	SHARED RIDE 3+	TAXI & RIDE-HAILING	ALL AUTO	TRANSIT	WALK		BICYCLE
San Francisco	Work	13.5%	1.8%	1.7%	7.4%	24.3%	-17.5%	-3.0%	-3.8%	0.0%
	University	8%	0%	6%	4%	18%	-3%	-12%	-2%	0%
	School	-5%	4%	6%	2%	8%	13%	-8%	-12%	0%
	At-Work	-1%	-3%	0%	33%	29%	-4%	-20%	-6%	0%
	Eat Out	0%	1%	3%	11%	15%	-4%	-4%	-6%	0%
	Escort	9%	17%	12%	-5%	33%	-15%	-11%	-7%	0%
	Shopping	-7%	-3%	0%	-1%	-12%	-2%	14%	-1%	0%
	Social	7%	1%	2%	11%	20%	-12%	-4%	-4%	0%
	Other	1%	-3%	-2%	8%	3%	-2%	2%	-4%	0%
	Total	5%	2%	3%	6%	17%	-9%	-3%	-4%	0%
San Mateo	Work	10%	1%	2%	-1%	12%	-6%	-1%	-5%	0%
	University	14%	-8%	16%	-7%	16%	-7%	-1%	-7%	0%
	School	-7%	6%	6%	-1%	5%	6%	-1%	-9%	0%
	At-Work	-2%	0%	0%	24%	22%	-1%	-16%	-5%	0%
	Eat Out	0%	14%	5%	-4%	14%	-4%	-5%	-6%	0%
	Escort	6%	6%	11%	-3%	19%	-3%	-11%	-6%	0%
	Shopping	-4%	3%	0%	-6%	-7%	0%	8%	-1%	0%
	Social	7%	8%	2%	-5%	11%	-4%	-3%	-4%	0%
	Other	8%	3%	-3%	-6%	1%	0%	2%	-3%	0%
	Total	5%	4%	2%	-2%	8%	-2%	-2%	-4%	0%
Santa Clara	Work	6%	2%	3%	-1%	10%	-3%	-1%	-6%	0%
	University	11%	-7%	14%	-5%	12%	-6%	-1%	-5%	0%
	School	-6%	4%	4%	-1%	2%	6%	-2%	-6%	0%
	At-Work	-3%	0%	0%	21%	18%	-1%	-11%	-6%	0%
	Eat Out	-4%	14%	4%	-4%	11%	-2%	-4%	-5%	0%
	Escort	4%	5%	12%	-4%	18%	-2%	-11%	-4%	0%
	Shopping	-6%	3%	-1%	-6%	-11%	-1%	11%	0%	0%
	Social	3%	9%	2%	-5%	8%	-1%	-4%	-3%	0%
	Other	5%	3%	-5%	-7%	-3%	0%	4%	-2%	0%
	Total	2%	4%	2%	-3%	6%	-1%	-1%	-4%	0%
Alameda	Work	10%	1%	2%	-1%	12%	-4%	-1%	-6%	0%
	University	12%	-5%	11%	-3%	14%	1%	-6%	-9%	0%
	School	-6%	3%	3%	0%	0%	6%	0%	-7%	0%
	At-Work	-2%	1%	0%	21%	20%	-1%	-13%	-6%	0%
	Eat Out	-1%	13%	4%	-3%	13%	-3%	-5%	-5%	0%
	Escort	3%	5%	11%	-3%	16%	-2%	-9%	-5%	0%
	Shopping	-4%	2%	-2%	-6%	-10%	-1%	10%	0%	0%
	Social	7%	8%	1%	-5%	11%	-2%	-5%	-3%	0%
	Other	6%	2%	-4%	-6%	-2%	1%	3%	-2%	0%
	Total	5%	3%	2%	-2%	7%	-1%	-2%	-4%	0%

COUNTY OF RESIDENCE	TOUR PURPOSE	TRIP MODE								ALL MODES
		DRIVE ALONE	SHARED RIDE 2	SHARED RIDE 3+	TAXI & RIDE-HAILING	ALL AUTO	TRANSIT	WALK	BICYCLE	
Contra Costa	Work	8%	1%	2%	0%	10%	-5%	0%	-4%	0%
	University	13%	-15%	16%	-5%	10%	-4%	0%	-6%	0%
	School	-7%	5%	6%	0%	3%	5%	2%	-10%	0%
	At-Work	-3%	0%	0%	21%	19%	-1%	-14%	-4%	0%
	Eat Out	0%	15%	4%	-4%	15%	-2%	-7%	-5%	0%
	Escort	6%	5%	11%	-3%	20%	-1%	-14%	-5%	0%
	Shopping	-2%	3%	-1%	-6%	-6%	0%	7%	0%	0%
	Social	8%	7%	2%	-5%	12%	-2%	-6%	-3%	0%
	Other	11%	3%	-4%	-6%	3%	0%	0%	-2%	0%
	Total	5%	3%	2%	-2%	8%	-1%	-3%	-4%	0%
Solano	Work	3%	1%	3%	0%	7%	-2%	0%	-5%	0%
	University	14%	-18%	17%	-4%	8%	-6%	0%	-2%	0%
	School	-6%	4%	5%	-1%	3%	5%	2%	-10%	0%
	At-Work	-7%	1%	0%	19%	12%	0%	-8%	-4%	0%
	Eat Out	4%	14%	4%	-4%	17%	-1%	-10%	-6%	0%
	Escort	6%	6%	12%	-3%	21%	0%	-16%	-5%	0%
	Shopping	1%	2%	-1%	-6%	-5%	0%	5%	0%	0%
	Social	10%	7%	1%	-7%	11%	0%	-7%	-4%	0%
	Other	14%	2%	-5%	-8%	3%	0%	-1%	-2%	0%
	Total	5%	3%	2%	-3%	7%	0%	-3%	-4%	0%
Napa	Work	3%	1%	3%	0%	7%	-3%	1%	-5%	0%
	University	14%	-19%	10%	-10%	-5%	0%	10%	-5%	0%
	School	-6%	3%	-1%	0%	-5%	4%	7%	-6%	0%
	At-Work	-9%	0%	0%	19%	10%	0%	-5%	-5%	0%
	Eat Out	-2%	14%	3%	-3%	12%	-1%	-5%	-6%	0%
	Escort	5%	3%	9%	-3%	14%	-1%	-9%	-4%	0%
	Shopping	-1%	0%	-2%	-5%	-7%	-1%	8%	0%	0%
	Social	7%	4%	2%	-4%	8%	-1%	-3%	-4%	0%
	Other	10%	1%	-4%	-8%	-1%	0%	4%	-2%	0%
	Total	3%	2%	1%	-3%	4%	-1%	1%	-4%	0%
Sonoma	Work	1%	2%	3%	-1%	4%	-1%	1%	-4%	0%
	University	16%	-9%	13%	-7%	13%	-2%	-6%	-4%	0%
	School	-6%	0%	-1%	0%	-7%	5%	8%	-6%	0%
	At-Work	-14%	-1%	0%	19%	3%	0%	2%	-5%	0%
	Eat Out	-3%	11%	3%	-3%	8%	-1%	-1%	-6%	0%
	Escort	3%	2%	8%	-3%	11%	-1%	-5%	-5%	0%
	Shopping	-3%	-1%	-1%	-5%	-10%	0%	10%	0%	0%
	Social	6%	3%	1%	-5%	4%	-1%	1%	-4%	0%
	Other	9%	-1%	-4%	-6%	-3%	0%	5%	-2%	0%
	Total	2%	1%	1%	-2%	2%	0%	2%	-3%	0%

COUNTY OF RESIDENCE	TOUR PURPOSE	TRIP MODE							ALL MODES	
		DRIVE ALONE	SHARED RIDE 2	SHARED RIDE 3+	TAXI & RIDE-HAILING	ALL AUTO	TRANSIT	WALK		BICYCLE
Marin	Work	9%	-1%	0%	0%	7%	-3%	0%	-4%	0%
	University	18%	-8%	14%	-5%	20%	-7%	-1%	-11%	0%
	School	-8%	6%	6%	-1%	4%	4%	4%	-12%	0%
	At-Work	-7%	-1%	-1%	25%	16%	-1%	-13%	-3%	0%
	Eat Out	2%	13%	2%	-4%	13%	-1%	-5%	-7%	0%
	Escort	8%	8%	8%	-2%	22%	-1%	-15%	-5%	0%
	Shopping	0%	1%	-2%	-4%	-5%	0%	6%	-1%	0%
	Social	10%	6%	0%	-5%	11%	-1%	-4%	-5%	0%
	Other	11%	0%	-4%	-5%	3%	0%	0%	-4%	0%
	Total	5%	3%	1%	-1%	7%	-1%	-2%	-4%	0%
Bay Area	4%	3%	2%	-1%	7%	-2%	-2%	-4%	0%	

A12.2.9 TRAFFIC AND TRANSIT ASSIGNMENT

Traffic and transit volumes in SF-CHAMP are assigned for each of five time periods. Vehicles are assigned to one of twelve user classes based on auto occupancy, vehicle type, and whether the vehicle will not pay a value-toll, will pay a value-toll, or has already paid a value toll.

Travel Model 1.5 and SF-CHAMP use different time periods definitions: Travel Model One uses four-hour peak periods for both the morning and afternoon, while SF-CHAMP uses three-hour peak periods. The tables presented below have adjusted SF-CHAMP estimated volumes to four-hour peak periods, with the conversion factors from derived PeMS volumes.

Product 15: Region-level, time-period-specific comparison of vehicle miles traveled (VMT) and vehicle hours traveled (VHT) estimates by facility type to MTC’s estimates for the horizon year.

Product 16: Region-level, time-period-specific comparison of estimated average speed on freeways and all other facilities, separately, to MTC’s estimates for the horizon year.

Table A12-18 and Table A12-19 show highway assignment results from SF-CHAMP compared with Travel Model 1.5. SF-CHAMP estimates lower peak period and early morning vehicle miles travelled (VMT), and higher midday and evening VMT. The total daily VMT is within 1% of Travel Model One.

Table A12-18. SF-CHAMP Region-Level VMT, VHT, and Average Speed by Facility Type and Time Period, Year 2050, Plan Bay Area 2050

	SF-CHAMP TIME PERIOD	FACILITY TYPE					ALL FACILITIES
		MANAGED FREEWAYS & FREEWAYS	EXPRESSWAYS	MAJOR ARTERIALS	COLLECTORS	OTHER	
VMT	Early AM (3 Hr)	4,124,681	583,366	844,699	283,485	288,398	6,124,628
	AM Peak (4 Hr)	24,928,227	3,943,123	8,264,165	2,654,585	2,252,186	42,042,285
	Midday (5 Hr)	31,863,767	5,038,390	10,878,406	3,514,999	3,186,018	54,481,580
	PM Peak (4 Hr)	27,320,018	4,403,248	9,545,165	3,048,662	2,605,022	46,922,114
	Evening (8 Hr)	21,881,306	3,406,171	6,235,950	2,005,821	2,033,732	35,562,981
	All Time Periods	110,000,000	17,374,298	35,768,384	11,507,553	10,365,356	185,000,000
VHT	Early AM (3 Hr)	71,425	10,978	44,399	17,192	12,423	156,417
	AM Peak (4 Hr)	679,161	107,117	500,321	186,543	127,840	1,600,981
	Midday (5 Hr)	706,734	123,409	638,257	232,161	176,212	1,876,772
	PM Peak (4 Hr)	708,655	119,482	580,609	212,586	150,911	1,772,244
	Evening (8 Hr)	421,226	72,057	342,326	124,894	98,275	1,058,777
	All Time Periods	2,587,201	433,042	2,105,913	773,375	565,661	6,465,192
Average Speed (miles per hour)	Early AM (3 Hr)	57.7	53.1	19.0	16.5	23.2	39.2
	AM Peak (4 Hr)	36.7	36.8	16.5	14.2	17.6	26.3
	Midday (5 Hr)	45.1	40.8	17.0	15.1	18.1	29.0
	PM Peak (4 Hr)	38.6	36.9	16.4	14.3	17.3	26.5
	Evening (8 Hr)	51.9	47.3	18.2	16.1	20.7	33.6
	All Time Periods	42.6	40.1	17.0	14.9	18.3	28.6

Table A12-19. Percentage Difference between SF-CHAMP and MTC Region-Level VMT, VHT, and Average Speed by Facility Type and Time Period, Year 2050, Plan Bay Area 2050

	SF-CHAMP TIME PERIOD	FACILITY TYPE					ALL FACILITIES
		MANAGED FREEWAYS & FREEWAYS	EXPRESSWAYS	MAJOR ARTERIALS	COLLECTORS	OTHER	
VMT	Early AM (3 Hr)	-2%	-27%	-55%	-46%	-52%	-24%
	AM Peak (4 Hr)	25%	3%	-39%	-37%	-55%	-10%
	Midday (5 Hr)	77%	25%	-29%	-21%	-50%	13%
	PM Peak (4 Hr)	37%	5%	-39%	-38%	-58%	-8%
	Evening (8 Hr)	60%	19%	-37%	-27%	-44%	8%
	All Time Periods	45%	10%	-37%	-32%	-53%	-1%
VHT	Early AM (3 Hr)	-7%	-31%	-30%	-14%	-59%	-24%
	AM Peak (4 Hr)	60%	13%	-9%	-10%	-52%	4%
	Midday (5 Hr)	110%	36%	9%	15%	-46%	22%
	PM Peak (4 Hr)	73%	10%	-13%	-16%	-54%	0%
	Evening (8 Hr)	68%	20%	2%	13%	-47%	13%
	All Time Periods	73%	17%	-4%	-3%	-50%	8%
Average Speed (miles per hour)	Early AM (3 Hr)	5%	10%	-37%	-36%	17%	1%
	AM Peak (4 Hr)	-22%	-9%	-33%	-30%	-6%	-13%
	Midday (5 Hr)	-16%	-8%	-35%	-31%	-7%	-7%
	PM Peak (4 Hr)	-21%	-5%	-31%	-26%	-9%	-8%
	Evening (8 Hr)	-5%	-1%	-38%	-35%	5%	-4%
	All Time Periods	-16%	-5%	-34%	-30%	-5%	-8%

Product 17: Region-level, time-period-specific comparison of estimated volumes on bridges and county-lines, separately, to MTC's estimates for the horizon year.

Table A12-20. Comparison of SF-CHAMP to MTC Forecasted Bridge and Screenline Volumes by Time Period, Forecast Year 2050, Plan Bay Area 2050

SF-CHAMP 2050 ROUTE NUMBER/ DIRECTION	LINK DESCRIPTION	TIMEPERIOD					ALL TIME PERIODS
		EARLY AM (3-6 AM)	AM PEAK (6-10 AM)	MIDDAY (10 AM-3 PM)	PM PEAK (3-7 PM)	EVENING (7 PM-3 AM)	
80 W	Bay Bridge (Alameda to San Francisco)	8,350	35,871	36,285	30,772	28,432	139,710
80 E	Bay Bridge (San Francisco to Alameda)	3,493	30,475	42,445	42,604	43,110	162,127
101 S	Golden Gate Bridge (Marin to San Francisco)	3,324	23,462	24,959	11,364	7,083	70,191
101 N	Golden Gate Bridge (San Francisco to Marin)	673	8,768	21,258	21,715	19,479	71,893
1 S	Route 1 (San Francisco to San Mateo)	1,392	10,348	13,906	11,312	9,658	46,615
1 N	Route 1 (San Mateo to San Francisco)	1,102	13,000	21,401	19,173	15,353	70,028
101 S	Route 101 (San Francisco to San Mateo)	4,017	23,614	34,855	29,228	28,203	119,918
101 N	Route 101 (San Mateo to San Francisco)	3,412	28,787	39,908	32,299	28,717	133,123
280 N	Route 280 (San Francisco to San Mateo)	1,304	13,913	24,440	21,567	17,647	78,870
280 S	Route 280 (San Mateo to San Francisco)	2,088	20,332	28,101	21,343	18,545	90,409

PERCENTAGE DIFFERENCE BETWEEN SF-CHAMP AND MTC 2050 ROUTE NUMBER/ DIRECTION	LINK DESCRIPTION	TIMEPERIOD					ALL TIME PERIODS
		EARLY AM (3-6 AM)	AM PEAK (6-10 AM)	MIDDAY (10 AM-3 PM)	PM PEAK (3-7 PM)	EVENING (7 PM-3 AM)	
80 W	Bay Bridge (Alameda to San Francisco)	23%	-3%	81%	36%	29%	29%
80 E	Bay Bridge (San Francisco to Alameda)	-32%	0%	104%	52%	28%	37%
101 S	Golden Gate Bridge (Marin to San Francisco)	1%	-7%	57%	-13%	-20%	6%
101 N	Golden Gate Bridge (San Francisco to Marin)	-66%	-31%	28%	-3%	-8%	-4%
1 S	Route 1 (San Francisco to San Mateo)	-64%	-60%	-30%	-54%	-51%	-50%
1 N	Route 1 (San Mateo to San Francisco)	-58%	-42%	3%	-21%	-15%	-21%
101 S	Route 101 (San Francisco to San Mateo)	-7%	-11%	90%	61%	84%	45%
101 N	Route 101 (San Mateo to San Francisco)	10%	36%	133%	52%	85%	70%
280 N	Route 280 (San Francisco to San Mateo)	45%	25%	209%	195%	404%	157%
280 S	Route 280 (San Mateo to San Francisco)	1988%	747%	430%	281%	462%	441%

Product 18: Region-level, time-period-specific comparison of estimated transit boardings by operator and technology, separately, to MTC’s estimates for the horizon year.

Table A12-21. SF-CHAMP Forecasted Transit Boardings by Operator and Technology, Forecast Year 2050, Plan Bay Area 2050

OPERATOR	TECHNOLOGY	TIMEPERIOD					ALL TIME PERIODS
		EARLY AM (3-6 AM)	AM PEAK (6-10 AM)	MIDDAY (10 AM-3 PM)	PM PEAK (3-7 PM)	EVENING (7 PM-3 AM)	
AC Transit	Bus	8,654	102,445	103,105	107,877	54,568	376,648
BART	Heavy Rail	12,353	166,650	130,106	171,931	55,303	536,343
Caltrain	Commuter Rail	0	45,788	29,440	46,744	19,207	141,179
Golden Gate Transit	Bus	510	10,861	6,551	9,397	3,147	30,467
	Ferry	0	3,073	2,749	3,786	1,361	10,969
SamTrans	Bus	422	24,785	24,107	23,458	8,645	81,416
SF Muni	Bus	9,832	189,743	209,602	220,823	111,359	741,358
	Light Rail	10,171	77,516	80,687	99,204	41,630	309,208
VTA	Bus	2,287	82,486	73,204	86,662	28,326	272,965
	Light Rail	0	49,282	36,542	52,271	16,777	154,873
Other	Bus	183	44,595	34,439	49,791	12,894	141,903
	Ferry	0	5,077	3,873	5,127	1,908	15,985
	Light Rail	*	*	*	*	*	*
	Commuter Rail	77	1,661	683	1,450	202	4,073
All	All	44,490	803,964	735,088	878,521	355,325	2,817,387

* There are no "Other" Operators operating Light Rail in the SF-CHAMP model.

Table A12-22. Percentage Difference between SF-CHAMP and MTC Forecasted Transit Boardings by Operator and Technology, Forecast Year 2050, Plan Bay Area 2050

OPERATOR	TECHNOLOGY	TIMEPERIOD					ALL TIME PERIODS
		EARLY AM (3-6 AM)	AM PEAK (6-10 AM)	MIDDAY (10 AM-3 PM)	PM PEAK (3-7 PM)	EVENING (7 PM-3 AM)	
AC Transit	Bus	37%	-26%	18%	-26%	-20%	-15%
BART	Heavy Rail	-69%	-45%	34%	-27%	-71%	-38%
Caltrain	Commuter Rail	-100%	-65%	1%	-56%	-73%	-60%
Golden Gate Transit	Bus	-57%	-40%	4%	-44%	-43%	-36%
	Ferry	-100%	-69%	20%	-51%	-64%	-55%
SamTrans	Bus	-84%	-53%	-8%	-57%	-56%	-48%
SF Muni	Bus	-45%	-35%	5%	-33%	-36%	-27%
	Light Rail	126%	-12%	34%	1%	-35%	-2%
VTA	Bus	-1%	-15%	26%	-16%	16%	-4%
	Light Rail	-100%	-46%	-28%	-44%	-69%	-48%
Other	Bus	-95%	-42%	27%	-31%	-37%	-29%
	Ferry	0%	-49%	142%	-28%	-57%	-31%
	Light Rail	*	*	*	*	*	*
	Commuter Rail	-96%	-94%	-87%	-94%	-98%	-94%
All	All	-28%	-23%	31%	-18%	-32%	-32%

* There are no "Other" Operators operating Light Rail in the SF-CHAMP model.