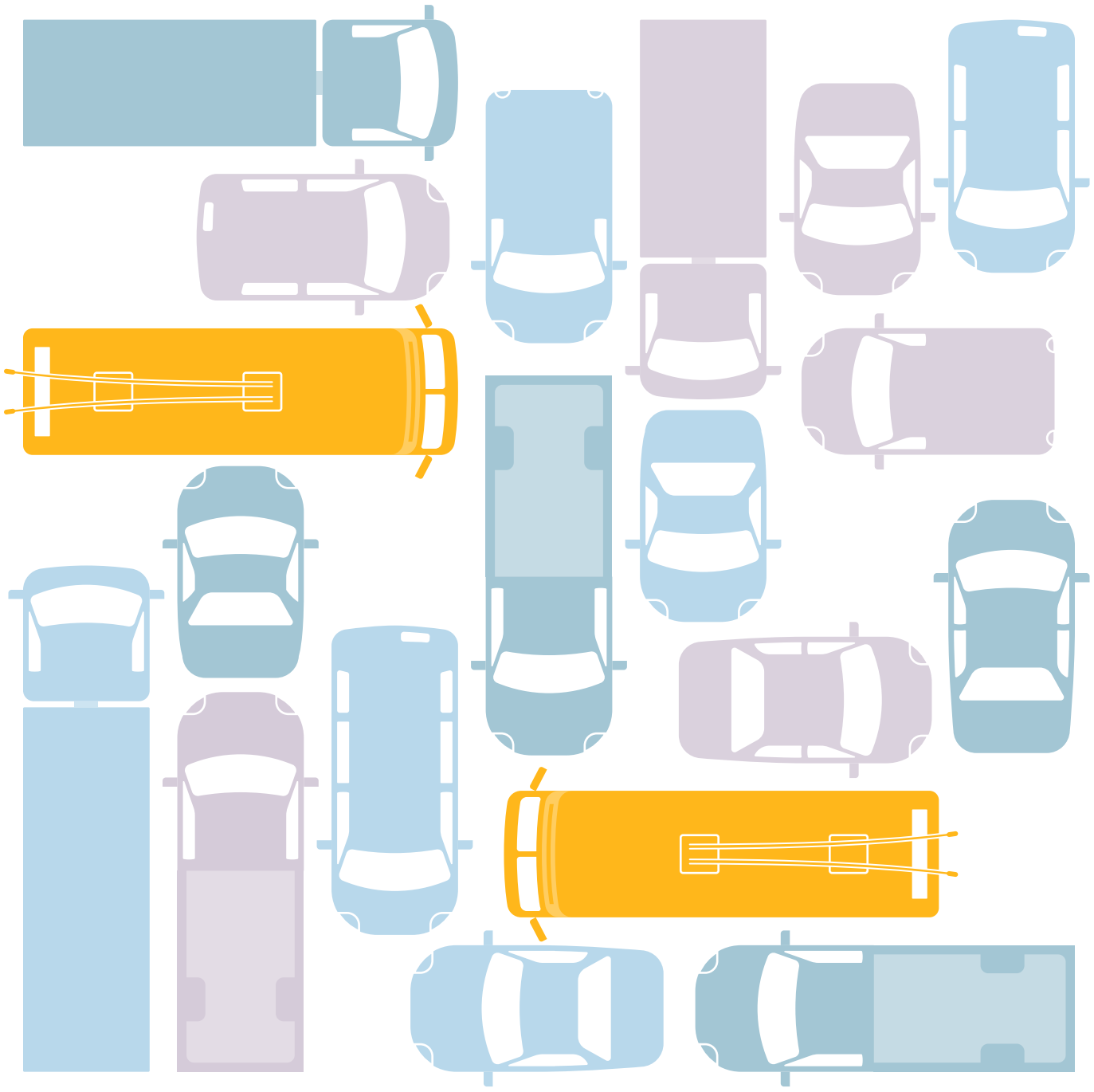


# Congestion Management Program **2021**

San Francisco
County Transportation
Authority

Final Report: December 2021

# Table of Contents

## TABLES



## FIGURES

CHAPTER 1

# Background and Program Overview

**KEY TOPICS**

- CMP Background
- Legislative Requirements
- Legislative Intent and Application to San Francisco
- Congestion Management in San Francisco

# 1.1 Background

## 1.1.1 PURPOSE OF THE CMP

As the Congestion Management Agency (CMA) for San Francisco, the San Francisco County Transportation Authority, (the Transportation Authority) is responsible for preparing a Congestion Management Program (CMP) update biennially. As mandated by state law, the purposes of the CMP are to:

- Define San Francisco's performance measures for congestion management;
- Report congestion monitoring data for San Francisco county to the public and the Metropolitan Transportation Commission (MTC);
- Describe San Francisco's congestion management strategies and efforts; and
- Outline the congestion management work program for fiscal years 2021/22 and 2022/23.

## 1.1.2 ORGANIZATION AND APPROACH

This document follows MTC's Guidance for Consistency of Congestion Management Programs with the Regional Transportation Plan, per MTC Resolution 3000, last revised June 2019.[1]

Each element required by the CMP legislation is discussed in a separate chapter. Each chapter describes the element's context in San Francisco, the work plan, and implementation guidance. The Transportation Authority Board will adopt any revisions developed during fiscal years 2021/22 and 2022/23 as amendments to the 2021 San Francisco CMP.

The 2021 CMP updates information from the 2019 CMP and reflects several important developments since 2019. The Transportation Authority prepared most of the 2021 CMP. Some performance monitoring data are collected and processed with help from consultant firms. In preparing the CMP update, the Transportation Authority has consulted with the San Francisco Municipal Transportation Agency (SFMTA) and other partner agencies to update policies and compile system performance data.

## 1.1.3 ORIGINS AND INTENT OF THE CMP LEGISLATION

CMP requirements were established in 1989 as part of a bipartisan state legislative package, known as the Katz-Kopp-Baker-Campbell Transportation Blueprint for the Twenty-First Century (AB 471). These requirements became effective when voters

1 For the complete text of MTC's guidance, please refer to Appendix 1.

approved Proposition 111 on June 5, 1990. AB 1963 (Katz) in September 1994 and AB 2419 (Bowler) in July 1996 further modified CMP law. The passage of AB 298 (Rainey), effective January 1, 1997, made the CMP exempt from the California Environmental Quality Act (CEQA). SB 1636 (Figueroa), passed in September 2002, amended CMP requirements to allow local jurisdictions to designate Infill Opportunity Zones (IOZs)[1].

For the complete text of the CMP legislation, see Appendix 2.

The 1989 state legislation directs the regional agency (MTC) to not program any surface transportation program funds and congestion mitigation and air quality funds for a project in a local jurisdiction that has been found to be in nonconformance with a congestion management program unless the project is found to be of regional significance. The goal of the legislation is to strengthen and coordinate local transportation funding and land use decisions by requiring preparation of long-range countywide transportation every four years, and monitoring of local transportation conditions every two years.

The CMP legislation aims to increase the productivity of existing transportation infrastructure and encourage more efficient use of scarce new dollars for transportation investments, in order to effectively manage congestion, improve air quality, and ultimately allow continued development. In order to achieve this, the CMP law is based on five mandates:

1. Require more coordination between federal, state, regional, and local agencies involved in the planning, programming, and delivery of transportation projects and services;
2. Favor transportation investments that provide measurable and quick congestion relief;
3. Link local land use decisions with their effect on the transportation system;
4. Favor multimodal transportation solutions that improve air quality; and
5. Emphasize local responsibility by requiring a Congestion Management Agency (CMA) in each urban county in the state.

## 1.2 Legislative Requirements

California Government Code section 65089 (a), as amended, states "A congestion management program shall be developed, adopted, and updated biennially, consistent with the schedule for adopting and updating the regional transportation

1 In December 2009, the San Francisco Board of Supervisors designated all then-eligible areas within the City and County of San Francisco as an IOZ. Please refer Appendix 3.

improvement program, for every county that includes an urbanized area, and shall include every city and the county. The program shall be adopted at a noticed public hearing of the agency. The program shall be developed in consultation with, and with the cooperation of, the transportation planning agency, regional transportation providers, local governments, the [California] department [of Transportation], and the air pollution control district or the air quality management district, either by the county transportation commission, or by another public agency, as designated by resolutions adopted by the county board of supervisors and the city councils of a majority of the cities representing a majority of the population in the incorporated area of the county."

For the complete text of the CMP statutes see Appendix 2.

## 1.3 Legislative Intent and Application to San Francisco

One of the main objectives of the CMP legislation is to foster coordination of local land use and transportation investment decisions at the county or subregional level. In order to ensure local involvement in this process the CMP law vests significant authority and responsibility in the Congestion Management Agencies (CMAs). CMAs therefore act as a policy forum and technical resource to guide and help coordinate local and regional congestion management efforts.

## 1.4 Congestion Management in San Francisco

### 1.4.1 APPLICABILITY OF THE CONCEPT

By statute, congestion management agencies must report on the roadway level of service (LOS) for its countywide network of regionally significant streets and highways (the Metropolitan Transportation System). However, San Francisco's 40-year Transit First policy places greater value on promoting walking, bicycling and taking transit, and correspondingly higher densities through transit-oriented and infill development. For this reason, the Transportation Authority began measuring transit performance, e.g. bus travel times and the ratio of bus to automobile travel times on the CMP network, in 2006. Moreover, by acting upon SB1636 in 2009 to designate San Francisco an infill opportunity zone and enable the county to identify alternative performance metrics to LOS, San Francisco indicated the desire to more formally move away from LOS and toward alternative measures of system performance that emphasized the movement of people and goods, not private vehicles. San Francisco's 3-part Transportation Sustainability Program (TSP) implemented this new approach. Among other things, the TSP involved replacing LOS with Vehicle Miles Traveled (VMT) as our city's local traffic impact measure under CEQA, following passage of SB743 in 2013. The reform was adopted by San Francisco Planning Commission in March 2016.

### 1.4.2 MANDATED PROGRAM COMPONENTS

The following statutory requirements of CMP legislation are mandated for all urban counties in the state:

1. A CMP updated biennially. The CMP must contain the following:
   - » A designated CMP roadway network
   - » A multimodal performance element that includes traffic level-of-service (LOS) standards and a methodology for monitoring LOS on the designated CMP roadway network, as well as transit service standards
   - » A travel demand element that promotes alternative transportation methods
   - » A land use impact analysis methodology
   - » A seven-year multimodal Capital Improvement Program (CIP);
2. A common database and method to analyze impacts of local land use decisions on the CMP network; and
3. A designated CMA for the county.

### 1.4.3 KEY CHANGES FROM THE 2019 CMP

The following sections highlight the most significant updates included in the 2021 CMP.

**Chapter 4:** This chapter presents the latest multimodal performance monitoring data along with updated long-term trends. This year's update includes two new metrics to measure auto reliability and transit service coverage.

**Chapter 5:** The Transportation Demand Management (TDM) Element has been updated to reflect recent changes to planning code requirements, advancements to San Francisco TDM strategies, including new policies requiring TDM measures.

**Chapter 7:** This chapter reflects amendments made to the CIP.

**Chapter 8:** The Transportation Authority's San Francisco Travel Demand Forecasting Model has undergone improvements since 2019, which are discussed in this chapter.

### 1.4.4 PUBLIC INPUT

The Draft 2021 San Francisco CMP is scheduled for public review at the December 1, 2021 meeting of the Transportation Authority's Citizens Advisory Committee. The Transportation Authority Board is also scheduled to consider approval of the 2021 CMP on December 7 and 14, 2021.

CHAPTER 2

# Congestion Management Agency Role & Responsibilities

**KEY TOPICS**

- San Francisco County Transportation Authority

# 2.1 The San Francisco County Transportation Authority

## 2.1.1 DESIGNATION AND COMPOSITION

On November 6, 1990, the Board of Supervisors designated the San Francisco County Transportation Authority (the Transportation Authority) as the CMA for the County. The Transportation Authority Board of Commissioners consists of the eleven members of the San Francisco Board of Supervisors, acting as Transportation Authority Commissioners.

## 2.1.2 ROLES AND RESPONSIBILITIES

The Transportation Authority is a special-purpose government agency, created on November 7, 1989, when San Francisco voters passed Proposition B. Proposition B increased the local sales tax by ½ cent for a period of 20 years, to fund San Francisco transportation projects and services. In November 2003, voters approved a new Expenditure Plan (Prop K), which superseded Prop B and extends the ½ cent sales tax for 30 years. The Transportation Authority administers, prioritizes, and programs Proposition K revenues. These revenues also leverage large amounts of State and Federal funds for transportation investments in San Francisco.

On November 2, 2010 San Francisco voters approved Proposition AA, authorizing collection of an additional $10 fee annually on motor vehicles registered in San Francisco and approving an Expenditure Plan for the new funds. The fee will fund local street repair, improvements to pedestrian and bicycle conditions, and public transit enhancements. As with Prop K, the Transportation Authority administers, prioritizes, and programs Prop AA funds.

In its capacity as the CMA for San Francisco, the Transportation Authority has primary responsibilities in the following areas:

- Develop and adopt the biennial CMP and related implementation guidance;
- Monitor City agencies' compliance with CMP requirements;
- Program Federal, State, and regional transportation funds;
- Review the programming of all transportation funds for San Francisco;
- Provide policy input into the regional transportation planning and programming process; and
- Develop and periodically update the long-range countywide transportation plan for San Francisco.

The Transportation Authority's dual responsibilities – administering the local half-cent transportation sales tax, and prioritizing and programming of State and Federal funds through the CMP process – are an opportunity to coordinate San Francisco's transportation planning decisions and optimize the City's investments in transportation infrastructure and services. Leveraging State and Federal funds through strategic use of Proposition K monies as well as local development impact fees are examples of the efficacy of this process. The San Francisco Transportation Plan improves the effectiveness of this process by linking transportation objectives and policies to a specific list of transportation investments, prioritized across a long-range planning horizon. The CMP's 7-year CIP and the Authority's Prop K Five-Year Prioritization Programs serve as the main implementation tools for the San Francisco Transportation Plan.

As the CMA, the Transportation Authority serves as the lead coordinator for San Francisco involvement in the regional process to develop a Sustainable Communities Strategy (SCS) and update the Regional Transportation Plan (RTP). Plan Bay Area 2050, which integrates the SCS and RTP into a single regional plan, was recently updated and adopted by MTC and ABAG in October 2021 As required by SB 375 (Steinberg), passed in 2008, Plan Bay Area integrates long-range land use, housing, and transportation planning in the region to reduce greenhouse gas emissions from motor vehicles.

In 2011, the Transportation Authority deepened our role in congestion management on Treasure Island. Assembly Bill No. 981, the Treasure Island Transportation Management Act, authorizes the Board of Supervisors (BOS) of the City and County of San Francisco to designate a board or agency to act as the transportation management agency (TMA) for Treasure Island and implement the Treasure Island Development Program's comprehensive and innovative transportation plan, which includes congestion pricing. In October 2011, the Transportation Authority Board recommended to the Board of Supervisors and the Treasure Island Development Authority (TIDA) that the Transportation Authority be designated as the Treasure Island Mobility Management Agency (TIMMA). Subsequent resolutions tasked the Transportation Authority with advancing agency formation documents, planning, and tolling.

In addition, acting as the CMA, the Transportation Authority plays a key role in reviewing and supporting transportation analyses for major local transportation projects and land use policies that may affect the performance of the transportation system.

The Transportation Authority takes a proactive role to serve as a resource in analyzing the potential transportation implications of transportation and land use related actions, projects, or policies proposed for the City. In order to fulfill this responsibility, the Transportation Authority regularly participates in and comments on studies and discussions of key San Francisco transportation and land use issues, such as the ConnectSF and its Transit Investment Strategy, Muni Forward, Better Market Street, the

BART/Capitol Corridor New Transbay Rail Crossing Study (Link21), and the Transportation Sustainability Program that involves the following three components:

1. **Invest:** Transportation Sustainability Fee – Invest in our transportation network by having developers pay their fair share to help offset the growth created by their project (signed into law November 2015).
2. **Align:** CEQA Reform – Replace LOS with VMT to analyze impacts of new development on transportation system, so it better aligns with the City's longstanding environmental policies, like reducing greenhouse gas emissions. This was adopted by the Planning Commission in March 2016, more than 2 years before statewide adoption in 2018.
3. **Shift:** Transportation Demand Management – Require new developments to provide on-site amenities that prioritize sustainable alternatives to driving (signed into law February 2017).

This approach allows the Board to anticipate potential problems, instead of reacting when congestion impacts reach crisis proportions and require hasty actions.

### 2.1.3 RELATIONSHIP TO CITY AGENCIES

State law mandates that the Transportation Authority, acting as CMA, biennially determine if the City is in conformance with the adopted Congestion Management Program. A finding of non-conformance has potentially significant consequences for transportation funding in the City. Also, according to state law, it is the City's responsibility to ensure that transportation projects, programs, and services are put in place, through its implementing departments, to maintain conformance with the CMP.

In fulfilling its CMA mandate, the Transportation Authority must function as an independent agency to be able to objectively and credibly evaluate CMP conformance. This dictates a special relationship with City departments involved in transportation-related actions which must be assessed at least biennially relative to their congestion management impacts. At the same time, the Transportation Authority's approach is to act as a resource, maximizing coordination with the City departments responsible for planning and implementation of transportation actions, so that such actions may be evaluated for congestion management impacts before they are put in place.

### 2.1.4 RELATIONSHIP TO REGIONAL PLANNING/PROGRAMMING AGENCIES

As the Congestion Management Agency for San Francisco, the Transportation Authority plays a key sub-regional planning and funding role with the Metropolitan Transportation Commission (MTC), the Bay Area's regional transportation planning agency, and with the Bay Area Air Quality Management District (BAAQMD), the agency responsible for implementation and monitoring of the region's Clean Air Plan. The

Transportation Authority coordinates local input into MTC's Regional Transportation Plan (RTP) through the development of the San Francisco Transportation Plan, which establishes the overall vision and priorities for long-range transportation development and funding for San Francisco, and through San Francisco's portion of the Regional Transportation Improvement Program (RTIP). In these ways, San Francisco influences the debate over the vision and goals for transportation and land use planning in the Bay Area, bringing to bear San Francisco's unique perspective on multimodal transportation, mobility, and livable communities.

CHAPTER 3

# CMP-Designated Roadway Network

**KEY TOPICS**

- Legislative Requirements
- San Francisco CMP Roadways
- Work Program Items

# 3.1 Legislative Requirements

California Government Code Section 65089(b)(1)(A) requires that performance standards be established for a system of highways and roadways designated by the agency, and that this designated Congestion Management Network include at least all state highways and principal arterials. No highway or roadway designated as part of the system may be removed from the system. The statutes do not define 'principal arterial.'

The statutes also refer to regional transportation systems as part of the required land use impacts analysis program, California Government Code Section 65089(b)(4). In 1991, the Bay Area's Congestion Management Agencies (CMAs) developed Congestion Management Program (CMP) networks in coordination with MTC's Metropolitan Transportation System (MTS). The MTS network, which includes both highways and transit services, was subsequently designated as the Congestion Management System, as required by the federal Intermodal Surface Transportation Efficiency Act (ISTEA) of 1991. The MTC contracted with the congestion management agencies in the Bay Area to help develop the MTS and to use the CMPs to link land use decisions to the MTS.

# 3.2 San Francisco CMP Roadways

CMP legislation requires that all state highways (including freeways) and principal arterials are included in the CMP network. The network must be useful to track the transportation impacts of land development decisions, as well as to assess the congestion management implications of proposed transportation projects. San Francisco's network therefore includes numerous local thoroughfares since most urban traffic occurs on city arterials (rather than on the freeways). The next sections document the network selection criteria and process used in the initial San Francisco CMP in 1991, and describes the current network.

## 3.2.1 SELECTION CRITERIA

Consistent with State requirements, the San Francisco CMP roadway network includes all freeways and state highways, as well as principal arterials. San Francisco has defined principal arterials as the Major Arterials designated in the Transportation Element of the City's General Plan, defined as follows:

> "cross-town thoroughfares whose primary function is to link districts within the city and to distribute traffic from and to the freeways; these are routes generally of citywide significance; of varying capacity depending on the travel demand for the specific direction and adjacent land uses."

Several additional arterials – Market Street, Mission Street, Sutter Street, and West Portal – are also included in the CMP roadway network. These streets experience significant conflicts between auto traffic and transit service.

### 3.2.2 SEGMENTATION METHOD

The 1993 CMP documented the criteria used in 1991 to segment the CMP roadway network in San Francisco, including freeway facilities (see Appendix 3). The following five criteria determined segment limits for the city arterials in the CMP: predominant development patterns (e.g., number of driveways, institutional uses); changes in speed limits; major cross streets; significant changes in traffic volumes; and freeway ramps. These criteria are generally recognized as significant in explaining the operating profile of a roadway.

For freeway facilities the segmentation criteria are simpler. They include major interchange on and off ramps, and points were two freeway facilities merge or bifurcate.

### 3.2.3 CURRENT NETWORK

The complete CMP roadway network for San Francisco consists of 233 directional miles on both arterials and freeways.

**Table 3-1.** 2021 Monitored Segment Miles

| ROADWAY TYPE | TOTAL DIRECTIONAL MILES |
|---|---|
| Arterial | 198.4 |
| Freeway | 34.9 |
| **TOTAL** | **233.3** |

Performance monitoring was conducted in 2021 for the entire CMP network.

A complete list and description of all arterial and freeway segments in the CMP network can be found in Appendix 3.

### 3.2.4 NETWORK CHANGES

State law prohibits the removal of roadway facilities from the initially designated CMP network (unless facilities are physically removed from the transportation system, such as the Embarcadero Freeway). New facilities may be added to the CMP network without restrictions, subject to the established criteria for inclusion. No network segmentation changes were made in the 2021 CMP. Appendix 3 lists all CMP arterials where segmentation changes have been made since 1991, including a technical justification.

From time to time the Transportation Authority may also monitor additional segments that are not part of the official CMP network. These do not constitute official changes to the CMP network, but may be included to support current planning and system management efforts. The Transportation Authority has not monitored any additional segments in 2021.

**Figure 3-1.** Spring 2021 Monitored Segments


### 3.2.5 RELATIONSHIP TO THE MTS

San Francisco's CMP roadway network is broadly consistent with the Metropolitan Transportation System (MTS) defined by MTC. The MTS is a regional network of roadways, transit corridors and transfer points. The State highways and major thoroughfares designated in San Francisco's CMP roadway network are all included in the San Francisco portion of the regional MTS network. In a few instances, the local CMP roadway network is not identical to the regional MTS network due to differences

in the criteria used to define each network. San Francisco's CMP and MTS networks are coordinated with the networks of adjacent counties, to ensure regional connectivity.

A 1993 agreement delegated responsibility from MTC to the Transportation Authority to implement certain mandates in the federal Interstate Surface Transportation and Efficiency Act (ISTEA) of 1991 and by extension, under the Safe, Accountable, Flexible, Efficient Transportation Equity Act—A legacy for Users (SAFETEA-LU) of 2005. These include the analysis of potential impacts on the MTS of proposed local land use decisions (see Chapter 6).

### 3.2.6 NON-AUTOMOBILE NETWORKS

Transportation performance measures in the San Francisco CMP have broadened to increasingly incorporate multimodal performance. However, the city's dense grid allows parallel streets in the same corridor to serve different transportation functions, and the designated CMP roadway network does not necessarily align with the most important or heavily traveled routes for transit riders, bicyclists, or pedestrians. Therefore, many of the non-auto performance measures in this CMP include data from non-CMP portions of the street network or use citywide metrics. Some multimodal measures, such as transit speed, use data collected along CMP network segments to facilitate comparisons with automobile performance. Chapter 4 provides details on multimodal performance.

## 3.3 Work Program Items

Participate in any future MTC efforts to redefine the Metropolitan Transportation System (MTS).

CHAPTER 4

# Multimodal Performance

**KEY TOPICS**

- Legislative Requirements
- Legislative Intent and Application to San Francisco
- Applications of Multimodal Performance Measures
- Legislatively Required Performance Measures (Auto LOS and Transit)
- Local Performance Measures (Transit, Bicycle, and Pedestrians)
- Work Program Items

This chapter presents the 2021 CMP multimodal performance results, including analyses of traffic congestion, transit, and non-motorized performance measures. It combines the traffic Level of Service (LOS) and multimodal performance elements required under state CMP legislation, reflecting the legislation's requirement that LOS be included as one of several multimodal performance measures. This approach is also consistent with San Francisco's urban, multimodal environment. Vehicular traffic congestion remains an important metric of transportation performance in San Francisco, but the City and County's Transit First policy and emphasis on person mobility place higher priority on the performance of alternative modes including transit, bicycles, and pedestrians than on private vehicle speeds.

# 4.1 Legislative Requirements

## 4.1.1 LOS MONITORING

The California Government Code requires that San Francisco use automobile LOS standards to measure the performance of the CMP roadway network, but permits CMAs a choice among the following methodologies for measuring LOS:

- Transportation Research Board Circular 212 (TRC 212);
- Transportation Research Board's Special Report 209: Highway Capacity Manual (HCM); or
- A uniform methodology adopted by the CMA that is consistent with the Highway Capacity Manual

The CMA is required to biennially determine the City's conformance with the CMP, including attainment of LOS standards.

In accordance with CMP legislation, the county and city governments are required to show that CMP route segments within their jurisdiction are operating at or above the CMP traffic LOS standard for all segments outside of any designated Infill Opportunity Zone (IOZ). Section 65089(b)(1)(B) states that "In no case shall the LOS standards established be below the LOS E or the current level, whichever is farthest from LOS A except when the area is in an infill opportunity zone. When the level of service on a segment or at an intersection fails to attain the established level of service standard outside an infill opportunity zone, a deficiency plan shall be adopted pursuant to section 65089.4". CMP route segments located within an IOZ are exempt from the minimum LOS standards and deficiency plan requirements mandated elsewhere by the CMP legislation.

Senate Bill 1636 (Figueroa), passed in 2002, authorized local jurisdictions to designate IOZs. IOZs must meet eligibility criteria to ensure they are compact, mixed-use

areas that are well-served by transit. In December 2009, the San Francisco Board of Supervisors designated all then-eligible areas within the City and County of San Francisco as an IOZ (Appendix 4). Descriptions of further changes to the definition of IOZs, and a map of San Francisco IOZs can be found in Chapter 6.

### 4.1.2 MULTIMODAL PERFORMANCE MONITORING

The CMP legislation also requires a multimodal performance element. AB 1963 in 1994 requires that the CMP shall include "[a] performance element that includes performance measures to evaluate current and future multimodal system performance for the movement of people and goods," and identifies performance measure requirements.

## 4.2 Legislative Intent and Application to San Francisco

The original CMP legislation defined performance narrowly as roadway LOS. The amendments to the CMP legislation acknowledged the need for diversified solutions to complex transportation problems in urban areas, and the inadvisability of tackling them with just one mode. Current performance element requirements recognize that the transportation system performance should be measured for all modes: automobile, transit, bicycle, and pedestrian.

According to the CMP legislation, deficiencies are identified only on the roadway system. Improvements on the LOS scale ensure better travel conditions for motorists, but the LOS scale does not take into account the person throughput capacity of a roadway. A city arterial may carry the maximum number of automobiles at acceptable speed, but if each vehicle carries only the driver, then throughput of the facility is suboptimal. San Francisco therefore includes performance standards and measurements that evaluate more aspects of the City's multimodal transportation network. San Francisco's high transit, pedestrian, and bicycle mode shares and extensive non-auto mode networks mean that the city benefits from a multimodal approach to system performance.

Consistent with State law, the 2021 San Francisco CMP distinguishes between two categories of performance measures. Legislatively required measures include roadway LOS plus three transit service performance measures: routing, frequency, and inter-operator service coordination. These are the elements of congestion and multimodal performance measurement that are explicitly required by State congestion management statutes. During this update two new metrics have been introduced, one each for roadway and transit performance. The new roadway performance measure called the Buffer Time Index (BTI) indicates roadway speed

reliability. The new measure for transit performance tracks the proportion of population and jobs that are within a 5-minute walk to a given frequency of transit service. Section 4.4 provides details on all these metrics.

Local performance measures include multimodal metrics that are not used for determination of CMP conformance under State legislation but reflect performance goals for alternative modes in the City of San Francisco. The local measures are used for planning purposes and to track trends over time. Transit measures included in the 2021 CMP include transit speeds, transit-to-auto speed ratios, and transit speed variability (reliability). In addition to these, we also include the service standards and milestones reported by the SFMTA and other transit providers, which include measures of transit crowding, transit on-time performance, and bunches and gaps in transit service. Non-motorized metrics include multi-modal volumes, bicycle network completeness, and pedestrian and bicyclist injuries and fatalities. These measures are discussed in further detail in Section 4.5.

## 4.3 Applications of Multimodal Performance Measures

State law requires that link (roadway) LOS be used for determining CMP conformance and conducting deficiency planning, except within a designated Infill Opportunity Zone. Multimodal performance measures will be used for the following purposes:

- CMP conformance determinations
- CIP amendments
- Deficiency plans
- Land use impacts analysis

## 4.4 Legislatively Required Performance Measures

### 4.4.1 ROADWAY LEVEL OF SERVICE (LOS) AND RELIABILITY

The CMP legislation defines roadway performance primarily by using the LOS traffic engineering concept to evaluate the operating conditions on a roadway. LOS describes operating conditions on a scale of A to F, with "A" describing free flow, and "F" describing bumper-to-bumper conditions. The CMP-mandated traffic LOS standard for San Francisco was established at E in the initial (1991) CMP network. 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. In addition,

because much of San Francisco are an Infill Opportunity Zones, most CMP segments in San Francisco are exempt from minimum LOS standards. However, continued monitoring of automobile LOS is useful for a variety of reasons. As the most extensive historical dataset available, LOS allows for the monitoring of traffic conditions over a long period of time. In addition to LOS, travel time reliability is an important measure of roadway congestion. With travelers experiencing a broad range of conditions from day to day, it is not sufficient to understand congestion just in terms of "average" or "typical" conditions (as measured by LOS). A new metric for measuring roadway reliability is introduced in this CMP update called the Buffer Time Index (BTI). This is calculated as the percent of average additional travel time that the travelers need to budget so that they have a 95% chance of arriving on time. In other words, it is the extra time need if one does not want to be late more than once a month.

Congestion is also an important factor in the performance of surface-running transit service: where transit operates in mixed traffic, increased congestion will slow transit. Finally, ongoing monitoring of both automobile and transit speeds within the same corridor facilitates the assessment of relative modal performance.

## Monitoring Approach

The Transportation Authority uses INRIX data, a commercial dataset which combines several real-time GPS monitoring sources with data from highway performance monitoring systems, as the primary source for official speed and LOS calculations. INRIX data is supplemented with floating car data where INRIX data is not available. This method was adopted in the 2013 CMP after an initial study conducted as part of the 2011 CMP found that results calculated from INRIX were appropriate for use in speed and LOS calculations. The INRIX and floating car data were collected in April and May 2021, which is the typical CMP monitoring period for San Francisco. The Buffer Time Index (BTI) for travel time reliability was calculated for CMP segments for which INRIX data were available which was 99% of all segments. This is because BTI calculation involves deriving the distribution of speeds and travel times during the monitoring period and determining the 95th percentile values. This distribution cannot be calculated for the limited subset of segments for which floating car runs were performed. The methodology and results of the 2021 LOS Monitoring effort are detailed in Appendix 5.

## Summary of 2021 LOS Monitoring Results

Table 4-1, below, presents the change in CMP network average travel speeds (calculated as time-mean speed) and reliability, between 2019 and 2021 for the AM and PM peak periods (7:00 to 9:00 a.m. and 4:30 to 6:30 p.m., respectively).

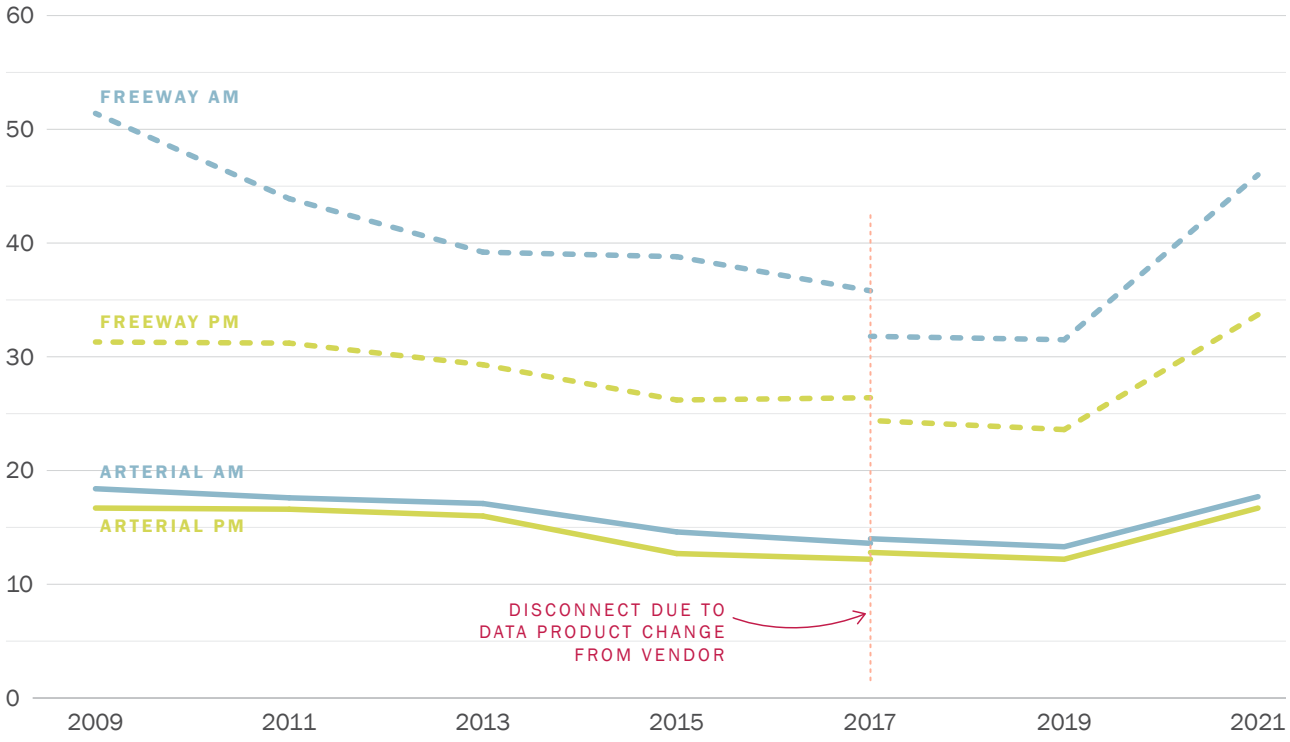
**Table 4-1.** CMP Network Average Travel Speed and Reliability Change

| CATEGORY | TIME PERIOD | TIME-MEAN TRAVEL SPEED (MPH) | | |
|---|---|---|---|---|
| | | 2019 | 2021 | CHANGE |
| Arterial | AM | 13.3 | 17.7 | 33% |
| | PM | 12.2 | 16.7 | 36% |
| Freeway | AM | 31.5 | 46.0 | 46% |
| | PM | 23.6 | 33.7 | 42% |
| **CATEGORY** | **TIME PERIOD** | **BUFFER TIME INDEX** | | |
| | | **2019** | **2021** | **CHANGE** |
| Arterial | AM | 33% | 18% | -15% |
| | PM | 33% | 16% | -17% |
| Freeway | AM | 44% | 40% | -4% |
| | PM | 41% | 35% | -6% |

Average travel speeds on the CMP network have significantly increased since 2019 for all measured time periods and road types. Average arterial travel speeds have increased 33% from 13.3 mph to 17.7 mph in the AM peak and also increased 36% from 12.2 mph to 16.7 mph in the PM peak. The average travel speed on freeways increased 46% from 31.5 mph to 46.0 mph in the AM peak. Average PM travel speed for freeways increased by 42% from 23.6 mph to 33.7 mph. The overall increases in speeds between 2019 and 2021 are a reversal in the trend of declining roadway performance observed for the past decade.

Overall roadway speeds had been declining since 2011 (Figure 4-1). Since the spread of COVID-19 pandemic resulted in a lockdown and Shelter-in-Place (SIP) orders in March 2020, traffic conditions across the Bay Area and in San Francisco changed abruptly. Traffic congestion was non-existent in the months following the lockdown. However, with decreases in the spread of COVID and the gradual re-opening of the economy, traffic has been steadily returning to San Francisco roadways. Despite increasing congestion during the last few months, the peak period speeds on arterials and freeways are still significantly higher than those observed during the 2019 CMP monitoring period.

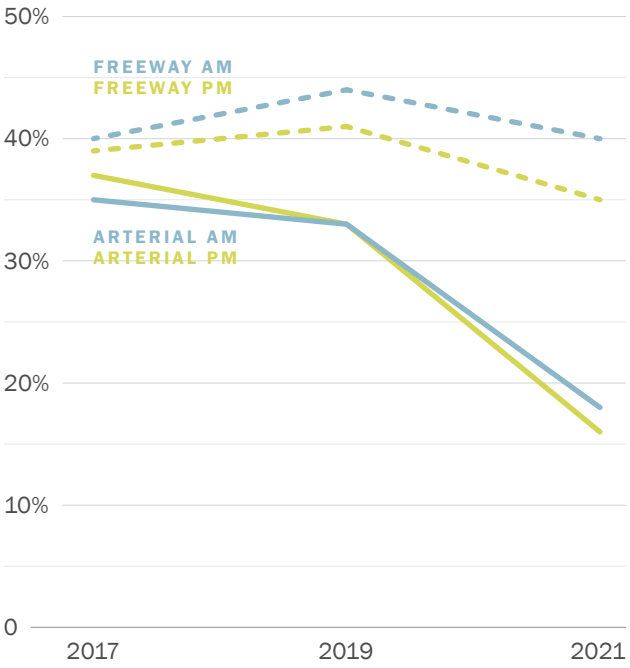
**Figure 4-1.** CMP Network Average Travel Speed Change




**Note:** data collected April – May each year

In addition to speeds and LOS, the BTI reliability metric was derived for all CMP segments for which INRIX data were available. Like auto speed, reliability has improved significantly from 2019 to 2021 (Table 4-1). Note that a lower value of BTI indicates higher reliability. Higher improvement was observed on arterials with 15% – 17% decrease in BTI compared to freeway which saw a 4% – 6% decrease. BTI was also calculated for the past two CMP cycles (2017 and 2019). Interestingly, freeway reliability had worsened between 2017 and 2019 whereas reliability on arterials had improved slightly during the same period (Figure 4-2).

**Figure 4-2.** CMP Network Average Reliability (BTI) Change




**Note:** data collected April – May each year

Table 4-2 documents the slowest CMP segments in the AM and PM peak periods. In 2019, the slowest segments during AM and PM periods had average speeds of 6.2 mph and 4.5 mph respectively. This year, the lowest speeds during AM and PM periods have increased to 8.6 mph and 6.7 mph respectively, which is a 40% – 50% jump.

**Table 4-2.** Slowest Auto Speed CMP Segments in 2021

| AM PEAK PERIOD (7AM – 9AM) | | | PM PEAK PERIOD (4:30 PM – 6:30 PM) | | |
|---|---|---|---|---|---|
| CMP SEGMENT | DIR. | SPEED (MPH) | CMP SEGMENT | DIR. | SPEED (MPH) |
| Octavia: Market to Fell | N | 8.6 | 1st St: Market to Harrison | S | 6.7 |
| Market/Portola: Drumm to Van Ness | W | 8.8 | I-80: US-101 to Fremont Exit | N | 8.7 |
| Drumm: Washington to Market | S | 8.9 | Montgomery: Broadway to Bush | S | 8.9 |
| 9th St: Brannan to Market | N | 10.2 | Drumm: Washington to Market | S | 9.3 |
| Turk: Hyde to Gough | W | 11.0 | Octavia: Market to Fell | N | 10.0 |
| Turk: Market to Hyde | W | 11.0 | Market/Portola: Drumm to Van Ness | W | 10.2 |
| Montgomery: Broadway to Bush | S | 11.0 | Castro/ Divisadero: Geary to 14th | S | 10.4 |
| Market/Portola: Van Ness to Drumm | E | 11.0 | 4th St/Stockton: O'Farrell to Harrison | S | 10.5 |
| Washington: Drumm to Kearny | W | 11.0 | 8th St: Market to Bryant | S | 10.7 |
| Fell: Gough to Market | E | 11.5 | Folsom: 1st to Embarcadero | E | 10.7 |

Table 4-3 identifies the segments that experienced the greatest declines in speed between 2019 and 2021. It is interesting to note that despite significant increases in overall (network-wide) average auto speeds there exist individual segments on which significant declines in speeds were observed. While many of the segments that were in this table last cycle were in the dense northeast quadrant of San Francisco, most of the segments this year are outside that part.

**Table 4-3.** CMP Segments with Highest Percent Decreases in Auto Speeds

| CMP SEGMENT | DIR. | 2019 AUTO SPEED (MPH) | 2021 AUTO SPEED (MPH) | CHANGE (MPH) | PERCENT CHANGE |
|---|---|---|---|---|---|
| **AM PEAK PERIOD (7AM – 9AM)** | | | | | |
| US-101: I-80 to Market | N | 18.64 | 13.14 | -5.50 | -30% |
| West Portal: Ulloa to Sloat | S | 16.40 | 13.97 | -2.43 | -15% |
| Potrero: Cesar Chavez to 21st | N | 16.91 | 15.11 | -1.80 | -11% |
| Pine: Franklin to Presidio | W | 19.28 | 17.70 | -1.57 | -8% |
| Fell: Laguna to Stanyan | W | 19.39 | 18.10 | -1.30 | -7% |
| **PM PEAK PERIOD (4:30 PM – 6:30 PM)** | | | | | |
| Stanyan: Turk to Fulton | S | 13.70 | 10.94 | -2.77 | -20% |
| Gough: Pine to Geary | S | 12.50 | 11.10 | -1.39 | -11% |
| Fell: Laguna to Stanyan | W | 18.70 | 16.62 | -2.08 | -11% |
| 8th St: Market to Bryant | S | 11.82 | 10.66 | -1.16 | -10% |
| Golden Gate: Masonic to Franklin | E | 14.65 | 13.27 | -1.38 | -9% |

Figure 4-3 and Figure 4-4 show the Level of Service by roadway segment for the AM peak and PM peak, respectively. Full LOS monitoring results can be found in

Appendix 5. Figure 4-5 and Figure 4-6 show the BTI by segment for AM and PM peak periods respectively. Interactive versions of these maps can be found on the SFCTA's website at congestion.sfcta.org.

**Figure 4-3.** 2021 Roadway LOS on CMP Network Segments, Weekday AM Peak

**Figure 4-4.** 2021 Roadway LOS on CMP Network Segments, Weekday PM Peak

**Figure 4-5.** 2021 Roadway Buffer Time Index on CMP Network Segments, Weekday AM Peak

**Figure 4-6.** 2021 Roadway Buffer Time Index on CMP Network Segments, Weekday PM Peak

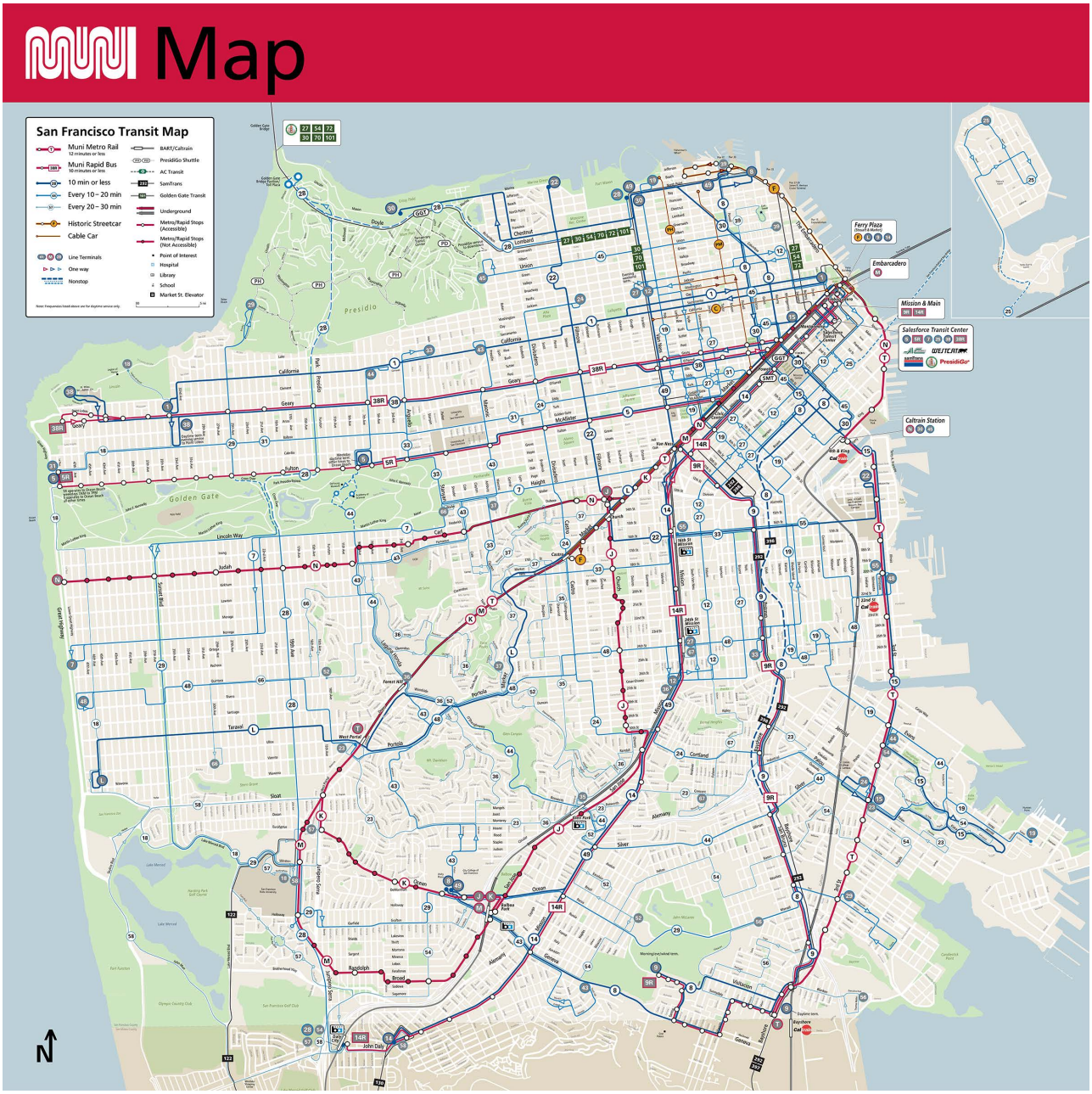
### Deficiency Planning

Since all segments measured at LOS F in the 2021 monitoring were exempt and did not represent a deficiency, and since San Francisco was not found to be deficient for any of the Legislatively Required transit performance measures, no deficiency planning process is triggered by the 2021 CMP. A section describing the exempt statuses of segments measured at LOS F in 2021 can be found in Appendix 5. For a detailed discussion regarding the CMP deficiency planning process, see Appendix 6.

## 4.4.2 TRANSIT COVERAGE/ROUTING AND FREQUENCY

These metrics refer to the pattern and hierarchy of the transit route network (e.g., radial/grid, rapid/local, etc.) and the service area coverage standards. Please see Appendix 7 for details. Prior to COVID-19 pandemic, San Francisco County had the most extensive transit coverage in the Bay Area. Transit service was cut drastically after the pandemic hit in March 2020. As the rate of infections decreases and the economy recovers, Muni routes are gradually being added back in service. Figure 4-7 shows the COVID-19 Core Service that has been effective since August, 2021. Detailed information about coverage and routing standards adopted by Muni and other transit operators serving San Francisco is in Appendix 7. Transit frequency is the number of transit vehicles (buses, trains, or ferries) per hour (e.g., 4 buses per hour). The inverse of the frequency is called "headway," which is the time between transit vehicles (e.g., 15 minutes between buses). Detailed information about transit frequency standards adopted by Muni and other transit operators serving San Francisco is in Appendix 7.

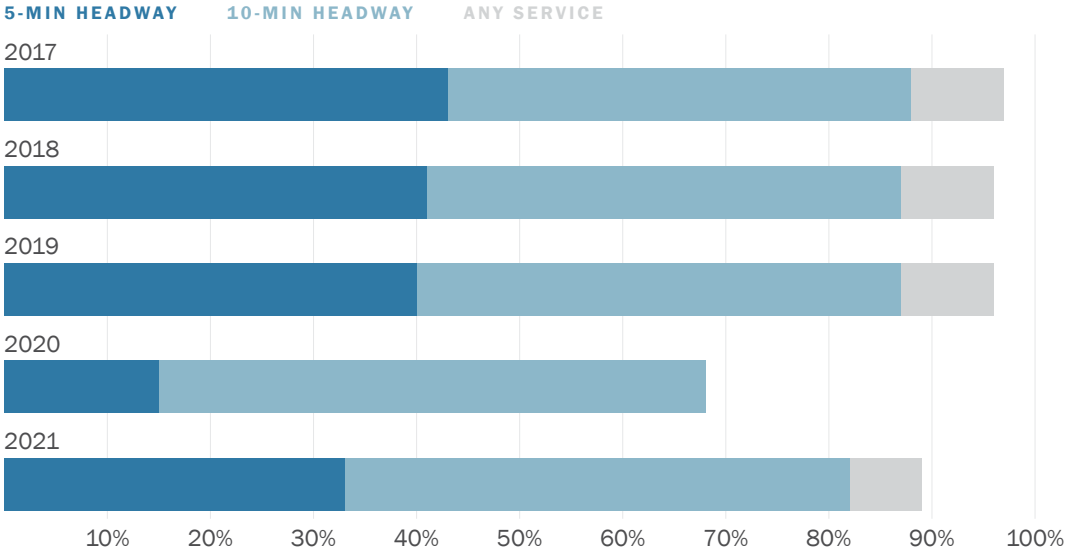
**Figure 4-7.** COVID-19 Muni Core Service Plan Map




This year, a new metric to quantify and track transit coverage by walk access to different levels of headways has been added to the report. This new transit coverage metric reports the percent of total population and total jobs that are within a 5-minute walk of transit service, using Muni's Google Transit Feed Specification (GTFS), and population and employment information derived from the US Census' American Community Survey and San Francisco Planning Department information. The metric has been calculated

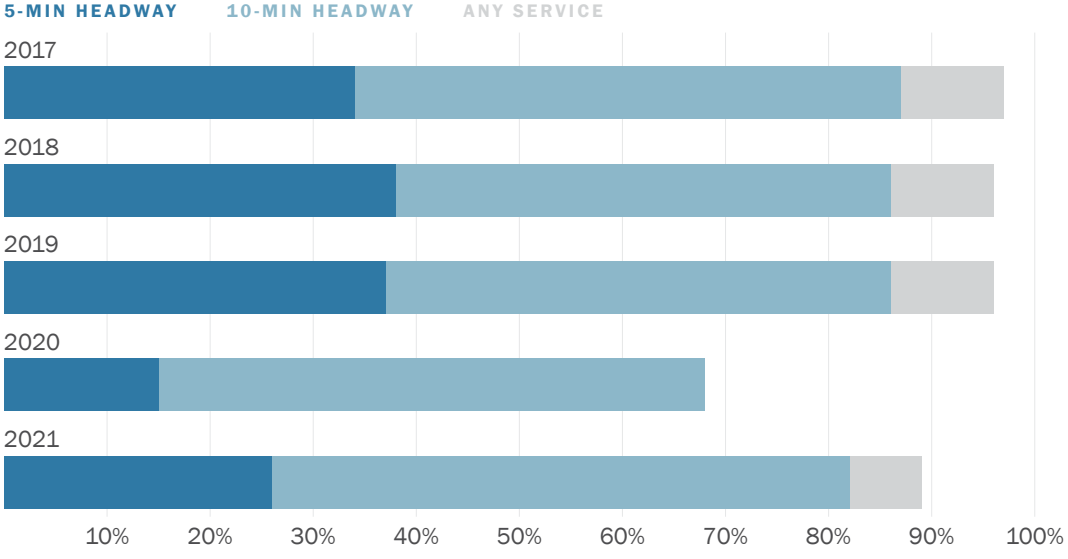
annually for each April – May period from 2017 to 2021. Figure 4-8 and Figure 4-9 show transit coverage in terms of population for AM and PM periods respectively. Prior to COVID-19, over 95% of the population had access to some transit service. During 2020, when substantial cuts to transit service were made, access to any transit dropped to about 70% of the population whereas access to more frequent transit service with 5-minute headway or better dropped from 40% to 15% of the population. Since then, access to 5-minute service and any service have improved to 30% and 90% respectively.

**Figure 4-8.** Percentage of SF Population within 5-min walk by Service, Weekday AM Peak




**Note:** data collected April – May each year

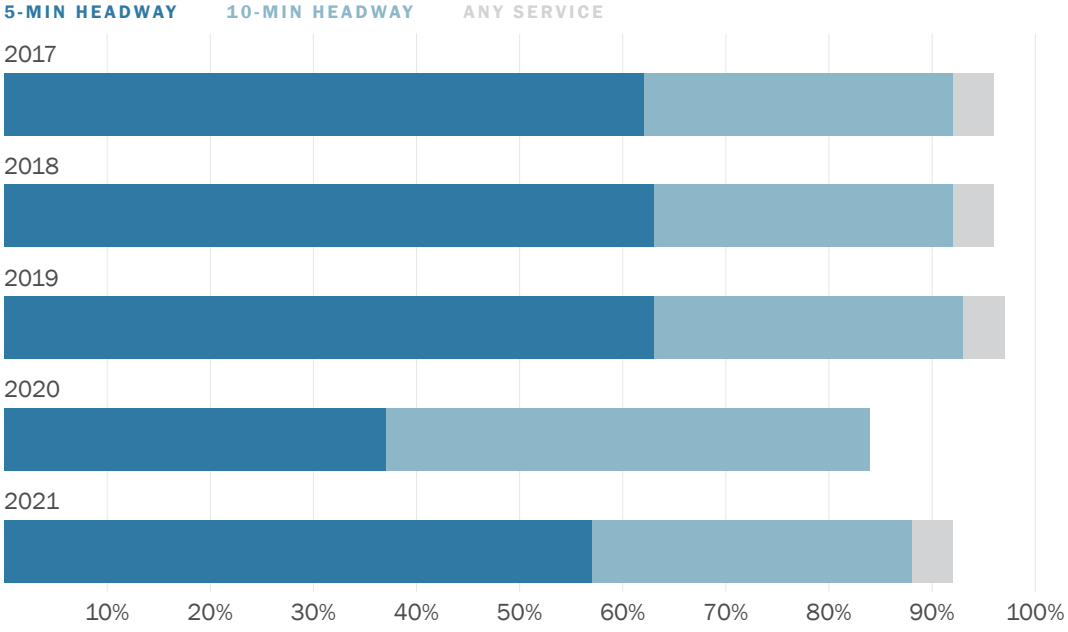
**Figure 4-9.** Percentage of SF Population within 5-min walk by Service, Weekday PM Peak




**Note:** data collected April – May each year

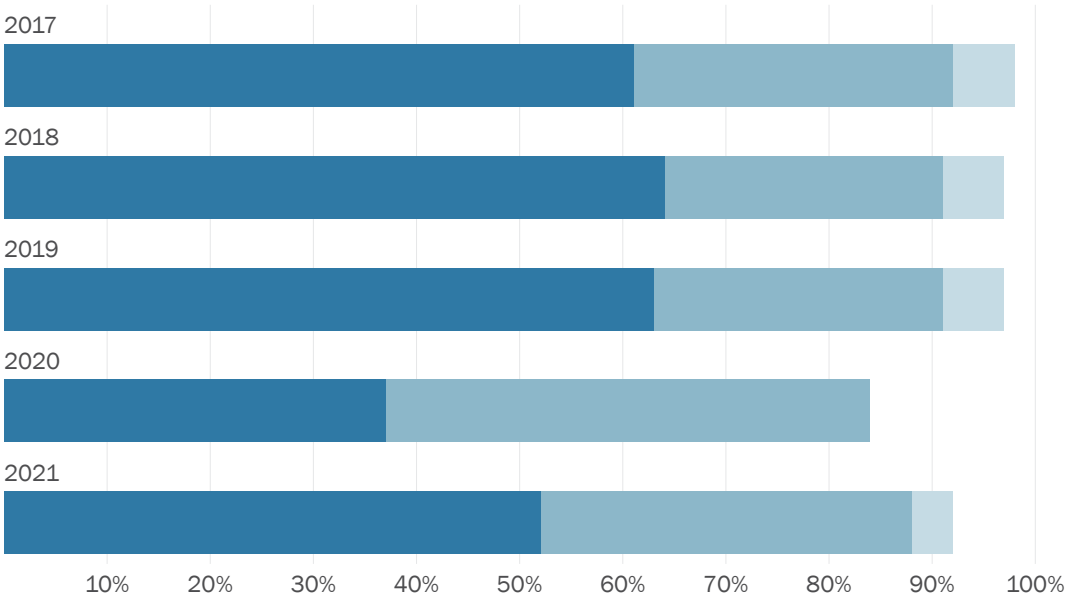
Figure 4-10 and Figure 4-11 show transit coverage in terms of jobs for AM and PM periods respectively. These show access trends similar to those observed in population transit coverage.

**Figure 4-10.** Percentage of SF Jobs within 5-min walk by Service, Weekday AM Peak




**Note:** data collected April – May each year

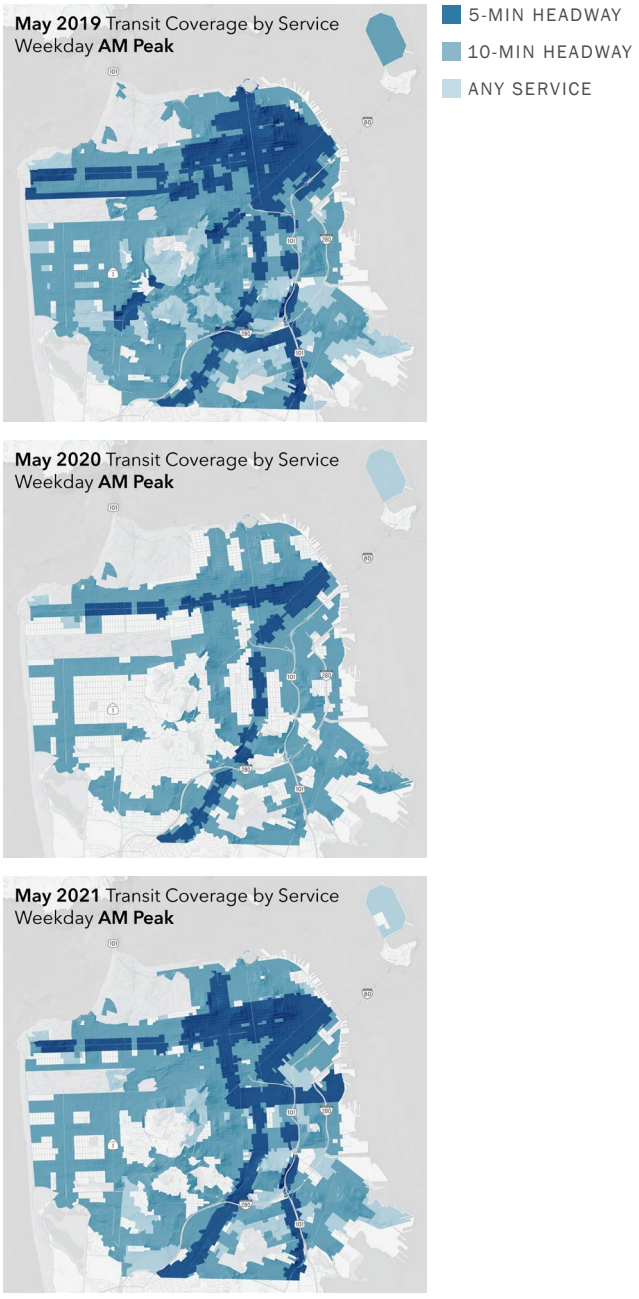
**Figure 4-11.** Percentage of SF Jobs within 5-min walk by Service, Weekday PM Peak




**Note:** data collected April – May each year

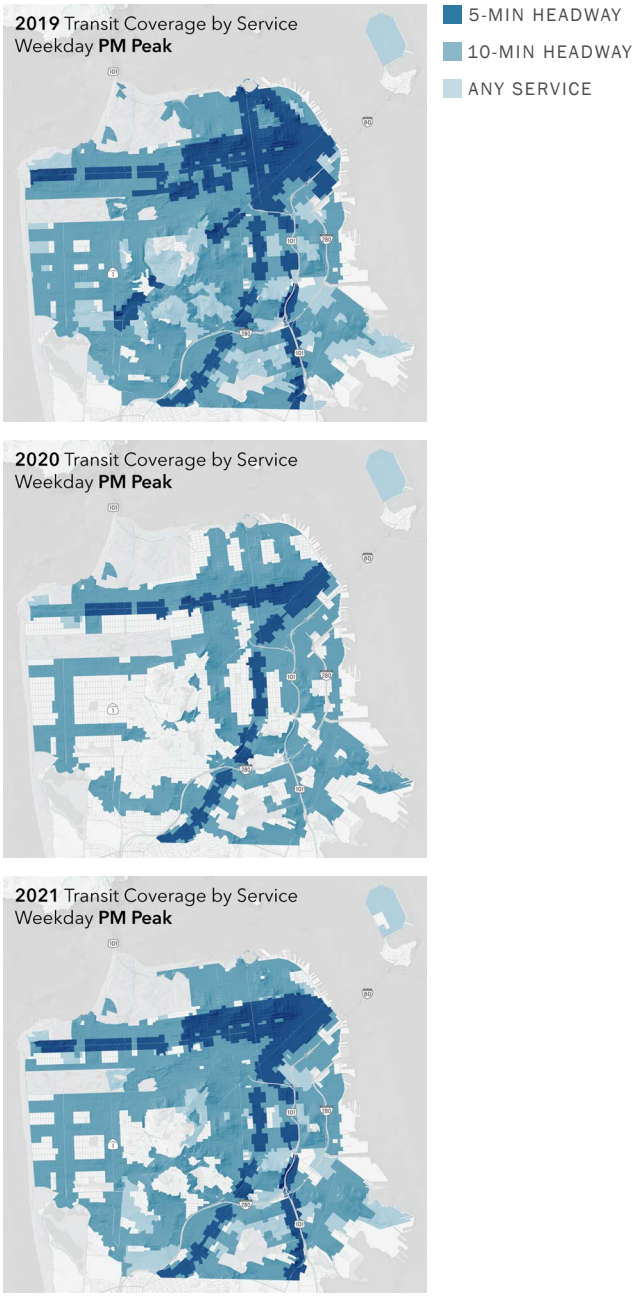
Figure 4-12 and Figure 4-13 show maps of transit coverage for years 2019 through 2021 by service frequency for AM and PM peak periods respectively. Each service frequency layer also includes the areas covered by service frequencies lower than it. For example, the area coverage shown for "Any service" also includes the areas covered under 10-minute and 5-minute frequencies.

**Figure 4-12.** Transit Coverage by Service, Weekday AM Peak




**Note:** data collected April – May each year

**Figure 4-13.** Transit Coverage by Service, Weekday PM Peak




**Note:** data collected April – May each year

### 4.4.3 INTEROPERATOR COORDINATION

This addresses the linkages between transit services provided by different operators (e.g., timed transfers at transit centers, joint fare cards, etc.), to facilitate the use of transit. Senate Bill 602 required that MTC, in coordination with the Bay Area's Regional Transit Coordinating Committee (RTCC), develop rules and regulations for fare and schedule coordination in MTC's nine-county Bay region. SB 1474, passed in 1996, set coordination objectives for the region's transit services, and MTC has adopted Resolution 3055, Transit Coordination Implementation Plan, to comply with SB 1474. This MTC-led process is considered sufficient to meet the intent of CMP law regarding transit service coordination in the region. Compliance with MTC's process by Muni and all other operators serving San Francisco will therefore constitute sufficient grounds for a finding of conformance with CMP transit coordination requirements.

## 4.5 Local Performance Measures

In measuring performance, we are measuring the ability of the system to satisfy the transportation needs of all San Franciscans, and we must therefore measure performance with reference to all types of transportation system users, including transit users, bicyclists and pedestrians. While LOS is well-established as a performance measure for autos, there are few established standards for measuring system performance for transit riders, bicyclists, and pedestrians. Multimodal performance data is increasingly needed for system performance measurement pursuant to updates of the San Francisco Transportation Plan and congestion management planning as well as for project planning, transportation impact analysis, and project prioritization. It is necessary to provide better information to the traveling public, as well as to inform policy decisions about funding of transportation projects and services.

The CMP includes seven types of local multi-modal performance measures:

- Average Transit Speeds
- Transit Speed Variability
- Auto / Transit Speed Ratio
- Bicycle Volumes
- Multimodal Volumes
- Bicycle Network Connectivity
- Pedestrian and Bicycle Safety

### 4.5.1 AVERAGE TRANSIT SPEEDS

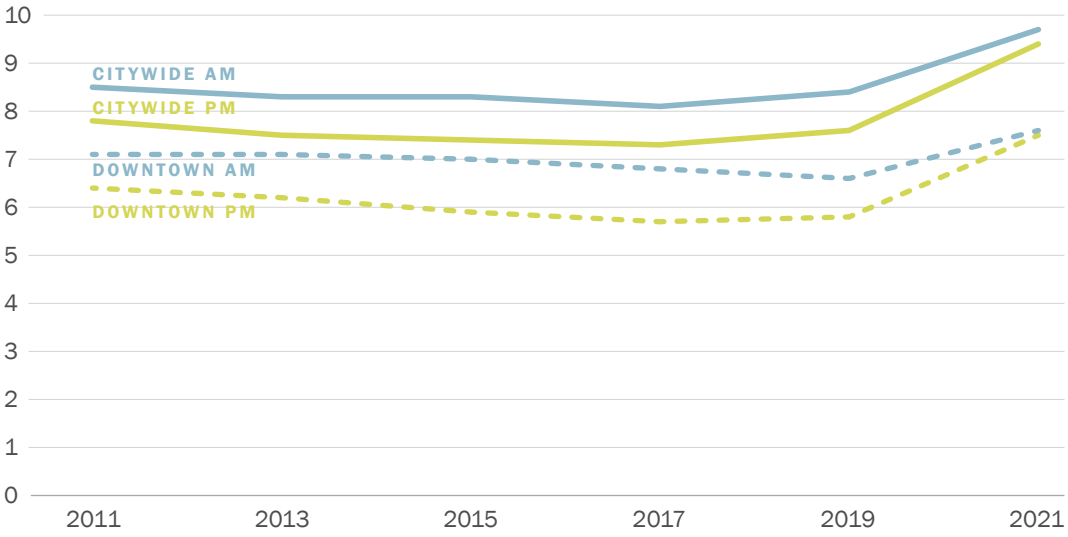
Transit speeds are based on the San Francisco Municipal Transportation Agency's (SFMTA) automatic passenger counter (APC) systems, which are used to collect robust, real-time data on bus performance and ridership. For the 2021 CMP the LOS monitoring, consultants (University of Kentucky) processed two months of APC data collected on Muni's bus (diesel and trolley coach) fleet. Muni light rail vehicles are not currently equipped with APCs, and were thus not included in the analysis. The APC dataset is from April and May of 2021, the same period as the roadway LOS monitoring effort. After undergoing a quality control "cleaning" to eliminate faulty and outlier data samples, the data was filtered to include only weekday peak periods. The same AM and PM peak time periods were as used as in the LOS Monitoring (7:00 a.m. – 9:00 a.m. and 4:30pm – 6:30pm). A detailed description of the APC data collection and analysis methodology can be found in Appendix 8.

Like roadways speeds, transit speeds on the CMP network also increased significantly from 2019 to 2021. The magnitude of the increase was smaller than that observed for roadway speeds. Average transit speed on the CMP network increased by 15% and 24% during AM and PM peak periods respectively. Table 4-4 shows the change in average transit speeds. Figure 4-14 illustrates average bus speeds on CMP segments in the AM and PM peak periods between 2011 and 2021. Appendix 8 contains the full results from all transit segments.

**Table 4-4.** CMP Network Average Transit Speed Change

| CATEGORY | TIME PERIOD | TIME-MEAN TRAVEL SPEED | | |
|---|---|---|---|---|
| | | 2019 | 2021 | CHANGE |
| Arterial | AM | 8.4 | 9.7 | 15% |
| | PM | 7.6 | 9.4 | 24% |

**Figure 4-14.** Overall Average Transit Speeds Trend for CMP Network




**Note:** data collected April – May each year

Table 4-5 shows CMP segments with the slowest bus speeds in 2021. Transit speeds on the slowest segments are all over 5 mph which is a significant improvement, given that most of the slowest segments in 2019 saw transit speeds well under 5 mph. Table 4-6 identifies the CMP segments with the greatest relative changes in average bus speeds. In the PM peak, there were modest decreases in speeds of less than 1 mph and relative decreases of less than 15%. In the AM peak, speed decreases between 2019 and 2021 were in the range of 1 – 2 mph and the maximum relative decrease was 16%. In contrast, highest relative decreases in bus speeds between 2017 and 2019 ranged from 20% – 45%. Figure 4-15 and Figure 4-16 show maps of 2021 monitored transit speeds by segment for the AM peak and PM peak, respectively.

**Table 4-5.** Slowest Bus Speed CMP Segments in 2021

| AM PEAK PERIOD (7AM – 9AM) | | | PM PEAK PERIOD (4:30 PM – 6:30 PM) | | |
|---|---|---|---|---|---|
| CMP SEGMENT | DIR. | SPEED (MPH) | CMP SEGMENT | DIR. | SPEED (MPH) |
| Columbus: North Point to Greenwich | S | 5.2 | Geneva: Cayuga to Paris | E | 5.1 |
| Van Ness/S Van Ness: Washington to Lombard | N | 5.2 | Ocean: Howth to Miramar | W | 5.2 |
| Kearny: Market to Columbus | N | 5.3 | Castro/Divisadero: Pine to Geary | S | 5.3 |
| Castro/Divisadero: Geary to Pine | N | 5.5 | Castro/Divisadero: Geary to Pine | N | 5.4 |
| Mission/Otis: Embarcadero to 3rd | S | 5.6 | Columbus: North Point to Greenwich | S | 5.5 |
| Clay: Kearny to Davis | E | 6.0 | Mission/Otis: Embarcadero to 3rd | S | 5.7 |
| Castro/Divisadero: Pine to Geary | S | 6.0 | 4th St/Stockton: O'Farrell to Harrison | S | 6.0 |
| 4th St/Stockton: O'Farrell to Harrison | S | 6.3 | Castro/Divisadero: Geary to 14th | S | 6.1 |
| Van Ness/S Van Ness: Golden Gate to Washington | N | 6.4 | Van Ness/ S Van Ness: Washington to Golden Gate | S | 6.4 |
| Ocean: Howth to Miramar | W | 6.8 | Van Ness/S Van Ness: Golden Gate to 13th | S | 6.4 |

**Table 4-6.** CMP Segments with Highest Percent Decreases in Bus Speeds

| CMP SEGMENT | DIR. | 2019 BUS SPEED (MPH) | 2021 BUS SPEED (MPH) | CHANGE (MPH) | PERCENT CHANGE |
|---|---|---|---|---|---|
| **AM PEAK PERIOD (7AM – 9AM)** | | | | | |
| Fulton: Arguello to 10th Ave | W | 11.5 | 9.6 | -1.8 | -16% |
| Junipero Serra: 19th to Brotherhood | S | 15.2 | 12.9 | -2.2 | -15% |
| Fulton: Masonic to Arguello | W | 8.9 | 7.7 | -1.2 | -14% |
| Evans: 3rd to Cesar Chavez | N | 16.1 | 13.9 | -2.2 | -14% |
| West Portal: Ulloa to Sloat | S | 7.7 | 6.9 | -0.8 | -10% |
| **PM PEAK PERIOD (4:30 PM – 6:30 PM)** | | | | | |
| Ocean: Howth to Miramar | W | 6.1 | 5.2 | -0.9 | -14% |
| 19th Ave/Park Presidio: Lake to Lincoln | S | 10.0 | 9.1 | -0.9 | -9% |
| Fulton: Masonic to Arguello | W | 8.0 | 7.3 | -0.7 | -9% |
| Geneva: Cayuga to Ocean | W | 9.2 | 9.0 | -0.2 | -2% |
| Fulton: 10th Ave to Arguello | W | 7.0 | 6.9 | -0.1 | -1% |

**Figure 4-15.** 2021 Average Muni Bus Speeds on CMP Network Segments, Weekday AM Peak

**Figure 4-16.** 2021 Average Muni Bus Speeds on CMP Network Segments, Weekday PM Peak

### 4.5.2 TRANSIT SPEED VARIABILITY

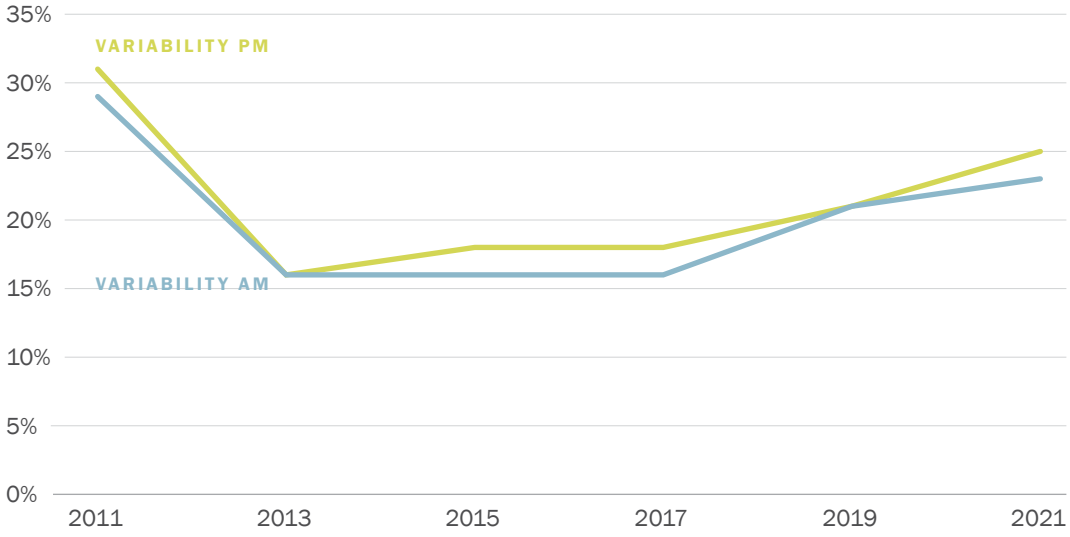
Transit speed variability measures are also based on the same data derived from San Francisco Municipal Transportation Agency's (SFMTA) automatic passenger counter (APC) systems as was used to calculate average transit speeds. A detailed description of the APC data collection and analysis methodology can be found in Appendix 8. The standard deviation and coefficient of variation of travel speed provide indicators of how reliable transit vehicle travel times are for a given segment. The standard deviation provides an absolute measure of variability, and indicates in minutes how far from the mean speeds typically range. The coefficient of variation (CV) is calculated by dividing the standard deviation by the average speed, thereby normalizing the results to compare relative variability between faster and slower segments. The CV is expressed as a percentage of the mean speed. A lower percentage indicates more reliable transit speeds.

Transit reliability declined between 2019 and 2021 as shown in Table 4-7 and Figure 4-17. This continues the trend observed from 2017 to 2019. This decline is opposite to the improvement in transit speed observed between 2019 and 2021. It is also opposite to improved auto speed and reliability during the same period. It would not be unreasonable to expect an improvement in transit reliability given that COVID-19 had generally resulted in better transportation system performance. However, it is not necessary that speed and reliability move in the same direction (which is one reason why both these metrics are monitored in the CMP). One potential reason for this change in transit reliability could be Muni's emphasis on restoring a greater mix of stop-rich and local service post-pandemic. Table 4-8 lists the least reliable transit segments in the AM and PM peak periods. Most unreliable segments have coefficients of variation between 30% and 40%. Unlike in 2019, none of the segments have a CV of less than 30%. The most unreliable segment in the PM peak has a CV of over 50% which means given an average bus speed of 6 mph, approximately one third of the time, the speeds on the segment either exceed 9 mph or are less than 3 mph. Appendix 8 contains the full results from all transit segments. Figure 4-18 and Figure 4-19 show maps of transit reliability by segment for the AM peak and PM peak, respectively.

**Table 4-7.** CMP Network Average Transit Speed Variability (Coefficient of Variation)

| | 2013 | 2015 | 2017 | 2019 | 2021 |
|---|---|---|---|---|---|
| AM | 16% | 16% | 16% | 21% | 23% |
| PM | 16% | 18% | 18% | 21% | 25% |

**Figure 4-17.** Overall Transit Speed Variability Trend for CMP Network




**Note:** data collected April – May each year

**Table 4-8.** Least Reliable Transit Segments in 2021

| SEGMENT | DIR. | AVERAGE TRANSIT SPEED (MPH) | TRANSIT SPEED STANDARD DEVIATION (MPH) | COEFFICIENT OF VARIATION |
|---|---|---|---|---|
| **AM PEAK PERIOD** | | | | |
| 16th St: Potrero to Mission | W | 9.6 | 4.4 | 46% |
| North Point: Columbus to Embarcadero | E | 9.8 | 4.1 | 41% |
| Broadway: Powell to Montgomery | E | 8.5 | 3.3 | 39% |
| Evans: Cesar Chavez to 3rd | S | 9.7 | 3.6 | 37% |
| Mission/Otis: Embarcadero to 3rd | S | 5.6 | 2.0 | 37% |
| 4th St/Stockton: O'Farrell to Harrison | S | 6.3 | 2.2 | 36% |
| West Portal: Sloat to Ulloa | N | 9.2 | 3.2 | 35% |
| Van Ness/S Van Ness: 13th to Golden Gate | N | 7.6 | 2.6 | 34% |
| Market/Portola: Guerrero to Van Ness | E | 9.2 | 3.1 | 33% |
| Masonic: Page to Geary | N | 11.7 | 3.8 | 33% |
| **PM PEAK PERIOD** | | | | |
| Mission/Otis: Embarcadero to 3rd | S | 5.7 | 3.2 | 56% |
| North Point: Van Ness to Columbus | E | 6.6 | 3.3 | 49% |
| Guerrero/San Jose: 29th to Monterey | S | 32.6 | 14.4 | 44% |
| 16th St: Potrero to Mission | W | 9.3 | 3.9 | 42% |
| Ocean: Howth to Miramar | W | 5.2 | 2.1 | 40% |
| North Point: Columbus to Van Ness | W | 7.8 | 2.9 | 37% |
| Geneva: Cayuga to Paris | E | 5.1 | 1.9 | 37% |
| Masonic: Geary to Page | S | 8.0 | 2.9 | 37% |
| Evans: Cesar Chavez to 3rd | S | 10.7 | 3.9 | 36% |
| Fulton: 10th Ave to Park Presidio | W | 8.5 | 3.0 | 36% |

**Figure 4-18.** 2021 Average Muni Bus Speed Variability on CMP Network Segments, Weekday AM Peak

**Figure 4-19.** 2021 Average Muni Bus Speed Variability on CMP Network Segments, Weekday PM Peak

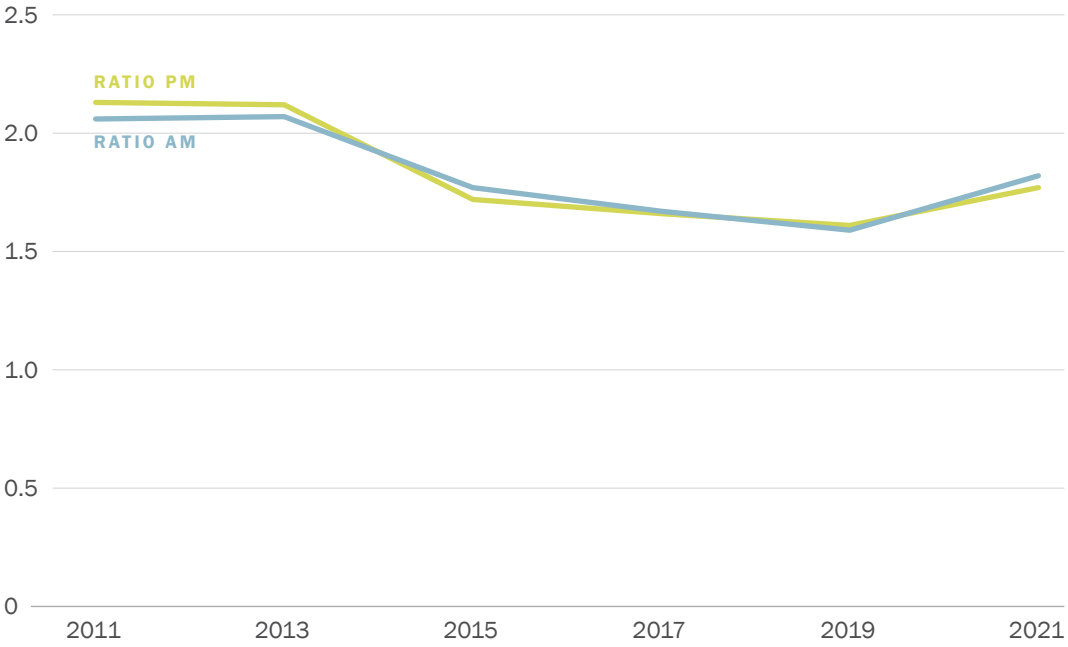
### 4.5.3 AUTO / TRANSIT SPEED RATIO

In order to assess the competitiveness of transit with driving, the ratio of auto to transit speeds is calculated by comparing auto to transit speeds on the portions of the CMP network for which Muni data was available. Roadway speeds are derived from the Inrix data used for LOS monitoring and transit speeds are derived from APC data. The APC dataset is from April and May of 2021, the same period as the roadway LOS monitoring effort. For each segment, the ratio of auto-to-transit speed was calculated. A ratio of 2 would indicate that, for a particular segment, on-board transit travel time is twice that of auto travel time. As shown in Table 4-9, the average auto-transit speed ratio declined between 2019 and 2021. The ratio had been improving between 2011 and 2019 (Figure 4-20). Both average auto and transit speeds improved this year but auto speeds improved more than transit speeds which resulted in transit being less competitive relative to auto. Table 4-10 shows the ten segments with the highest auto-to-transit speed ratios for the AM peak and PM peak. Compared to 2019, there are more segments that have a ratio of closer to 3 which means driving is three time faster than using transit on these segments. Appendix 8 contains the full auto-to-transit speed results from all transit segments. Figure 4-21 and Figure 4-22 show maps of auto-to-transit ratios by segment for the AM peak and PM peak, respectively.

**Table 4-9.** CMP Network Auto/Transit Speed Ratio Change

| TIME PERIOD | 2013 | 2015 | 2017 | 2019 | 2021 |
|---|---|---|---|---|---|
| AM | 2.07 | 1.77 | 1.67 | 1.59 | 1.82 |
| PM | 2.12 | 1.72 | 1.66 | 1.61 | 1.77 |

**Figure 4-20.** Overall Auto-Transit Speed Ratio Trend for CMP Network




**Note:** data collected April – May each year

**Table 4-10.** Largest CMP Segment-level Auto-to-Transit Speed Ratios

| CMP SEGMENT | DIR. | AVG. AUTO SPEED (MPH) | AVG.TRANSIT SPEED (MPH) | AUTO/TRANSIT SPEED RATIO |
|---|---|---|---|---|
| **AM PEAK PERIOD** | | | | |
| Junipero Serra: 19th to Brotherhood | S | 45.6 | 12.9 | 3.5 |
| King: 2nd to 4th | W | 21.6 | 7.0 | 3.1 |
| Columbus: North Point to Greenwich | S | 14.4 | 5.2 | 2.8 |
| Potrero: 21st to Cesar Chavez | S | 21.4 | 8.1 | 2.6 |
| Geneva: Cayuga to Paris | E | 17.4 | 6.8 | 2.5 |
| Mission/Otis: Embarcadero to 3rd | S | 13.4 | 5.6 | 2.4 |
| Van Ness/S Van Ness: Washington to Lombard | N | 12.5 | 5.2 | 2.4 |
| Geneva: Paris to Cayuga | W | 16.5 | 6.9 | 2.4 |
| Fulton: Arguello to 10th Ave | W | 22.6 | 9.6 | 2.3 |
| 19th Ave/Park Presidio: Sloat to Junipero Serra | S | 28.1 | 12.1 | 2.3 |
| **PM PEAK PERIOD** | | | | |
| Junipero Serra: 19th to Brotherhood | S | 42.7 | 12.9 | 3.3 |
| Geneva: Cayuga to Paris | E | 15.1 | 5.1 | 2.9 |
| Van Ness/S Van Ness: Washington to Lombard | N | 18.6 | 7.0 | 2.7 |
| Ocean: Howth to Miramar | W | 13.9 | 5.2 | 2.7 |
| Geneva: Paris to Cayuga | W | 16.0 | 6.6 | 2.4 |
| Fulton: 10th Ave to Park Presidio | W | 20.1 | 8.5 | 2.4 |
| North Point: Van Ness to Columbus | E | 15.4 | 6.6 | 2.3 |
| Columbus: North Point to Greenwich | S | 12.8 | 5.5 | 2.3 |
| Castro/Divisadero: Geary to Pine | N | 12.3 | 5.4 | 2.3 |
| Mission/Otis: Embarcadero to 3rd | S | 12.9 | 5.7 | 2.3 |

**Figure 4-21.** 2021 Auto-to-Transit Speed Ratios on CMP Network Segments, Weekday AM Peak

**Figure 4-22.** 2021 Auto-to-Transit Speed Ratios on CMP Network Segments, Weekday PM Peak

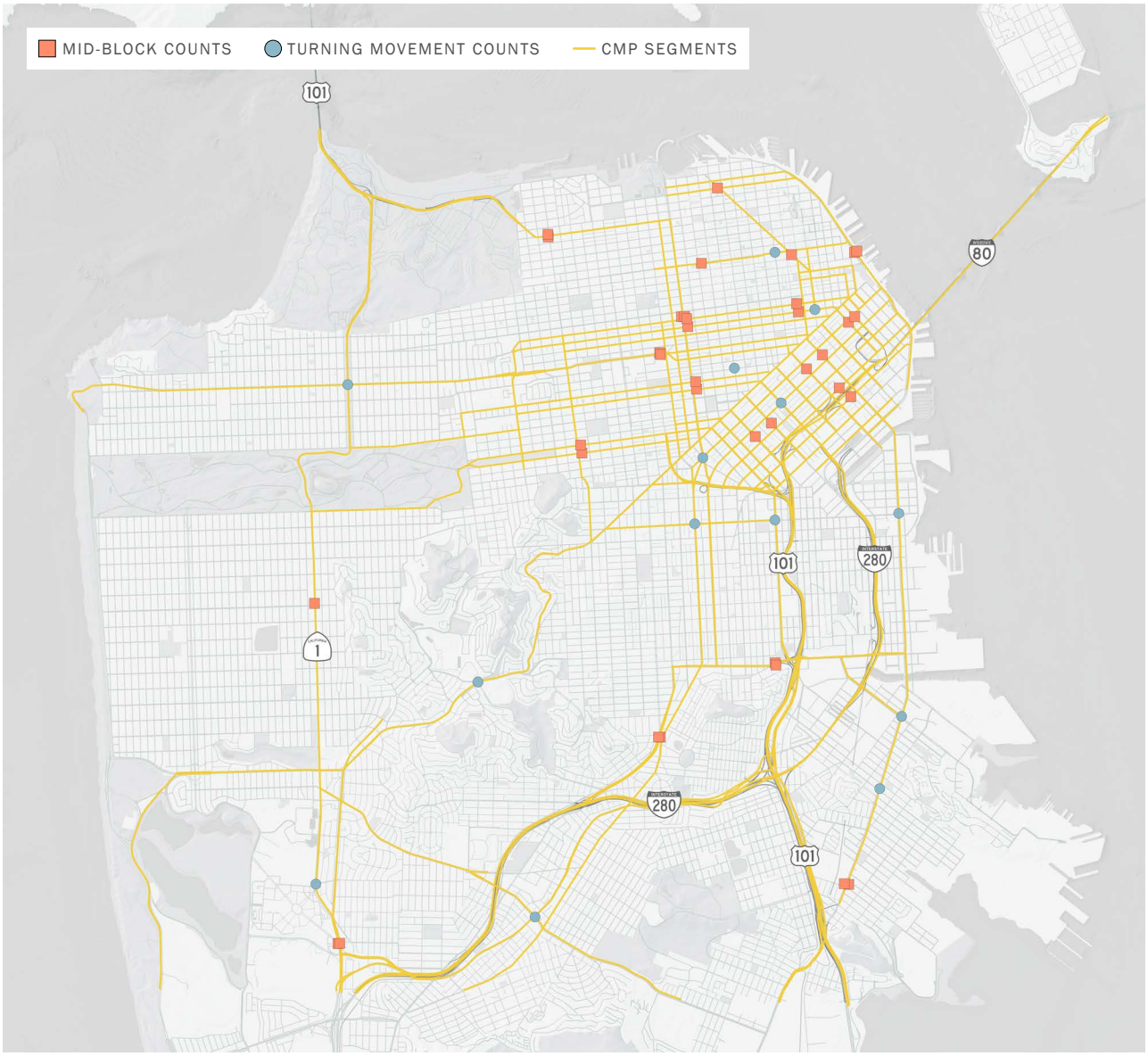
### 4.5.4 MULTIMODAL VOLUMES

Congestion on city streets is the outcome of several factors including the number of cars driving; the roadway capacity available; construction, lane blockages, and other special events; allocation of signal green-time to various competing modes and movements. Similarly, crowding on transit is also a result of several factors including the number of riders; vehicle size, frequency of service, origin-destination demand patterns. These factors can be roughly classified into supply-side and demand-side. In order to understand the latter, and create a set of data that can be analyzed longitudinally by various modes, beginning with the 2015 CMP and continuing through 2021 CMP, the Transportation Authority supported a multimodal volume monitoring program which collected mainline auto volumes at 28 locations and intersection auto, bike, and pedestrian counts at 14 locations.

The City and County of San Francisco has placed a high priority on shifting travelers' modes to increase the number of trips made by walking and bicycling. Unlike automobile and transit volumes, increasing volumes of pedestrian and bicycle traffic are a direct indicator of system performance because increased use of these modes alleviates, rather than causes, traffic congestion and transit crowding. Walking and bicycling are space-efficient, healthy, and environmentally beneficial ways to travel, and have minimal negative impact on surrounding communities. Little data has historically been available to measure the numbers of trips made by walking and bicycling, but City and County agencies are now working together to collect volume data for both modes on a more regular basis. Bicycle and pedestrian volumes are reasonable proxies for the "performance" of these non-motorized modes of travel. Auto volumes are also collected for relative comparison and to indicate trends.

Figure 4-23 shows locations where counts were collected. The mainline counts are continuous 3-day midweek counts (including two locations where weekend counts were also collected) for vehicles only. The intersection counts were conducted on one day, with 2-hour AM peak and 2-hour PM peak counts, totaling 4-hours of counts at each location for not both pedestrians and bicyclists in addition to vehicles. By collecting volume at a fixed set of locations on a biennial basis, we may gain insights into trends over time.

**Figure 4-23.** Locations of Turning Movement and Mid-Block Counts

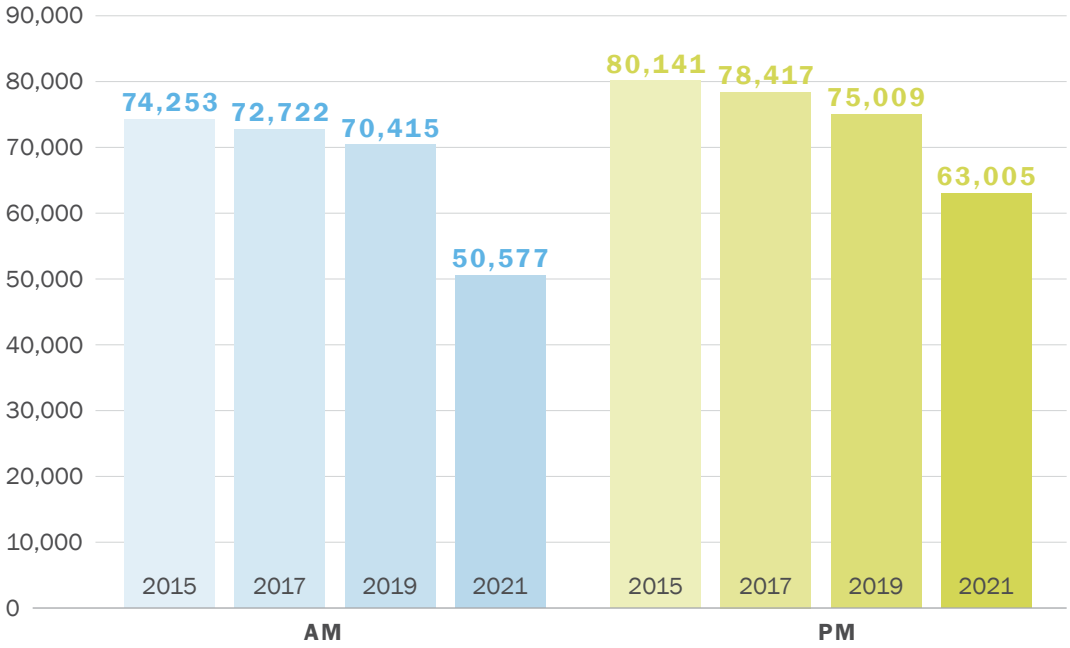



## Vehicle Counts

Vehicle counts are collected at both intersections and mid-block locations. It is expected that this database will grow over time and provide information about long term performance trends just like LOS monitoring. Figure 4-24 shows the results of total vehicle volumes traversing through all intersection count locations and Figure 4-25 shows results from mid-block/mainline counts collection. The mainline counts were processed to obtain the average daily traffic (ADT) for a typical weekday. Appendix 9 contains detailed count information. The impact of COVID-19 on vehicle

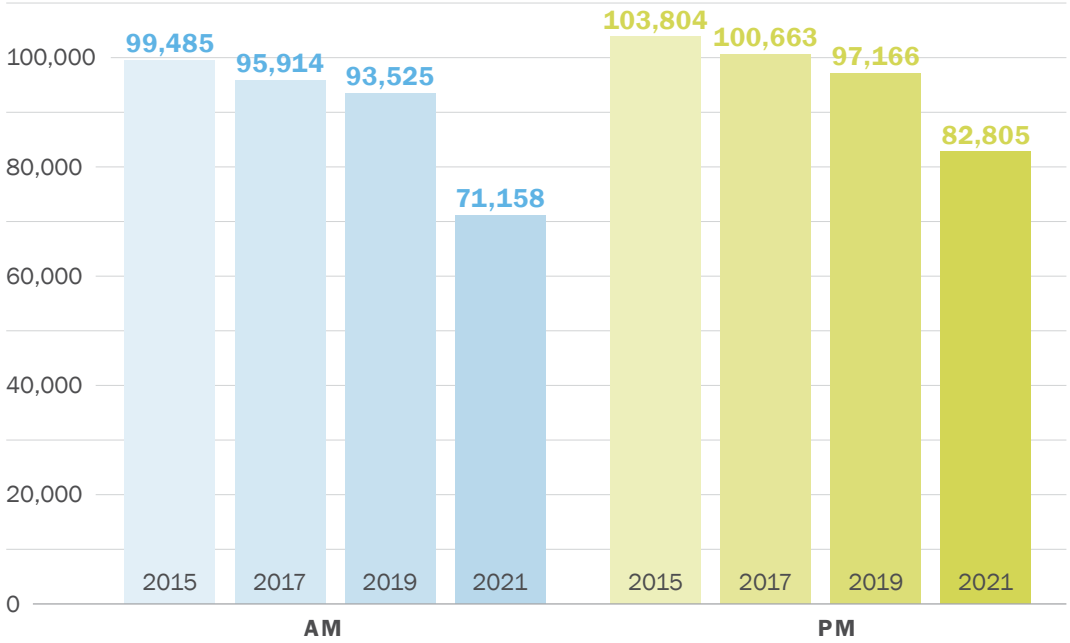
counts can be clearly seen in the figures. Volumes were down significantly at both intersection and mid-block locations. Overall, vehicle counts declined by 15% – 30% across AM and PM peak periods.

**Figure 4-24.** SFCTA Intersection Vehicle Counts 2015 – 2021




**Note:** data collected April – May each year, volumes represented are collected at the same locations for all years.

**Figure 4-25.** Weekday Mainline/Average Daily Traffic (ADT) Counts 2015 – 2021



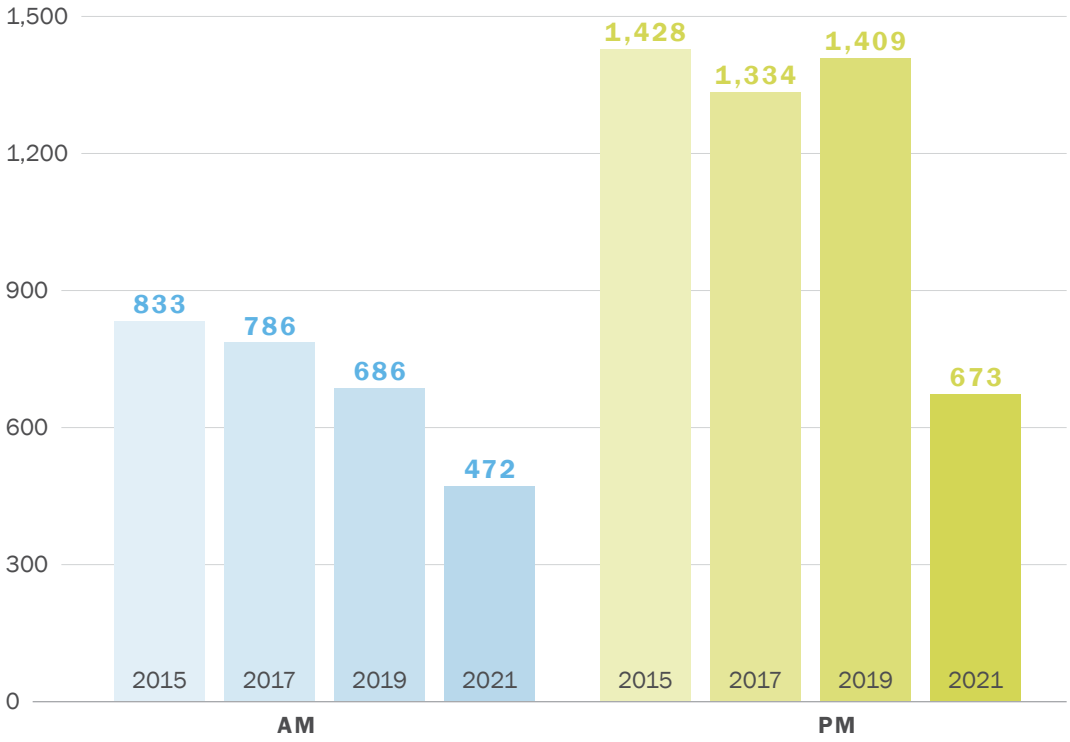

**Note:** data collected April – May each year, volumes represented are collected at the same locations for all years.

## Bicycle Counts

SFMTA has conducted citywide bicycle counts at key intersections and corridors since 2006. Starting 2018, the number of locations were expanded to 37 and the durations of data collection were expanded to 7:00 a.m. to 10:00 a.m. and 4:00 p.m. to 8:00 p.m. The data are usually collected in Fall (September – October) of each year. The total bike count grew from 45,688 in 2018 to 52,151 in 2019 (a 14% increase). SFMTA has not conducted new counts since 2019 due to the pandemic, so we are unable to provide and SFMTA estimate for 2021.

In addition to the SFMTA, SFCTA has continued to collect manual bike counts as part of the multimodal counts effort at intersection locations (see Figure 4-23). Bicycle counts were recorded for 2 hours each in the AM (7:00 a.m. – 9:00 a.m.) and PM (4:30 p.m. – 6:30 p.m.) peak periods at 14 intersections around the city in May 2021. Figure 4-26 shows total counts for all locations for 2015 – 2021. Like vehicle counts, bike counts also dropped significantly from 2019 to 2021. Counts dropped by over 30% during the AM peak and over 50% during the PM peak.

**Figure 4-26.** SFCTA Manual Bicycle Counts 2015 – 2021

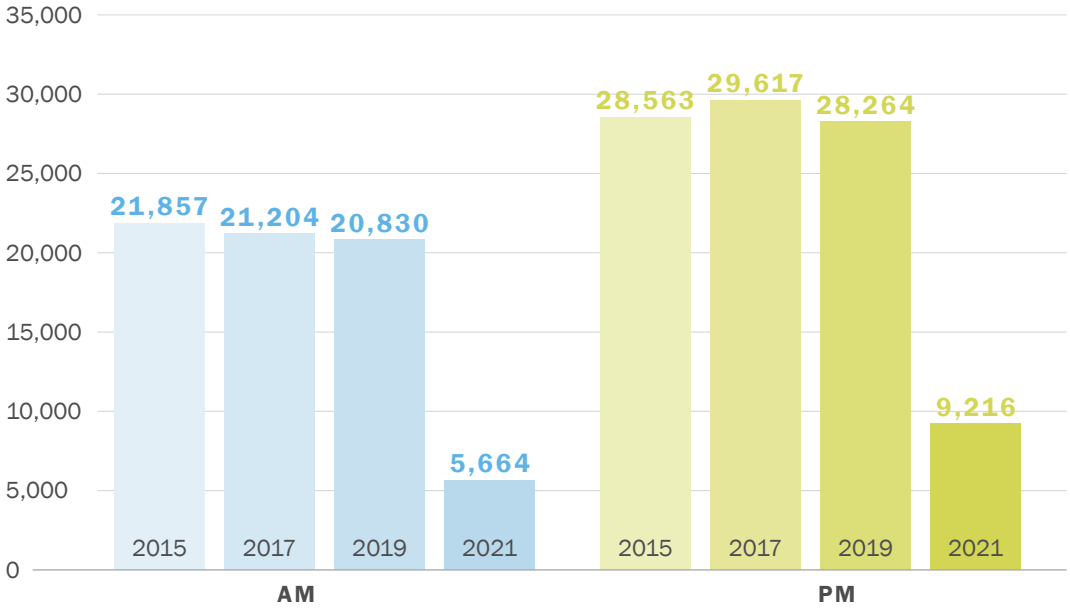



**Note:** data collected April – May each year, volumes represented are collected at the same locations for all years.

### Pedestrian Counts

Finally, pedestrian counts are also collected at intersections in addition to vehicle and bicycle counts. Figure 4-27 shows the aggregate counts for 2015 through 2021. Pedestrian counts dropped even more precipitously than vehicle or bike counts. Between 2019 and 2021, pedestrian volumes fell by 73% and 67% during AM and PM peak hours respectively.

**Figure 4-27.** SFCTA Intersection Pedestrian Counts 2015 – 2021

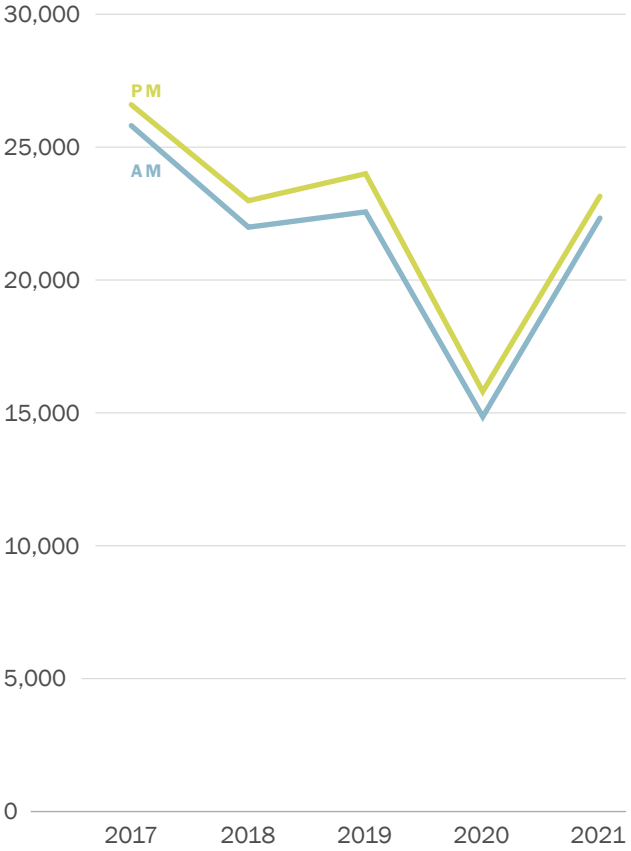



**Note:** data collected April – May each year, volumes represented are collected at the same locations for all years.

## 4.5.5 SCREENLINE VOLUMES

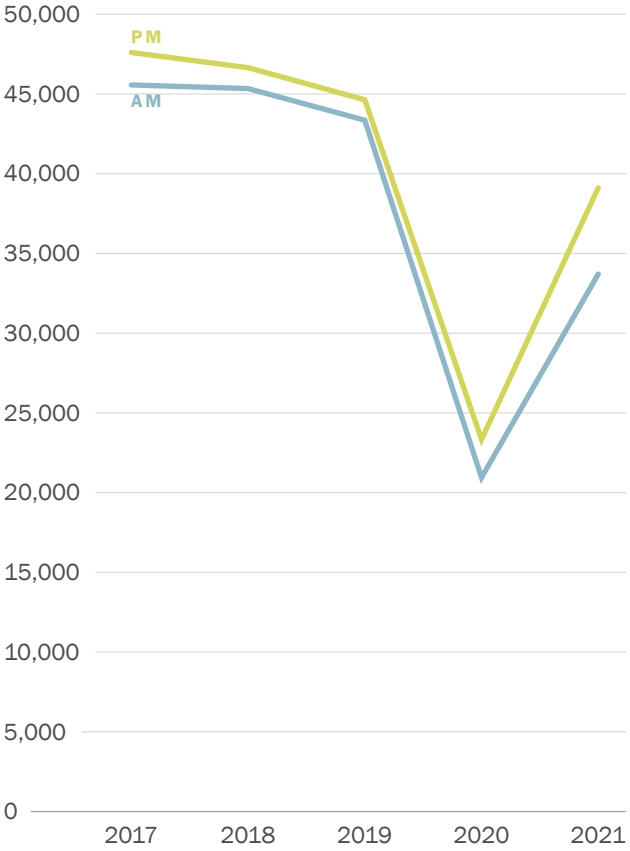
A screenline is an imaginary line that divides an area into two sections. It is usually defined in such a way that a given roadway crosses it only once. Counts are conducted on roadways at the screenline to understand traffic flow patterns between the two sections. Vehicle volumes at two screenlines are reported this year during the AM (7:00 to 9:00 a.m) and PM (4:30 to 6:30 p.m.) peak periods by processing data from Caltrans Performance Measurement System (PeMS). One screenline is across the Bay Bridge and the other is at the San Mateo countyline on the US-101 and I-280 freeways. Figure 4-28 shows that weekday peak volumes at the Bay Bridge screenline dropped by about 40% between 2019 and 2020 (due to COVID) but have almost completely bounced back to pre-pandemic levels in 2021. Figure 4-29 shows the total average peak period volumes on US-101 and I-280 freeways at San Mateo countyline. The volumes at this screenline saw a larger drop of about 50% between 2019 and 2020. In 2021, a significant portion of the peak period volumes have returned with the average AM and PM volumes at about 80% and 90% of their 2019 levels respectively.

**Figure 4-28.** Average Bay Bridge Screenline Volumes, Weekday Peak Period




**Note:** data collected April – May each year

**Figure 4-29.** Total Average US-101 and I-280 Volumes at San Mateo Countyline, Weekday Peak Period




**Note:** data collected April – May each year

### 4.5.6 BICYCLE NETWORK CONNECTIVITY

The extent and connectivity of the pedestrian and bicycle networks are important metrics of non-motorized transportation performance. Comprehensive networks that allow pedestrians and bicyclists to travel easily and safely between destinations are essential to encourage non-motorized travel as an alternative to driving and contributing to traffic congestion.

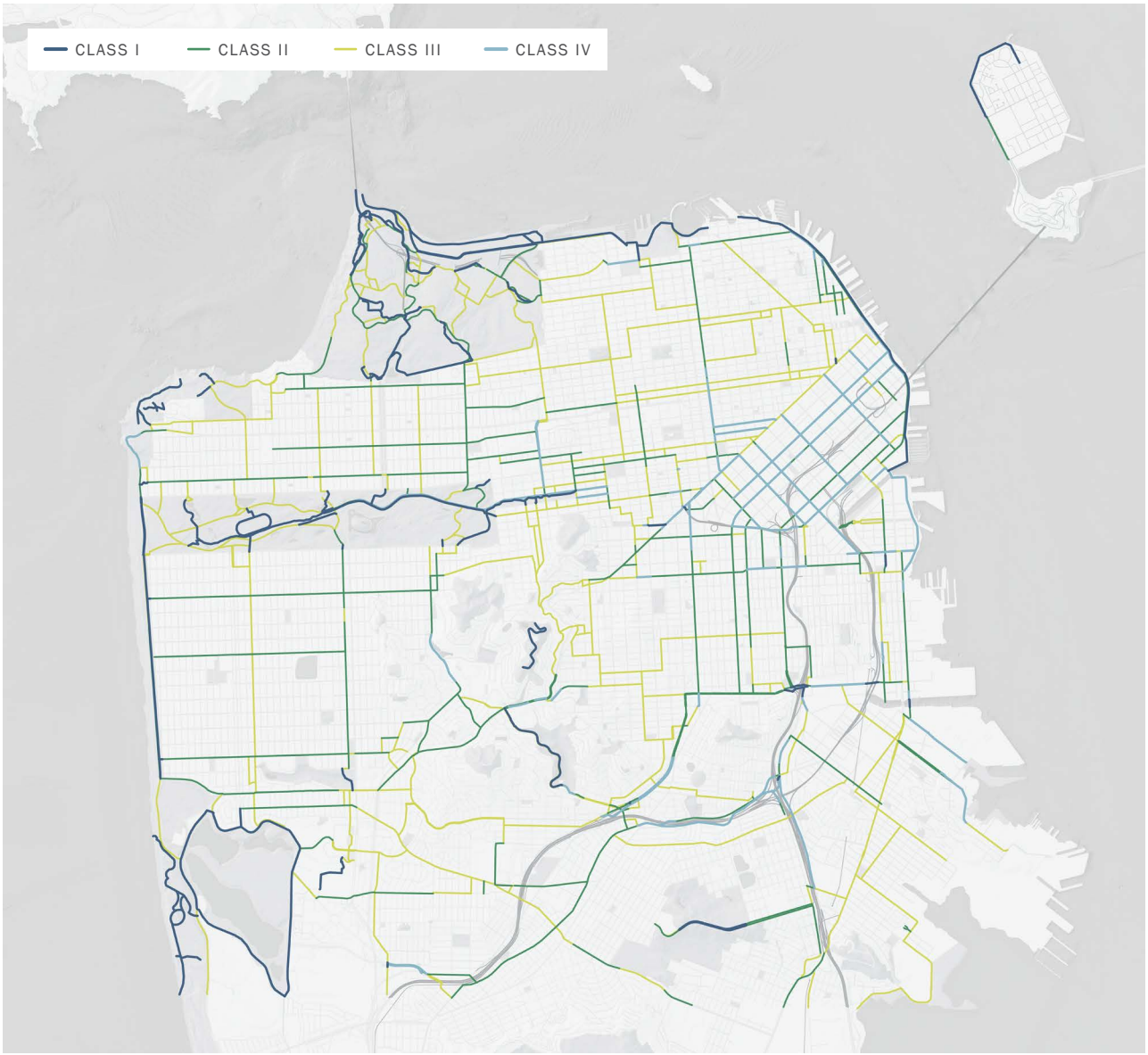
Table 4-11 summarizes length of bicycle facilities by type. As of November 2021, the completed network included 464 miles of bike routes, of which 17% were Class I paths and 30% were Class II designated bicycle lanes. About 44% of bikeways are Class III signed routes in shared lanes, many of which have wide shoulders or are marked with sharrows. Between 2019 and 2021, some Class III facilities were upgraded to Class IV bike facilities that are separated by a vertical element from the rest of traffic. Due to this, total miles of Class III facilities dropped while total miles of Class IV facilities increased from 28 miles to 42 miles between 2019 and 2021.

**Table 4-11.** Miles of San Francisco Bicycle Facilities by Type, 2013 to 2021

| | 2013 | 2015 | 2017 | 2019 | 2021 |
|---|---|---|---|---|---|
| Bicycle Path (Class I) | 60 | 60 | 62 | 78 | 78 |
| Bicycle Lane (Class II)* | 125 | 133 | 137 | 136 | 139 |
| Bicycle Route (Class III) | 213 | 214 | 214 | 210 | 204 |
| Separated Bikeways (Class IV)** | 15 | 16 | 16 | 28 | 42 |
| **Total** | **413** | **422** | **429** | **452** | **464** |

Source: SFMTA
* includes bike lanes and buffered bike lanes (paint only).
** includes bike lanes with vertical barrier element.

**Figure 4-30.** San Francisco Bicycle Network



### 4.5.7 PEDESTRIAN AND BICYCLE SAFETY

Safety for pedestrians and cyclists are key measures of non-motorized transportation performance, and a critical policy priority for the city of San Francisco. The City and County of San Francisco adopted Vision Zero as a policy in 2014, committing to build better and safer streets, educate the public on traffic safety, enforce traffic laws, and adopt policy changes that save lives. The goal is to create a culture that prioritizes traffic safety and to ensure that mistakes don't result in serious injuries or death.

The California Statewide Integrated Traffic Records System (SWITRS) maintained by the California Highway Patrol compiles all local collision reports into a unified database. Fatalities from traffic collisions are tracked, and collisions resulting in injury are classified by severity of injury. Table 4-12 displays injury and fatality statistics by involved party for the most recent decade for which traffic collision data has been analyzed (2010 – 2020).

Figure 4-31 shows that both pedestrian and bicycle injury collisions which had been stable between 2016 and 2019 have dropped significantly in 2020. A portion of this decrease may be attributable to the substantial reduction in vehicle and non-motorized volumes in 2020 due to COVID pandemic. Figure 4-32 shows shows that while pedestrian fatalities have decreased between 2019 and 2020, bicycle fatalities have gone up slightly in the same period. However, the total non-motorized fatalities are lower in 2020 than 2018 and 2019.

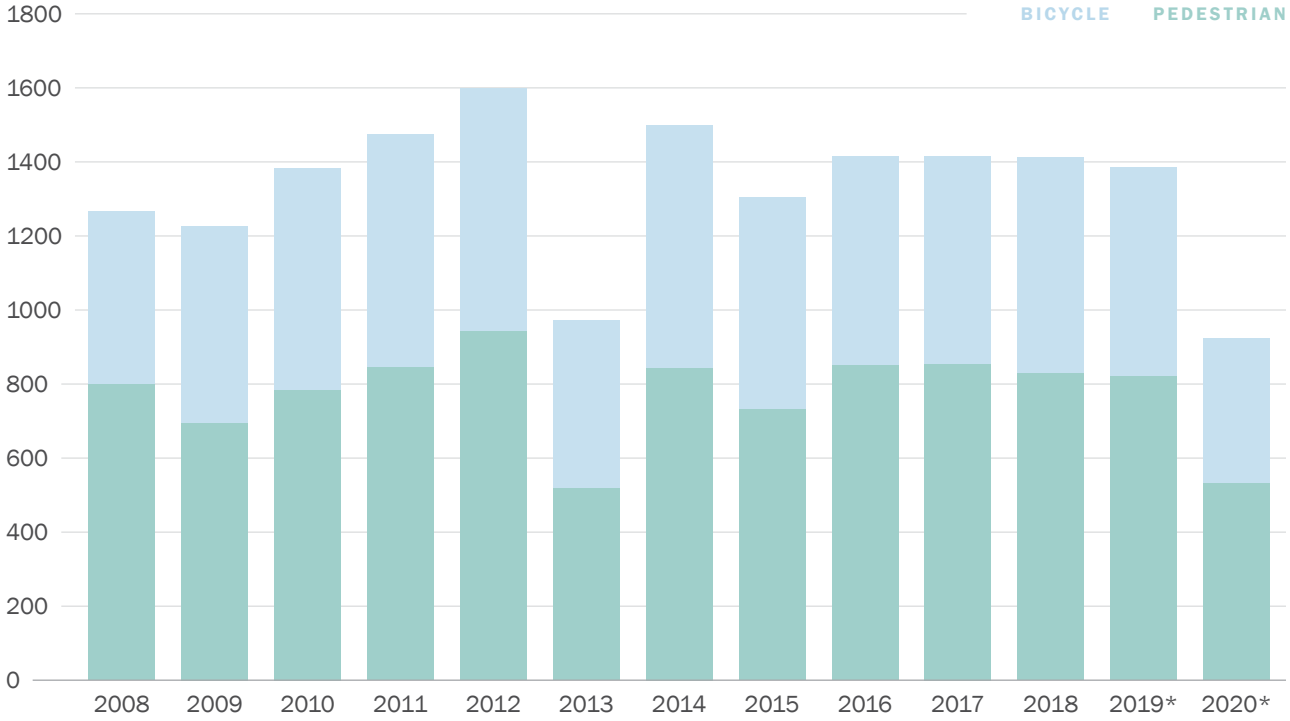
**Table 4-12.** Traffic Collision Injuries and Fatalities by Involved Party, 2006 – 2020

| | | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019* | 2020* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Injury Collisions | Pedestrians | 784 | 844 | 942 | 518 | 843 | 731 | 850 | 854 | 828 | 820 | 531 |
| | Bicyclists | 599 | 630 | 658 | 454 | 657 | 574 | 566 | 562 | 584 | 567 | 394 |
| Fatal Collisions | Pedestrians | 14 | 17 | 16 | 21 | 18 | 25 | 19 | 15 | 16 | 19 | 14 |
| | Bicyclists | 1 | 4 | 2 | 4 | 2 | 4 | 4 | 2 | 4 | 1 | 2 |

Source: Transportation Injury Mapping System (TIMS), Safe Transportation Research and Education Center, University of California, Berkeley. 2021

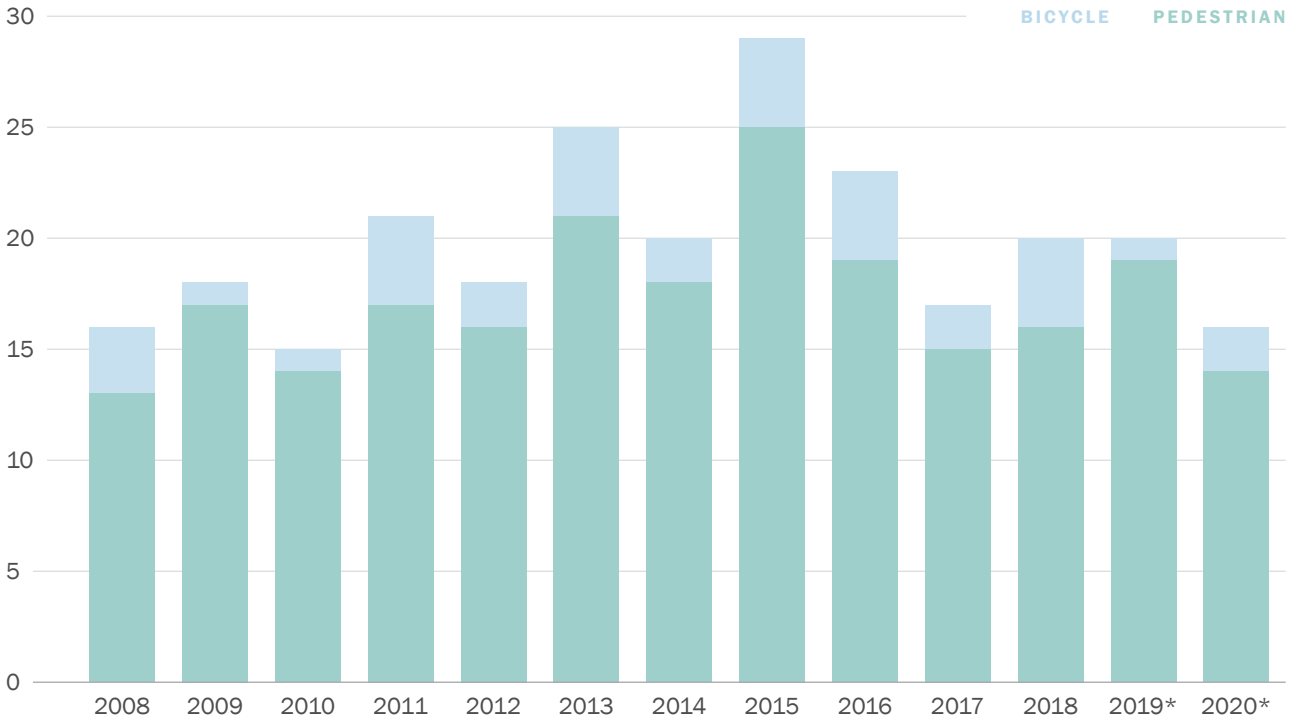
* provisional data

**Figure 4-31.** Injury Collisions Involving Pedestrians and Bicyclists in San Francisco




* provisional data.

**Figure 4-32.** Fatal Collisions Involving Pedestrians and Bicyclists in San Francisco




* provisional data.

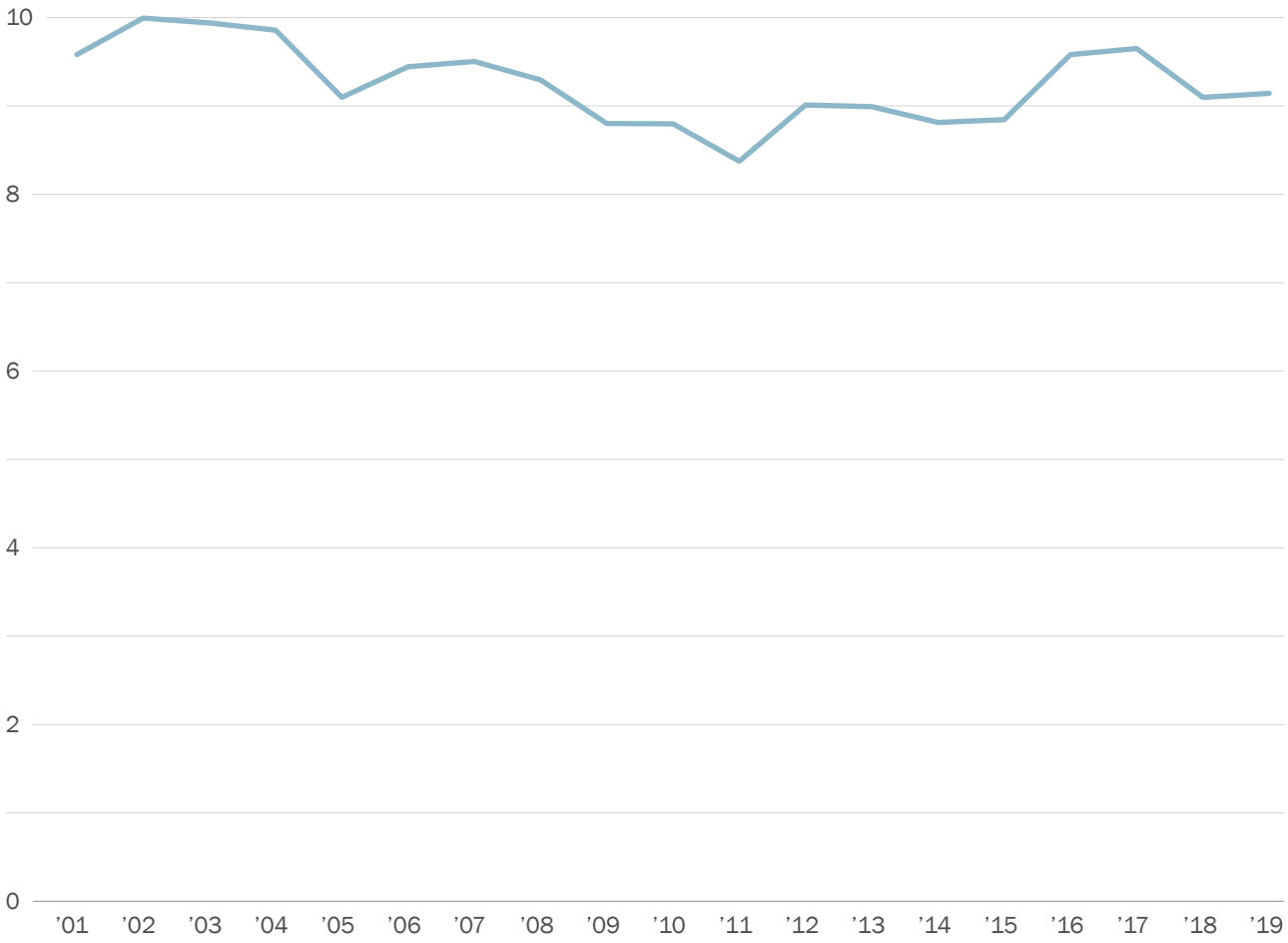
### 4.5.8 OTHER INDICATORS

In addition to the legislatively required performance measures and the local performance measures, several other metrics help provide background and context for changes observed in transportation system performance.

#### Vehicle miles traveled

In 2016, the San Francisco Planning Commission adopted new guidelines for evaluating the transportation impacts of new projects. Critically, additional automobile delay as measured by level-of-service (LOS) is no longer considered an environmental impact, and environmental impact determinations now use vehicle miles travelled. Figure 4-33 illustrates the trend in estimated VMT on San Francisco roadways. It shows that VMT dipped by about 5% between 2017 and 2019. Note that there is a two-year lag in this estimate provided by Caltrans.

**Figure 4-33.** Daily Vehicle Miles Traveled in San Francisco (millions)

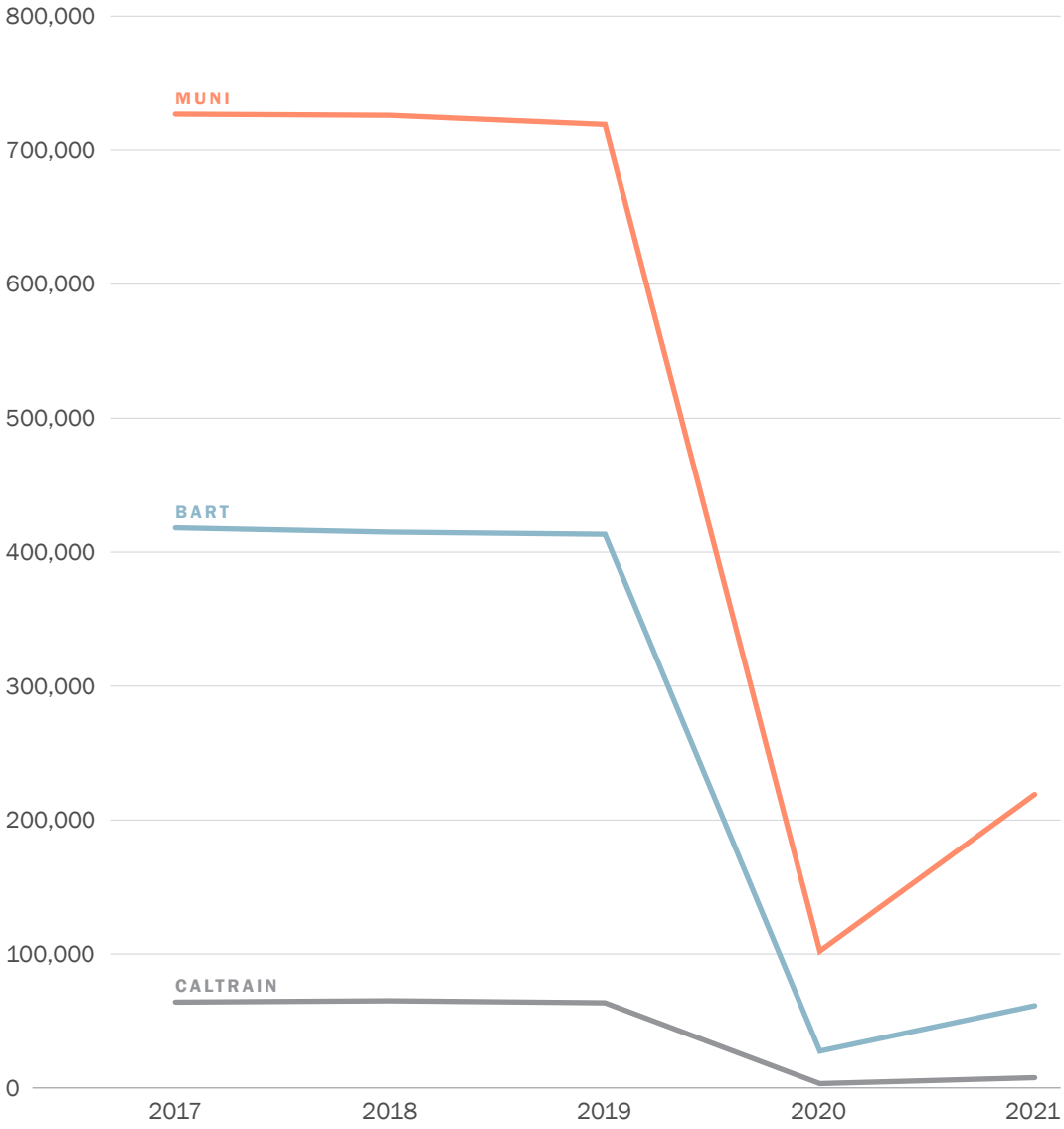



Source: Caltrans

## Transit Ridership

Transit Ridership refers to the total boardings occurring on transit services. Figure 4-34 shows recent ridership trends for the three largest transit systems serving San Francisco. The chart shows the average daily ridership across the months of April and May except for Caltrain. For Caltrain, the ridership data are collected around the month of February. Prior to the pandemic, all three systems experienced slight declines in ridership between 2017 and 2019. Muni carried the greatest number of trips in San Francisco, approximately 700,000 on a typical weekday, before COVID-19 pandemic. Ridership on all three operators took a significant hit with the spread of COVID in April – May of 2020. Since then, however, ridership has been gradually climbing back up every month.

**Figure 4-34.** Average Daily Transit Ridership by Operator




Source: SFMTA/BART/Caltrans
**Note:** data collected April – May each year except for Caltrain it is February

## Mode Share

Mode share describes the mix of modes, such as transit, biking, walking, and driving, used to travel to, from and within San Francisco. Figure 4-35 and Figure 4-36 summarize the share of trips by mode for two different travel markets: Intra-SF, which are all trips that both start and end in San Francisco (3 million trips approx.), and To/From SF, which are trips where one of the trip ends is in San Francisco and the other trip end is not (1.5 million trips approx.). Walking is by far the most prevalent mode used to get around within San Francisco (43.4%), followed by various types of driving such as driving alone, sharing a ride, or using a TNC (37.3%), and using transit (15.8%). In contrast, travel to/from San Francisco is dominated by driving (59.6%), but with a large transit share as well (39%). Figure 4-37 shows mode shares for the two markets (Intra-SF and To/From SF) combined. These data were derived from a large scale survey completed in 2019 prior to the pandemic. The Transportation Authority anticipates that this survey will be deployed again in 2022/2023, so that trends in mode shares can begin to be tracked on a more regular basis.

**Figure 4-35.** Mode Split for Intra-San Francisco Person Trips

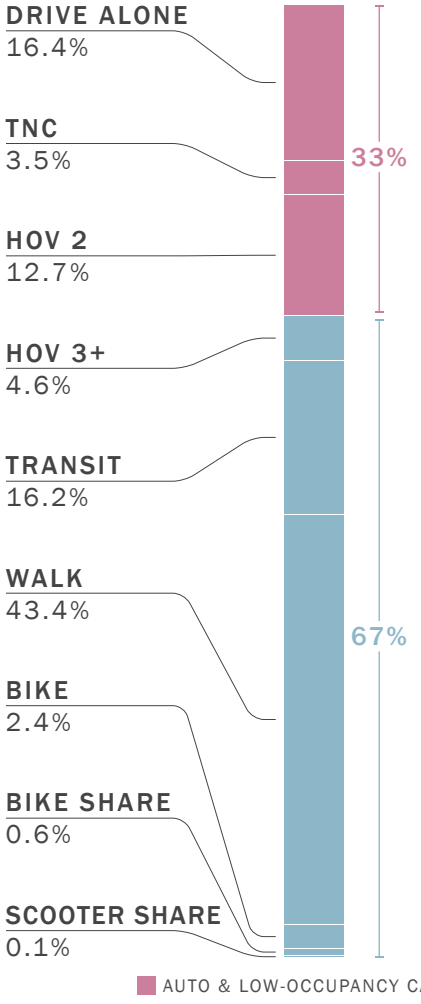



**Figure 4-36.** Mode Split for Regional To/From San Francisco Person Trips

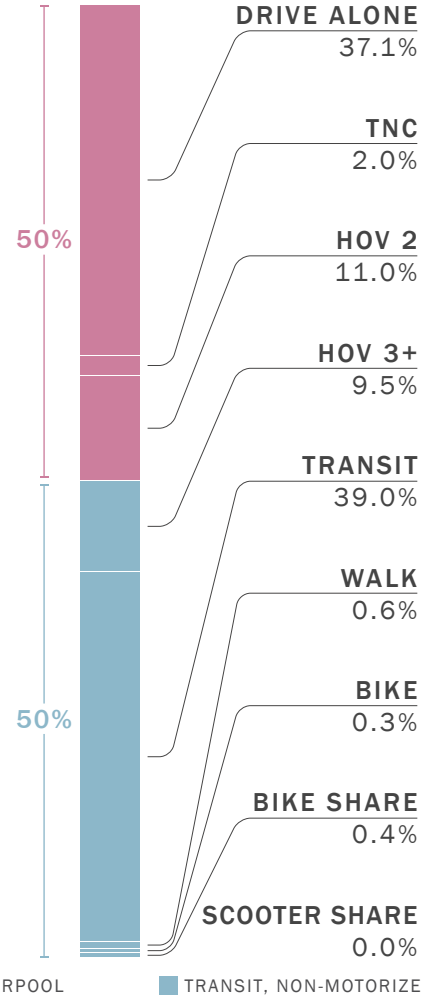
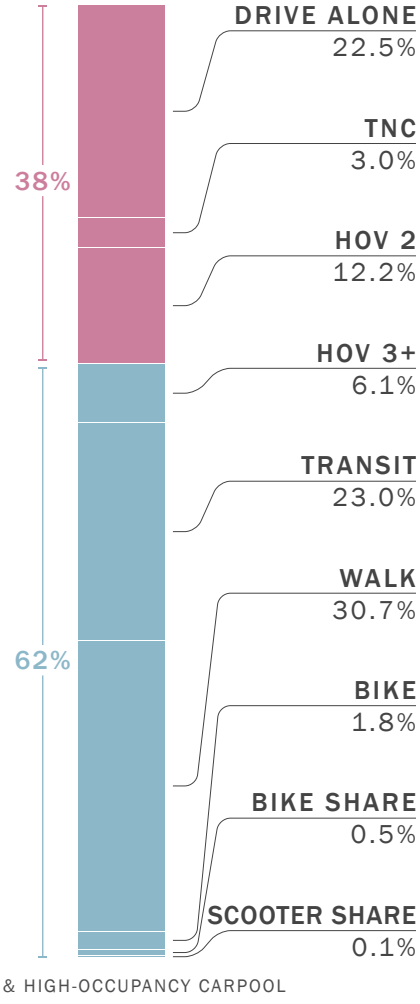



**Figure 4-37.** Combined mode split for Intra/To/From San Francisco Person Trips




### 4.5.9 MUNI SERVICE STANDARDS AND MILESTONES

In November 1999, San Francisco voters passed Proposition E which, among other changes, amended the City Charter to require the creation of service standards and milestones for Muni to attain. The SFMTA Board of Directors updates these periodically. Historic service standards and milestones that directly pertain to the improvement of Muni performance can be found in Appendix 7.

Muni's recent progress to achieving these standards can be found in Table 4-13. Muni has lately focused on headway performance than on-time performance. The headway performance is measured as the percentage of transit trips with 5+ minute headway gaps. Though the target of less than 10.6% for this metric has not been achieved yet, the performance has gradually improved to 12.5% in FY21. The proportion of scheduled service hours delivered has increased since the last CMP update at 97.7%, slightly lower than the goal of 98.5%. The impact of COVID can be seen the most on the percentage of peak period trips over capacity. For the last two years, this metric has been well below the target 13%.

**Table 4-13.** Muni Service Standards and Goals 2016 – 2021

| STANDARD | FY 17/18 GOAL | FY 17/18 ACTUAL | FY 18/19 GOAL | FY 18/19 ACTUAL | FY 19/20 GOAL | FY 19/20 ACTUAL* | FY 20/21 GOAL | FY 20/21 ACTUAL* |
|---|---|---|---|---|---|---|---|---|
| **Percentage of transit trips with 5+ min gaps** | <10.6% | 16.0% | <10.6% | 18.5% | <10.6% | 17.7% | <10.6% | 12.5% |
| **Scheduled service hours delivered** | 98.5% | 97.4% | 98.5% | 94.3% | 98.5% | 95.5% | 98.5% | 97.7% |
| **On Time Performance** | 85% | 56% | 85% | 54% | 85% | 56% | 85% | 48% |
| **Percentage of Muni bus trips over capacity AM/PM peak** | <15% | 11.3% | <15% | 14.7% | <13% | 5.6% | <13% | 0.1% |

Source: San Francisco Municipal Transportation Agency
* Excludes Apr-Sep 2020 data

## 4.6 Work Program Items

Work program items consist of those intended to improve the City's performance monitoring as well as initiatives targeted at improving system performance. Transportation Authority work program elements intended to continue and enhance performance monitoring include:

- Monitor CMP network speeds and LOS in Spring 2023.
- Collect vehicle, transit, pedestrian, and bicycle count information to understand longitudinal trends in demand.
- Update the COVID-Era Congestion Tracker (covid-congestion.sfcta.org) at regular intervals and significantly expand its network coverage to include all major arterial in San Francisco.
- Monitor transit travel times and reliability on the CMP network and Muni Rapid Network, and work with SFMTA to further develop and establish regular spatial reliability data reporting.
- Monitor transit coverage metric and develop an interactive visualization for it.
- Work to include transit ridership in future monitoring results in order to estimate person-throughput on the CMP network.
- Coordinate with MTC to implement Continuous Travel Diary Survey Program that would provide sample data each year, and report travel mode shares using 2022/2023 travel diary data collection.
- Coordinate with the SFMTA on bicycle counting and pedestrian counting projects.
- Collaborate with other City agencies to refine and standardize metrics for bicycle and pedestrian performance.

In addition, the Transportation Authority and City agencies will continue to engage in planning efforts and implement projects to improve performance of the transportation system. The San Francisco Transportation Plan, adopted in December 2013 and then updated in October 2017, focuses on prioritizing projects and programs and developing strategies to improve system performance. The Transportation Authority will, as part of its efforts to improve performance:

- Continuously improve the San Francisco Model's capability to model all modes of transportation, including bicycle and pedestrian trips.
- Continue to participate in multimodal corridor improvement efforts.

- Through a partnership with the region, counties, and Caltrans, identify and promote San Francisco's priorities for the regional freeway network. Set a vision for the management of the City's freeway management through the Freeway Performance Initiative.
- Continue to participate in citywide pedestrian safety initiatives, including through the Pedestrian Safety Task Force, by coordinating with other City agencies to implement the WalkFirst investment strategy, and by supporting the City's traffic calming program.
- Coordinate with SFMTA on development and implementation of the bicycle network.
- Dedicate Prop K funds to the design and implementation of complete streets enhancements that "Follow the Paving."

CHAPTER 5

# Travel Demand Management Element

**KEY TOPICS**

- Legislative Requirements
- Legislative Intent and Application to San Francisco
- TDM Policy Framework
- TDM Strategy and Workplan
- TDM Policies, Requirements, and Programs
- TDM Studies and Plans
- Work Program

# 5.1 Legislative Requirements

The Congestion Management Program legislation[1] requires that the CMP include a travel demand management (TDM) element. TDM refers to tools and strategies that can reduce congestion and driving alone while encouraging travel by walking, bicycling, transit, carpooling, and other modes of travel. TDM can include policies, requirements on new development, and information/outreach programs designed to facilitate the use of sustainable transportation options. This chapter describes San Francisco's TDM Policy Framework, Strategy and TDM programs.

# 5.2 Legislative Intent and Application to San Francisco

The CMP legislation's requirement for a TDM element encourages local policy and programs to promote travel behavior changes to reduce congestion and associated impacts identified in the CMP.

# 5.3 TDM Policy Framework

San Francisco has several guiding policy documents that shape the development of TDM activities. These include:

**Transit First Policy.** In 1973, the City Planning Commission and the Board of Supervisors adopted the Transit First policy, giving priority to transit rather than accommodating the single occupant automobile. Over the next twenty years, Transit First has evolved into a set of policies advocating travel demand management and prioritization of alternative modes. The City's Transit First Policy is documented in the City Charter, the Transportation Element of the City's General Plan, the Planning Code, and other City ordinances.

**San Francisco General Plan.** The San Francisco General Plan includes multiple objectives relevant to TDM (included in Appendix 10). In addition, many of the city's recent area plans, including the Transbay Transit Center District Plan (2009), the Eastern Neighborhoods Transportation Implementation Planning Study (2011), the Central SoMa plan, and others, also include TDM objectives.

1 California Government Code Section 65098 (b)(3). Please refer to Appendix 2.

**San Francisco Transportation Plan (SFTP).** Every four years, the Transportation Authority updates the city's long-range transportation plan. The Transportation Authority is currently updating the SFTP, anticipated to complete in early 2022. The updated SFTP will outline how transportation funding in the city will be prioritized through 2050, with consideration for citywide goals as well as expected and potential revenues.

**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. As required by the California Clean Air Act (CAAA), the Bay Area Air Quality Management District (BAAQMD) developed and adopted a revised Plan, the *2017 Bay Area Clean Air Plan*, which provides updated guidance to San Francisco. Appendix 10 provides more details about regional TDM requirements and Appendix 11 lists the currently adopted regional TCMs, and discusses how San Francisco's congestion management strategies contribute to, or reinforce, these measures.

## 5.4 TDM Strategy and Work Plan

San Francisco is an attractive place to live, work, and play because it offers so much to such a wide variety of people. As a vibrant, busy city, San Francisco faces challenges with how to accommodate expected growth within the constraints of a world-class location that has already developed most of its available land. As the city increases in density, transportation and land-use planners are looking to make the city work better for the people who are already here as well as for those who will be here in the future. Due to the costs of building major infrastructure, San Francisco is looking to do more with our existing system, while focusing on key important projects like the Central Subway and Van Ness Bus Rapid Transit. In order to succeed, an ambitious transportation demand management program is needed to meet the challenge of maintaining mobility and access within the city.

In 2014, City agencies developed an *Interagency Travel Demand Management Strategy* outlining the city's approach to TDM, including activities related to (1) Implementing new TDM Policies, (2) Enforcement of existing policies, and (3) Developing supportive programs and services.

In 2017, city agencies developed a joint *San Francisco TDM Plan: 2017 – 2020*. This workplan, based on the 2014 strategy, identifies the policies, projects, and programs the city can implement to accomplish its TDM goals. The plan was collaboratively developed by the four major agencies that implement TDM in the city – the Transportation Authority, SFMTA, the San Francisco Planning Department, and the

San Francisco Department of the Environment. The plan identifies which agencies have the lead and support roles for element of the plan.

## 5.5 TDM Policies, Requirements, and Programs

San Francisco has a range of TDM policies and requirements to promote sustainable modes of transportation. These efforts can be broadly grouped in the following categories:

**Policy:** TDM policies, including the Commuter Benefits Ordinance and the Commuter Shuttle Policy.

**Programs for Existing Development:** TDM programs including the on-street carsharing pilot program, bicycle sharing program, residential outreach program, parking management, and others. The strategies behind these programs are described in the *San Francisco TDM Plan: 2017 – 2020*.

**Policies, Requirements, and Programs for New Development:** TDM requirements on new development, including planning code requirements, requirements in area plans and development agreements. The Transportation Sustainability Program (TSP) is the city's comprehensive effort to accommodate the transportation impacts of new growth. It consists of three components, all of which were updated or approved in the past two years:

- **Invest:** Transportation Sustainability Fee (TSF): signed into law in November 2015, the TSF invests in our transportation network by having developers pay their fair share to help offset the transportation impacts of growth created by their project.
- **Align:** CEQA Reform: in March 2016, the Planning Commission changed how the city analyzes impacts of new development on the transportation system under the California Environmental Quality Act (CEQA). These new practices better align with the City's longstanding environmental policies, such as reducing greenhouse gas emissions.
- **Shift:** Transportation Demand Management Ordinance: signed into law in February 2017, the TDM Ordinance requires new developments to provide on-site amenities that prioritize sustainable alternatives to driving. The Planning Department refined TDM Ordinance program standards in June 2018 to clarify and strengthen the TDM program based on experience from the first year of implementation.

Each of these categories of TDM requirements, policies, and programs are described in detail in Appendix 10.

## 5.6 TDM Studies and Plans

As outlined in the *San Francisco TDM Plan: 2017 – 2020*, several city agencies and departments are conducting numerous TDM activities, studies, and plans. This section identifies studies and planning efforts that were led by the Transportation Authority, completed recently, and that are relevant to TDM.

More detailed descriptions of these studies and plans can be found in Appendix 10.

**Travel Demand Management (TDM) Ordinance:** The SFMTA, City Planning Department, and SFCTA partnered to introduce TDM requirements for new developments as a part of TSP (Shift). This includes a web-based toolkit to aid developers design an appropriate TDM program using a consistent approach.

**Emerging Mobility Strategy and Pilot Framework:** The Transportation Authority worked with SFMTA to develop a set of principles to guide emerging mobility in San Francisco, focused on ensuring that new mobility technologies consider impacts on congestion, support the City's existing Transit First policy, promote equitable access, and improve safety, among other factors. The Transportation Authority is currently developing a framework to help guide potential pilot tests of new mobility technologies.

**School Access Plan:** In 2020, the Transportation Authority initiated the School Access Plan for San Francisco to recommend transportation solutions for K – 5 students and their families. Proposed solutions will focus on children and caregivers who are burdened by medium- and long-distance trips to school and afterschool activities. Solutions will seek to close equity gaps and provide sustainable transportation options to help reduce vehicle travel. The plan will build on the Transportation Authority's 2016 Child Transportation Study, which found that most parents drive their children to school and afterschool activities and that most parents are interested in alternative transportation options.

**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

## 5.7 Inter-Agency Work Program

The Transportation Authority will continue to work jointly with city partners to further transportation demand management policies, requirements, and program, including numerous efforts based on the *Interagency Travel Demand Management Strategy* and described in the *San Francisco TDM Plan: 2017 – 2020*. Specifically, the Transportation Authority will:

- Adopt the revised SFTP 2050, including components focused on Travel Demand Management.
- Support enforcement of TDM-related developer commitments and planning code requirements.
- Continue to pursue a comprehensive mobility management program on Treasure Island, including congestion pricing, parking management, and transit affordability pass development.
- Continue Environmental Review for express lanes on U.S. 101 and Interstate 280, in coordination with San Mateo and Santa Clara Counties.
- Prepare the School Access Plan to study strategies to manage medium to long-distance travel for students to school.
- Pursue funding for a study of TDM program coordination with a goal of increasing the efficiency and effectiveness of these programs.
- Complete the San Francisco Downtown Congestion Pricing Study to evaluate a current generation of cordon pricing and incentives strategies for the northeast cordon.
- Evaluate the effectiveness of individual TDM programs.
- Continue all other ongoing TDM programs and activities.
- Continue to work on regional TDM initiatives, coordinating with both regional entities (BAAQMD and MTC), and neighboring local agencies.

CHAPTER 6

# Land Use Impacts Analysis Program

**KEY TOPICS**

- Legislative Requirements
- Legislative Intent and Application to San Francisco
- Institutional Framework for a CMP Land Use Analysis Program
- Neighborhood Transportation Planning
- Transportation Impact Analysis
- Work Program

## 6.1 Legislative Requirements

The California Government Code section 65089(b)(4) requires that Congestion Management Programs (CMPs) include a program to analyze the transportation system impacts of local land use decisions. These analyses must measure impacts using CMP performance measures, and estimate the costs of mitigating the impacts.

The CMP legislation also requires the Transportation Authority, as the Congestion Management Agency, to "develop a uniform database on traffic impacts for use in a countywide transportation computer model…" that will be used "to determine the quantitative impacts of development on the circulation system…" (California Government Code section 65089(c)). The database must be consistent with the modeling methodology used by regional planning agencies, the Metropolitan Transportation Commission (MTC) and the Association of Bay Area Governments (ABAG). The Transportation Authority's GIS database, including ABAG Projections data, updated CMP networks, and numerous other data items (such as roadway level of service, transit ridership, travel behavior survey results, etc.) constitutes the uniform database for San Francisco. In addition, the Transportation Authority has an activity-based travel demand forecasting model used in combination with the uniform database. This is further detailed in Chapter 8 and Appendix 21.

In September of 2002 the legislature passed SB 1636, which is intended to "remove regulatory barriers around the development of infill housing, transit-oriented development, and mixed use commercial development" (65088(g)) by enabling local jurisdictions to designate "infill opportunity zones." These zones (IOZs) are defined as areas with compact, transit-oriented housing and mixed use in close proximity to transit service. The CMP network segments within a designated IOZ are exempt from CMP traffic level of service (LOS) standards. SB 743 revised the definition and requirements related to IOZs, are discussed in section 6.3.4.

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. Transit priority areas are defined as areas within a half mile of a major transit stop, either existing, or planned, which in San Francisco comprises most of the city. The text of SB 743 specifically eliminates automobile delay as measured by level of service as a significant impact on the environment in transit priority areas. Parking impacts from infill development also shall not be considered significant impacts on the environment. The Governor's Office of Planning and Research identified vehicle miles traveled as the most appropriate measure of transportation impacts.

# 6.2 Legislative Intent and Application to San Francisco

As CMA for San Francisco, the Transportation Authority ensures that the City complies with CMP requirements including land use impact monitoring. The General Plan and the City Charter are the primary institutional parameters that frame the City's process for reviewing land development impacts on the transportation network. Details about the City's land use development process within this framework can be found in Appendix 12. AB 1619, passed by the California State Assembly in 1994, stipulates that the CMA should prepare any countywide transportation plan. Pursuant to a December 1994 action, the Board of Supervisors directed the Transportation Authority to prepare a countywide transportation plan, and to coordinate City Departments. In 2013, the Transportation Authority adopted a comprehensive plan, now known as the San Francisco Transportation Plan (SFTP), in December of 2013. The Transportation Authority adopted the 2017 SFTP Update in October 2017.

The Transportation Authority is nearing completion of the next update of the SFTP. An Interagency Project Charter for San Francisco Long Range Transportation Planning Program, executed in December 2015, between the Transportation Authority, the SFMTA, and the Planning Department, outlines roles and responsibilities for developing ConnectSF. ConnectSF is a multi-agency collaborative process to build an effective, equitable, and sustainable transportation system for San Francisco's future. ConnectSF has defined a 50-year vision of San Francisco's future that represents our priorities, goals, and aspirations as a city within the larger Bay Area. That vision is guiding plans for the city and its transportation system as agencies work to identify needed transit, streets, and highway improvements. ConnectSF developed a long-range vision for 2065 that serves as the underpinning of the next SFTP 2050.

Further details on the consistency of SFTP with long term strategic goals of the General Plan can be found in Appendix 12.

## 6.2.1 POLICY ISSUES IN LAND USE AND TRANSPORTATION DEMAND

### Local Transportation Impact Analysis

The CMP-based land use analysis program links the City's land development decisions to conditions on the regional transportation system. This link already exists at the regional level in MTC's Regional Transportation Plan (RTP), which links long-range planning for transportation investment with estimates of land development based on regional demographic growth and economic development.

### Uniform Methodology

The Transportation Authority, as CMA, retains its own GIS database and travel demand model to analyze transportation and provide uniform assumptions for City departments. For major land use decisions, the Transportation Authority's tools are used to assess transportation impacts and ensure that the methodology used to assess them is consistent with MTC models and ABAG data. A model consistency report is developed during each CMP monitoring cycle to demonstrate this (see Appendix 21).

The primary purpose of the land use analysis program is, therefore, to inform decisions on the supply of transportation infrastructure to the City and how the City should best spend scarce transportation dollars. This program adds no new requirements to the existing local project environmental review process, but it provides a long-term transportation investment policy context for local environmental review. It also informs decision-making in the reverse direction: as CMA, the Transportation Authority is responsible for commenting on local land use decisions and making such comments with an understanding of how land use choices will shape future transportation demand. With the passage of California Senate Bill 743 and the future use of Vehicle Miles Traveled as a primary metric for determining traffic related environmental impacts, review of land use project will be more consistent with other goals in the SFTP and related City documents.

## 6.3 Institutional and Policy Framework for a CMP Land Use Analysis Program

### 6.3.1 PROP K MANDATE

When voters approved Prop K in November 2003, they approved various policies and priorities in the Expenditure Plan designed to implement San Francisco's Transit First policy, and improve the coordination of land use and transportation. The Expenditure Plan directs the Transportation Authority to "give priority for funding to major capital projects that are supportive of adopted land use plans with particular emphasis on improving transit supply to corridors designated for infill housing and other transit-supportive land uses."

### 6.3.2 MTC/CMA TRANSPORTATION/LAND USE WORK PLANS

MTC provides the nine Bay Area CMAs with a share of regional planning funds ("3% Planning Funds") to support local and county-level planning functions established under state and federal law. These activities include the development of the CMP. The Transportation Authority focuses on the following activities to help integrate transportation and land use decisions:

- Prioritize transportation planning funds and capital investments that support coordinated land use and transportation development;

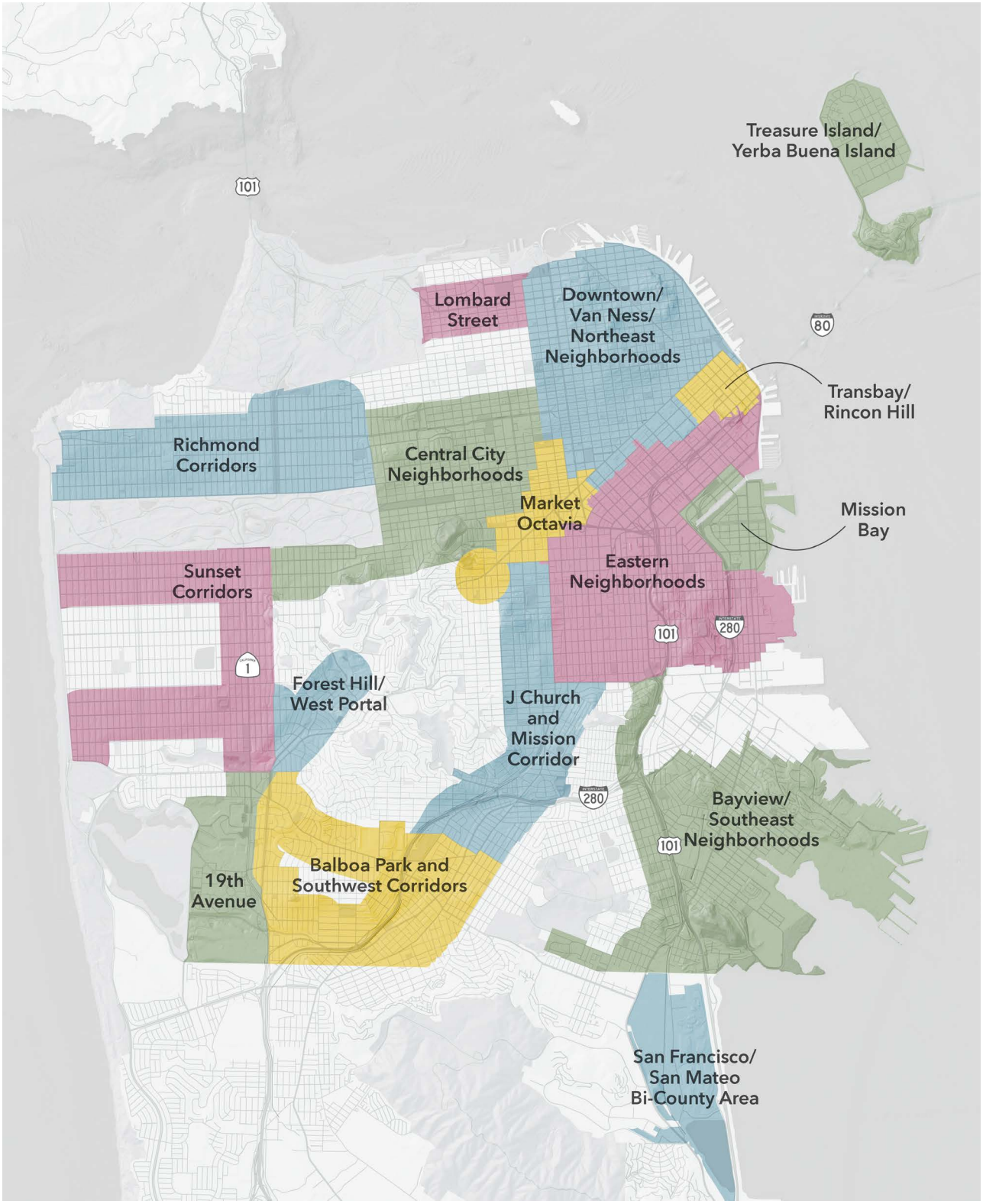
- Provide technical guidance and assistance with the planning process to partner agencies, communities, and project sponsors;
- Promote legislative activities that encourage smart growth, more sustainable transportation and development-related investment decisions by the City and developers, and also more efficient travel decisions by all transportation system users;
- Coordinate county-level input into the regional Sustainable Communities Strategy (SCS), the RTP, and related regional land use planning efforts;
- Conduct project and program delivery oversight to ensure efficient use of funds and effective project delivery.

More details about the coordination between CMA and regional land use can be found in Appendix 12.

### 6.3.3 PLAN BAY AREA AND PRIORITY DEVELOPMENT AREAS

ABAG and MTC encourage compact, transit-oriented development through the identification of Priority Development Areas (PDAs) or Priority Conservation Areas (PCAs). San Francisco has identified twelve PDAs, which collectively make up 25% of San Francisco's land area and have the capacity to take on approximately 80% of the forecast housing growth and 60% of the forecast job growth. San Francisco's PDAs are shown in Figure 6-1. San Francisco has also identified four Priority Conservation Areas (PCAs), and ABAG approved three additional regional PCAs that touch San Francisco. 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. San Francisco most recently adopted new PDA and PCA designations in December 2019.

**Figure 6-1.** Priority Development Areas in San Francisco



As a part of Plan Bay Area, the region has begun to identify more robust funding incentives for PDAs and PCAs through the One Bay Area Grant (OBAG) framework.

Details on the OBAG funding framework, and on local PDA planning projects in San Francisco can be found in Appendix 12.

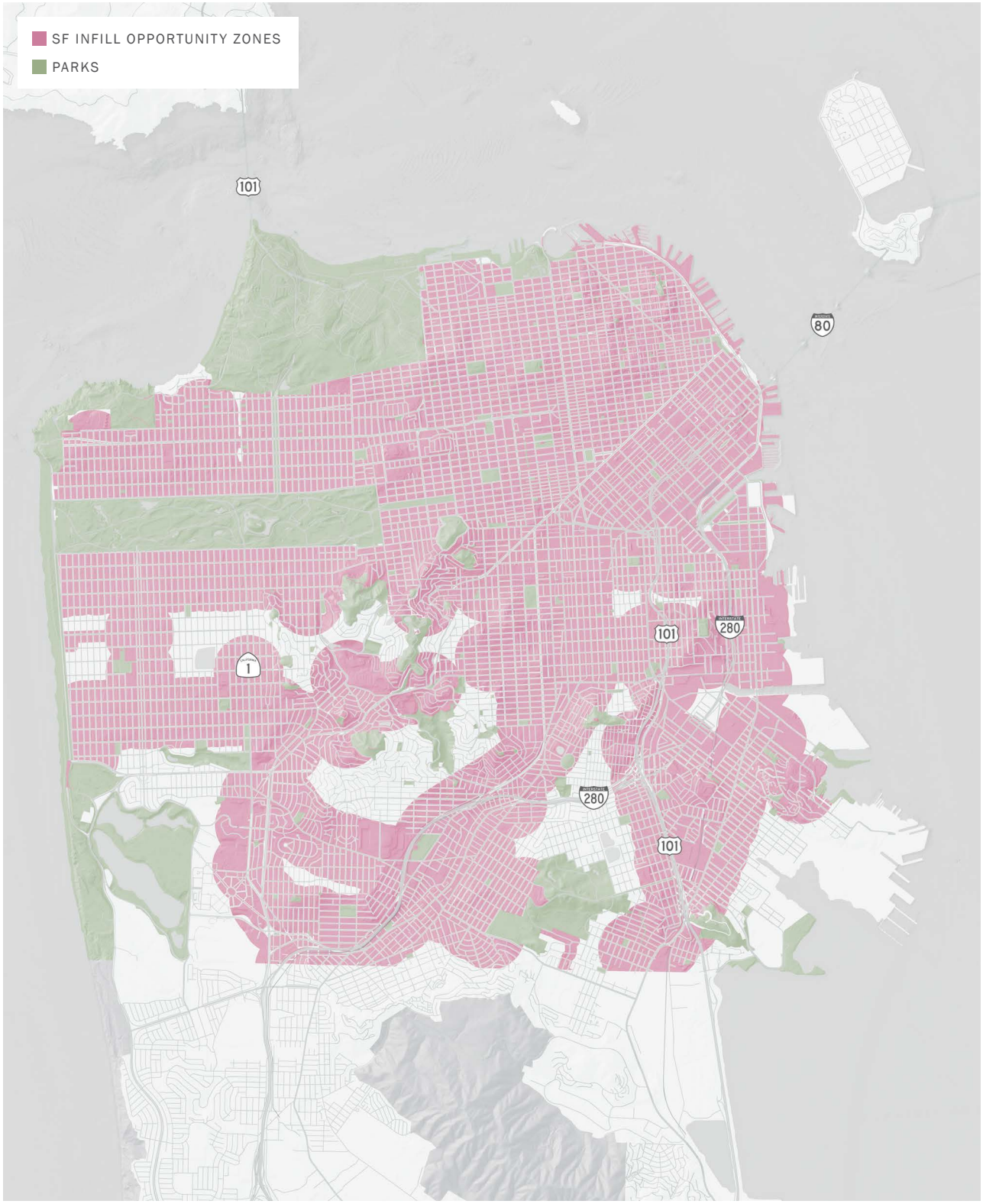
### 6.3.4 INFILL OPPORTUNITY ZONES

Senate Bill 1636 (Figueroa), passed in 2002, granted local jurisdictions the authority to designate Infill Opportunity Zones (IOZs) in areas meeting certain specified requirements. Within a designated IOZ, the CMA is not required to maintain traffic conditions to the automobile level of service (LOS) standard. The San Francisco Board of Supervisors adopted San Francisco's IOZ on December 8, 2009. Jurisdictions are allowed to designate an IOZ in any area:

- That is within a half-mile of a major transit stop or corridor that is included in the RTP;
- That is within a designated transit priority area within the regional SCS; and
- Where an IOZ would be consistent with the jurisdiction's General Plan and any applicable Specific Plan.

The Board of Supervisors designated IOZs in accordance with these criteria. The Board resolution on the IOZs can be found in Appendix 4. A map of the current IOZ areas in San Francisco is shown in Figure 6-2.

**Figure 6-2.** San Francisco IOZs



State congestion management law requires CMAs to establish vehicle level of service (LOS) standards for a designated countywide network of roadways (see Chapter 3). Within a designated IOZ, CMP automobile LOS standards are not applicable. Instead, an alternative metric can be applied for local analysis of transportation impacts. In 2016, the San Francisco Planning Commission removed LOS as a significant impact on the environment and replaced it with a vehicle miles traveled threshold for all CEQA determinations. This applies to all projects, whether or not they are within a designated IOZ.

### 6.3.5 REGIONAL LAND USE FORECASTS

For most forecasting activities, the Transportation Authority is required to use regionally-adopted projections of future Bay Area land use growth, including the distribution and nature of that growth across the region's individual jurisdictions. In 2021, ABAG adopted its most recent regional land use forecast as part of Plan Bay Area 2050, which indicates that San Francisco will absorb over 213,000 additional households between 2015 and 2050, bringing the number of households to 578,000. Employment in San Francisco is projected to increase by 236,000 jobs between 2015 and 2050, bringing the total to more than 918,000 jobs located in the city. These assumptions will underlie future CMP land use analyses. However, for the purposes of establishing consistency with regionally adopted future projections for this CMP update, the Transportation Authority will continue to use the prior Plan Bay Area 2040 assumptions because MTC has not yet established the numerical thresholds for demonstrating consistency with Plan Bay Area 2050 assumptions.

## 6.4 Neighborhood Transportation Planning

The Transportation Authority supports community-based transportation improvements by leading and funding neighborhood-focused transportation planning studies. These efforts help address community transportation concerns and engage community leadership in the transportation planning process, especially in underserved and disadvantaged communities. Over the last decade, the Transportation Authority, working with other agency partners, has completed several neighborhood transportation plans, many of which were funded with grants from the Metropolitan Transportation Commission's Community Based Transportation Planning (CBTP) program, which focuses planning resources in minority and low-income communities.

The Transportation Authority also manages the Neighborhood Transportation Improvement Program, a Proposition K funded program established to support community-based neighborhood scale planning efforts in San Francisco neighborhoods, especially in underserved neighborhoods and areas with vulnerable populations (e.g. seniors, children, and/or people with disabilities). The

goal of the program is help neighborhoods in each supervisorial district create a pipeline of grant-ready projects that have a high degree of community and agency consensus. Another objective of the program is to increase the capacity of neighborhoods and Community-Based Organizations (CBOs) to undertake neighborhood transportation planning.

A list of plans developed with the support of the Community Based Transportation Planning program and the Neighborhood Transportation Improvement Program can be found in Appendix 12.

## 6.5 Transportation Impact Analysis

San Francisco's approach to conformance with the CMP land use impacts analysis requirements is based on the existing process administered by the Planning Department. The Planning Department works from its Transportation Impact Analysis Guidelines for Environmental Review (see Appendix 13). In 2016, the San Francisco Planning Commission removed LOS as a significant impact on the environment and replaced it with a vehicle miles traveled threshold for all CEQA determinations. The Transportation Authority supports the Planning Department and other City agencies' evaluation of CEQA transportation impact analysis by providing data and tools to measure VMT, consistent with SB 743, for assessing transportation impacts. The SFCTA is coordinating with other San Francisco agencies to develop consistent transportation and land use impacts through several efforts including development and implementation of:

- Uniform Land Use Analysis Methodology
- Transportation Sustainability Fee
- CEQA Transportation Impact Analysis and Impact Fee Mitigation Reform

Detailed descriptions of these efforts can be found in Appendix 12.

## 6.6 Work Program

The Transportation Authority will continue to work jointly with City departments and regional agencies to assess the transportation impacts of planned growth, to better link transportation and land use planning, and advance climate change-related goals related to transportation. Specifically, the Transportation Authority will:

- Support the development of the regional land use model.
- Continue to develop applications of land use data within the GIS and model databases to conduct multimodal performance measurement and analysis (e.g., the relationship of land use patterns to transit usage and coverage).
- Build upon ConnectSF to identify project improvement concepts that support the 50-year vision of San Francisco's future previously adopted or endorsed by the Transportation Authority Board, the SF Planning Department, and the SFMTA Board, and include those improvement concepts in the current update of the San Francisco Transportation Plan, SFTP 2050.
- Participate in statewide, regional, and local SB 375 implementation activities by coordinating San Francisco input and advocating for San Francisco priorities in such activities as the setting of targets and preparations for the next RTP/SCS.
- Continue development of the Neighborhood Transportation Improvement Program's efforts to support planning and capital projects.
- Coordinate with city partners to regularly update the Transportation Investment in Growth Strategy (currently being updated for December 2021), to show how the city can accommodate equitable and affordable housing growth around strategic transportation investments.
- Continue to review and provide technical support to ongoing area plans and land use studies under development, including PDA projects, on an as needed basis.

CHAPTER 7

# Capital Improvement Program

**KEY TOPICS**

- Legislative Requirements
- Relationship to Other Plans
- Relationship to City Department Activities
- Funding and Programming
- Amendment
- Project Delivery

# 7.1 Legislative Requirements

California Government Code 65089(b)(5) requires that the CMP contain a seven-year Capital Improvement Program (CIP), developed by the Congestion Management Agency (CMA), the Transportation Authority for San Francisco, to maintain or improve the transportation system performance measures established in the CMP, and to address impacts on the regional network, as identified through the land use impact analysis program.

# 7.2 Relationship to Other Plans

## 7.2.1 REGIONAL TRANSPORTATION PLAN AND COUNTYWIDE TRANSPORTATION PLAN

The CMP statute requires that each CMP be consistent with the long-range Regional Transportation Plan (RTP), 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 CIP is intended to serve as a short or medium-range implementation vehicle for investment priorities as prioritized in the long-range plans.

Additional details on the RTP and SFTP can be found in Appendix 15.

## 7.2.2 PROP K AND AA EXPENDITURE PLANS

Prop K extended San Francisco's existing half-cent sales tax for transportation and adopted a new 30-year Expenditure Plan. The 30-year Expenditure Plan directs $2.35 billion (in 2003 $'s) to a list of transportation projects that were developed through the first SFTP. In 2010, San Francisco voters approved Prop AA, authorizing an additional $10 vehicle registration fee on motor vehicles registered in San Francisco. Prop AA revenues fund projects in a 30-year Expenditure Plan and are meant to complement Prop K funds.

## 7.2.3 BAY AREA CLEAN AIR PLAN

The Transportation Authority ensures that the CIP conforms to air quality mitigation measures for transportation-related vehicle emissions, as detailed in the Bay Area Air Quality Management District's (BAAQMD) Clean Air Plan and related documents. This also raises San Francisco projects' competitiveness for external funds, since the MTC gives priority to proposed projects that support or help implement the mitigation measures outlined in the 2017 Bay Area Clean Air Plan as developed and adopted by BAAQMD. See Appendix 11 for San Francisco's trip reduction efforts in relationship to the regional mitigation measures.

### 7.2.4 OTHER CAPITAL PLANS AND SHORT RANGE TRANSIT PLANS

Each City department develops its own capital investment plans for inclusion in San Francisco's ten-year Capital Plan. In addition to the citywide Capital Plan, the SFMTA has multiple short-term and long-term processes to prioritize its capital needs, including its 2021 – 2025 Capital Improvement Program, Strategic Plan, Transit Fleet Management Plan, Short Range Transit Plan, and the 2017 Facilities Framework. Five regional transit operators that serve San Francisco also develop their own capital plans and Short Range Transit Plans: BART, AC Transit, SamTrans, Golden Gate Transit, and Caltrain. The Transportation Authority considers these plans as an input into its programming process to facilitate better coordination of San Francisco programming decisions with citywide and regional priorities in compliance with CMP requirements. Also see Section 7.3: Relationship to City Department Activities.

### 7.2.5 SAN FRANCISCO GENERAL PLAN

The San Francisco City Charter assigns responsibility to the Planning Department for consistency review of capital improvements with the General Plan. This consistency review function is incorporated into the Transportation Authority's CIP programming process. If necessary, projects in the CIP may be submitted to the Planning Department for a General Plan consistency check. However, in practice, this is not typically required as the SFTP is consistent with the General Plan.

## 7.3 Relationship to City Department Activities

Each City department or other eligible project sponsor develops its own capital investment plans. The Transportation Authority steers the overall multi-agency programming strategy and analysis of trade-offs, with a particular focus on the fund sources included in this CIP. The Transportation Authority review process, described in Section 7.5, uses information already developed by project sponsors. The most significant value added by the Transportation Authority's review process is in providing an overall context for transportation programming strategy and system performance to facilitate Transportation Authority Board decisions. Key roles and responsibilities of the City departments and the Transportation Authority in the transportation programming process are summarized below.

#### City Departments

1. Prepare plans, prioritize capital improvement programs and develop financial plans on an annual or biannual basis
2. Use financial constraints and strategies imposed by external agencies in addition to those established by the Transportation Authority and departments for various funding sources

3. Revise financial plans at regular intervals to reflect changes in project scope, budget or schedule, and changes in funding projections
4. Process CIP amendments through the Transportation Authority, and obtain Transportation Authority Board approval or administrative review
5. Check eligible project list consistency with the San Francisco General Plan before adoption by the Transportation Authority Board (performed by the Planning Department)
6. Make prioritization recommendations at the time of eligible project consistency review

### Transportation Authority

1. Develop, adopt, and update the CMP and its CIP
2. Process CIP amendments according to the established procedures
3. Provide input into the MTC, state, and federal agencies' process for the preparation and updates of the Regional, State, and Federal Transportation Improvement Programs (RTIP, STIP, and TIP) in coordination with sponsors
4. Provide Prop K and Prop AA revenue estimates and advise on financial strategies
5. Develop Prop K and Prop AA Strategic Plan and 5YPP updates to respond to revisions in departments' and other project sponsors' (e.g. regional transit operators) capital and financial plans
6. Notify outside programming agencies of decisions on CIP amendments
7. Program the Prop K, the Prop AA, 50% of the TNC Traffic Congestion Mitigation Tax revenues, and the local (40%) portion of the TFCA funds, as well as discretionary funds as directed by the MTC, state, and federal agencies

## 7.4 Funding and Programming

Listed below are major CIP funding sources administered by the Transportation Authority. Importantly, as described in the Relationship with Other Plans section, 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.

Detailed descriptions of each funding source listed can be found in Appendix 15:

- Surface Transportation Program / Congestion Mitigation Air Quality Program
- State Transportation Improvement Program
- Prop K Transportation Sales Tax
- Prop AA Vehicle Registration Fee
- Transportation Fund for Clean Air
- State Transit Assistance County Block Grant Program
- Senate Bill 1 Local Partnership Program Formulaic Shares
- Traffic Congestion Mitigation Tax

## 7.5 Amendment

The previous sections describe the central role of the CMP in establishing standards and measuring or otherwise assessing the performance of the multimodal transportation system, and the role of the CIP in helping to maintain that level of performance. Any proposed changes to CIP projects must therefore first be assessed by the Transportation Authority for potential effects on the system performance. There are two kinds of CIP amendments: policy level and administrative level. These types amendments are described in detail in Appendix 15, which also described the applicability of CIP amendments, and the amendment process.

## 7.6 Project Delivery

One of the key purposes of the CMP is to establish the link between transportation investment and system performance. Programming projects in the CIP is only half of the picture. In order to be effective, the CIP must also function as a transportation project delivery mechanism. Failure to deliver projects or delays in implementation

can affect system performance. Further, depending upon the fund source, delay in obligating funds or implementing a project can result in loss of funds to the project, to San Francisco, and/or to the Bay Area. In the long run, poor project delivery rates can influence state and federal authorization levels for transportation funding, leading to fewer resources to dedicate to maintaining and improving the transportation system.

The Transportation Authority has mechanisms in place for tracking Prop K, Prop AA, and TNC Traffic Congestion Mitigation Tax project delivery (i.e., the Strategic Plan, 5YPPs, the Portal, MyStreetSF.com, and ongoing project management oversight activities). As a CMA, the Transportation Authority continues to work with the MTC and Caltrans to monitor project delivery rates for projects programmed in the RTIP and federal TIP and serve as a resource to facilitate and advocate for San Francisco sponsors.

CHAPTER 8

# Travel Demand Model and Uniform Database

**KEY TOPICS**

- Legislative Requirements
- Legislative Intent and Application to San Francisco
- Technical Approach
- Work Programs Items

## 8.1 Legislative Requirements

California Government Code section 65089 (c), requires that each Congestion Management Agency (CMA), in consultation with the regional transportation planning agency (the Metropolitan Transportation Commission (MTC) in the Bay Area), the county, and local jurisdictions, develop a uniform database on traffic impacts for use in a countywide transportation computer model. The CMA must approve computer models used for county sub-areas, including models used by local jurisdictions for land use impact analysis. All models must be consistent with the modeling methodology and databases used by the regional transportation planning agency.

## 8.2 Legislative Intent and Application to San Francisco

Congestion management legislation was enacted in part to help transportation planning agencies identify the source of the transportation impacts of land use decisions. All Bay Area counties except San Francisco include multiple local jurisdictions each of which has authority over land use within its boundaries. The transportation impacts of decisions made in one local jurisdiction are felt across local jurisdictional boundaries. The travel demand model is intended as a technical tool to analyze land use impacts across local jurisdictions from a uniform technical basis.

As a unified City and County, San Francisco is spared the need to estimate transportation impacts across city boundaries, although inter-county impacts must still be considered. San Francisco's travel demand forecasting challenge is primarily the forecasting of travel by modes other than the private automobile, (e.g. transit, pedestrian, and cycling trips).

## 8.3 Technical Approach

The Transportation Authority continually updates and refines their travel demand forecasting model, San Francisco Chained Activity Modeling Process (SF-CHAMP). Since the creation of the original San Francisco model 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. In 2018 the Transportation Authority adopted a new demand model – DaySim – within SF-CHAMP that offers significant improvements in several areas. SF-CHAMP 6.1 includes greater temporal detail, a wider variety of activity purposes, smaller zonal resolution, a TNC mode, and the ability to test

autonomous vehicle scenarios, among other features. Since DaySim is an open-source demand model that is also used in other regional travel demand models, the Transportation Authority can benefit from improvements made by other regions. In 2020, the Transportation Authority developed CHAMP-Lite and CHAMP-Express, both derived from SF-CHAMP and designed to quickly test scenarios that vary across a subset of inputs. CHAMP-Lite was deployed to test congestion pricing alternatives in the Downtown Congestion Pricing Study, and CHAMP-Express was deployed as a tool to explore post-COVID recovery scenarios.

The Transportation Authority continues to use its Geographic Information System (GIS) database as a supplemental analysis tool for appropriate CMP purposes. The model is integrated with the Transportation Authority's GIS database. The GIS is ideally suited for the graphic display of model outputs and more detailed spatial analysis. Together, GIS and the San Francisco Travel Demand Forecasting Model can be very effective both for sketch planning and the policy-level travel demand and performance forecasting exercises associated with long-range planning. The Transportation Authority's integrated model and GIS allow the ready presentation of data using graphics and maps.

A detailed description of the SFCTA's technical approach to modeling can be found in Appendix 21.

## 8.4 Work Program Items

The Transportation Authority will continue to work collaboratively with the Planning Department, MTA, other City agencies, regional transit operators, Caltrans, and MTC to:

- Continue to apply the model to assess impacts of policy and transportation changes on local and regional trip making behavior and network conditions. ConnectSF, The San Francisco Transportation Plan, 101/280 Managed Lanes Study, the Downtown Congestion Pricing Study, the Treasure Island Mobility Management Agency Study, and other ongoing projects will depend heavily on modeling support.
- Re-estimate and calibrate Daysim choice models in SF-CHAMP using travel data collected in 2018 and 2019.
- Continue to develop the Transportation Authority's Dynamic Traffic Assignment model to expand the model's geographic scope to the nine-county Bay Area and the model's temporal range to cover a 24-hour typical weekday period.
- Continue to support the development of ActivitySim, an open-source, public agency-supported implementation of an activity-based travel demand model.

@sfcta
@sfcta
linkedin.com/company/transportation-authority
@sfcta

sfcta.org/stay-connected

1455 Market Street, 22nd Floor,
San Francisco, CA 94103
**TEL** 415-522-4800
**EMAIL** info@sfcta.org
**WEB** www.sfcta.org

**San Francisco County Transportation Authority**