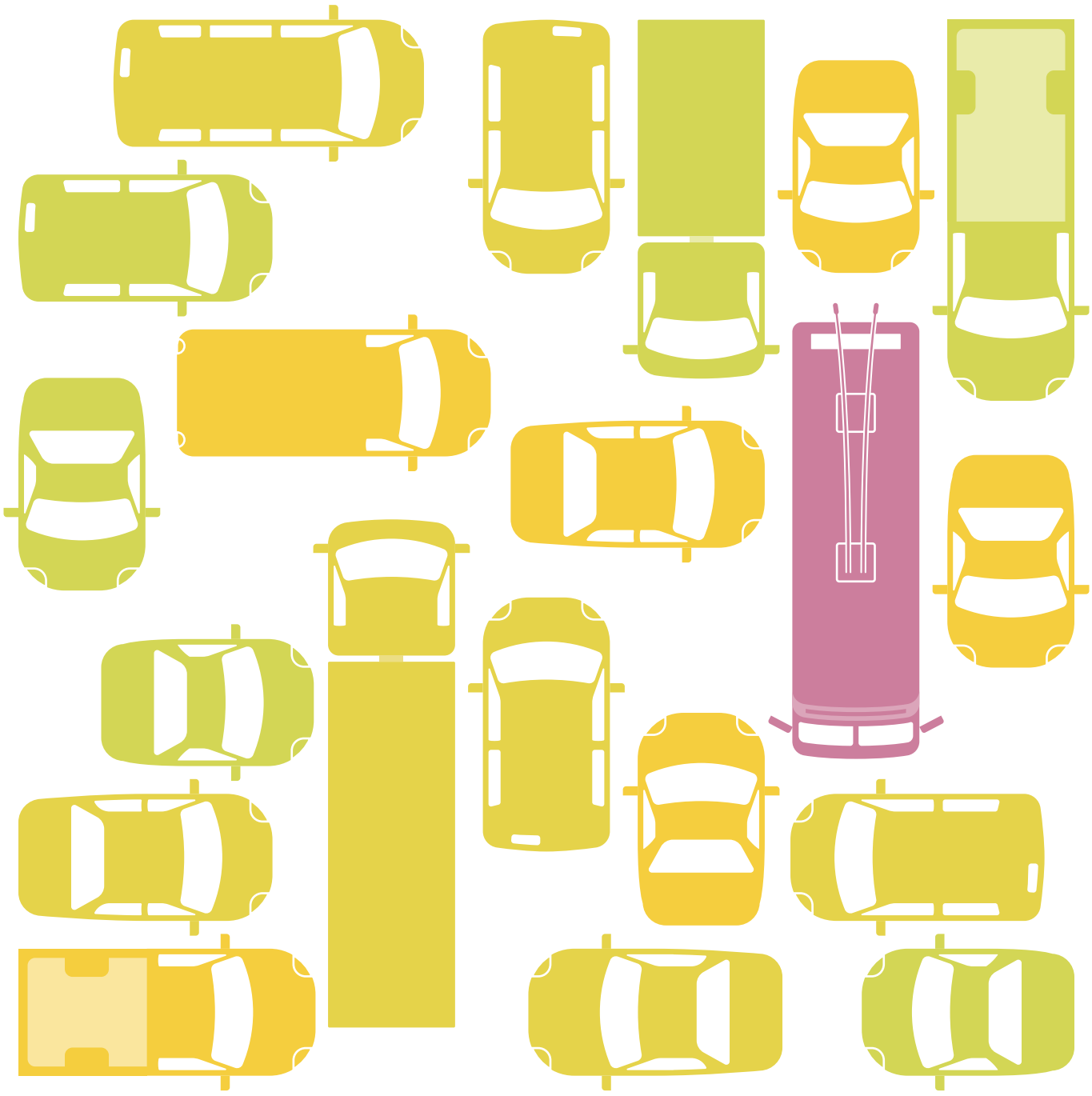

Congestion Management Program 2023

San Francisco County Transportation Authority

Draft Report: November 2023

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CONGESTION MANAGEMENT PROGRAM NOVEMBER 2023

Executive Summary

Introduction

Every two years, the San Francisco County Transportation Authority (SFCTA) prepares the San Francisco Congestion Management Program (CMP). This program is conducted in accordance with state law to monitor congestion and adopt plans for mitigating traffic congestion that falls below certain thresholds.

The Congestion Management Program (CMP) 2023 includes multimodal performance results and 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.[1] 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 accessibility place higher priority on the performance of alternative modes including transit, bicycles, and pedestrians than on private vehicle speeds.

State 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 facilitate sustainable development. The purpose of the 2023 San Francisco Congestion Management Program is 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 the two upcoming fiscal years.

As people returned to pre-COVID pandemic activity levels, traffic congestion has worsened and multimodal volumes have increased in San Francisco between 2021 and 2023, though they have not fully returned to pre-COVID pandemic (2019) levels, suggesting that some travel behavior changes induced by the COVID pandemic have persisted beyond the first 3 years of the COVID pandemic. Notably, congestion has

1 In order to reduce vehicle delay and improve LOS, without considering strategies that encourage shifts to other modes, the increased roadway capacity is the implied solution, which, in turn, has been shown to lead to more driving (induced demand).

worsened more significantly on freeways than on surface arterials since 2021. Transit ridership is still significantly lower than pre-COVID pandemic levels, with Muni, BART, and Caltrain at 61%, 38%, and 29% of 2019 (pre-COVID pandemic) ridership respectively. Muni service has recovered in 2023 to serve more than 95% of San Francisco residents within a 5-minute walk of their residence. However, with Muni's post-COVID pandemic service network changes to increase reliability and to reduce wait times and crowding under its severe transit operator shortage, the share of the population within a 5-min walk of at least one transit route with a 5-min headway continued to decline, to 27% for the AM peak and 20% for the PM peak.

The CMP multimodal counts collection effort suggests that the ongoing vehicular traffic decrease observed from 2015 to 2019 is continuing in 2023. The data also suggests that AM peak travel, which is primarily for work and school purposes, may no longer be as strongly peaked as before the COVID pandemic, possibly because fewer people are traveling to work with the rise of remote work), or the AM peak has shifted outside our data collection period of 7:00-9:00 a.m. In contrast, people travel for a wider diversity of activities during the PM peak (4:30-6:30 p.m.), resulting in a stronger recovery in multimodal volumes in the PM peak.

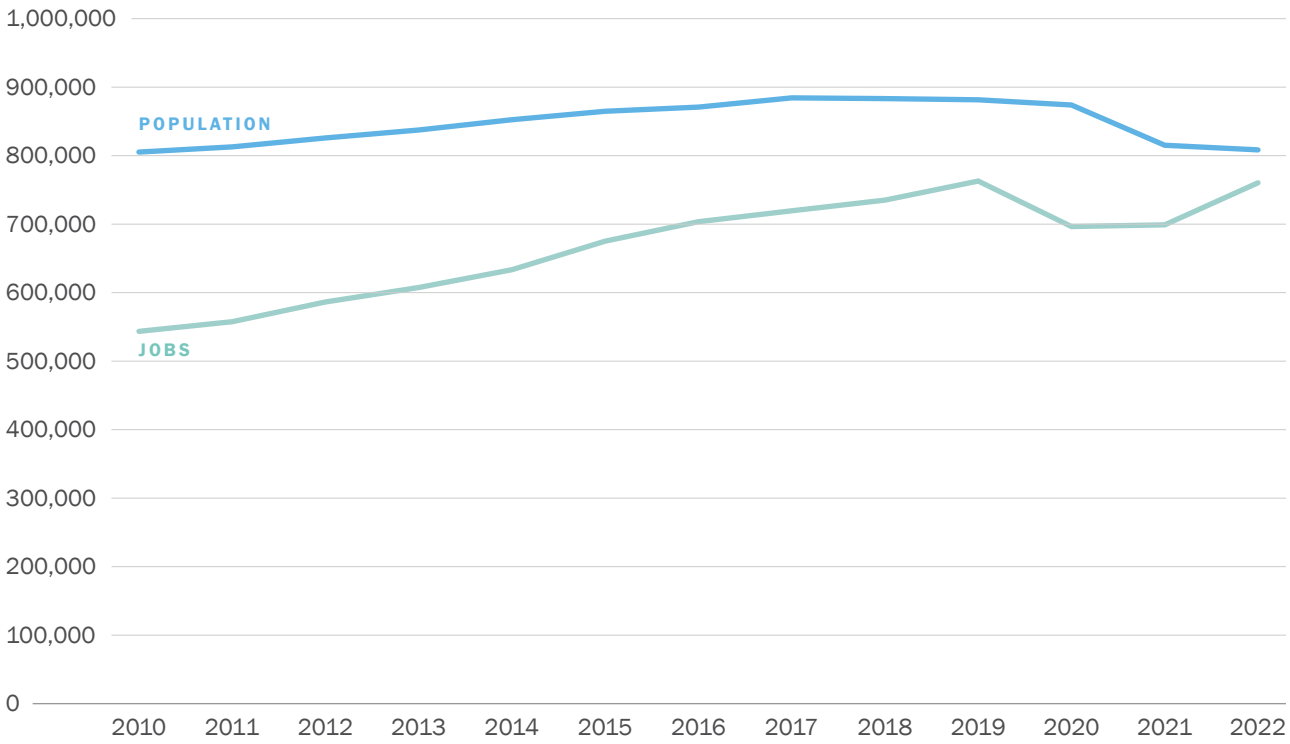
Encouragingly, the number of injury/fatal collisions involving pedestrians and bicyclists in San Francisco has remained stable at its lowest levels in a decade, even as traffic volumes have trended back up with the increase in travel activity. However, the number of injury/fatal collisions involving pedestrians and bicyclists, which dropped during the early months of the COVID pandemic, has almost returned to 2019 (pre-COVID pandemic) levels, even though traffic volumes have not returned to 2019 (pre-COVID pandemic) levels.

State of San Francisco's Transportation System

While San Francisco continues to be an employment and population hub in the Bay Area, significant changes have occurred in both San Francisco population and employment since the COVID pandemic. According to the US Census' American Community Survey, San Francisco's population declined from a peak in 2017 of about 880,000 to 815,000 in 2021 and has stabilized at around 810,000 in 2022. Employment in San Francisco peaked right before the COVID pandemic in 2019 at 763,000, and dropped for the first time in over a decade due to the COVID pandemic between 2019 and 2020. Since then employment numbers have increased rapidly back to just below 2019 numbers at 760,000 by 2022. However, while employment has increased, the COVID pandemic produced profound changes in commuting patterns that affect the transportation system performance metrics reported in this document. In 2017, only 7.2% of employed San Francisco residents reported regularly working from home, but during the peak of the COVID pandemic, this share increased to

45.6%, before declining in 2022 to 32.5% of employed residents working from home.[1] According to the San Francisco Office of Economic Analysis , San Francisco office occupancy remains at only 40%, well below pre-COVID pandemic levels.[2]

Figure 0-1. San Francisco Population and Job Trend



ROADWAY MONITORING RESULTS

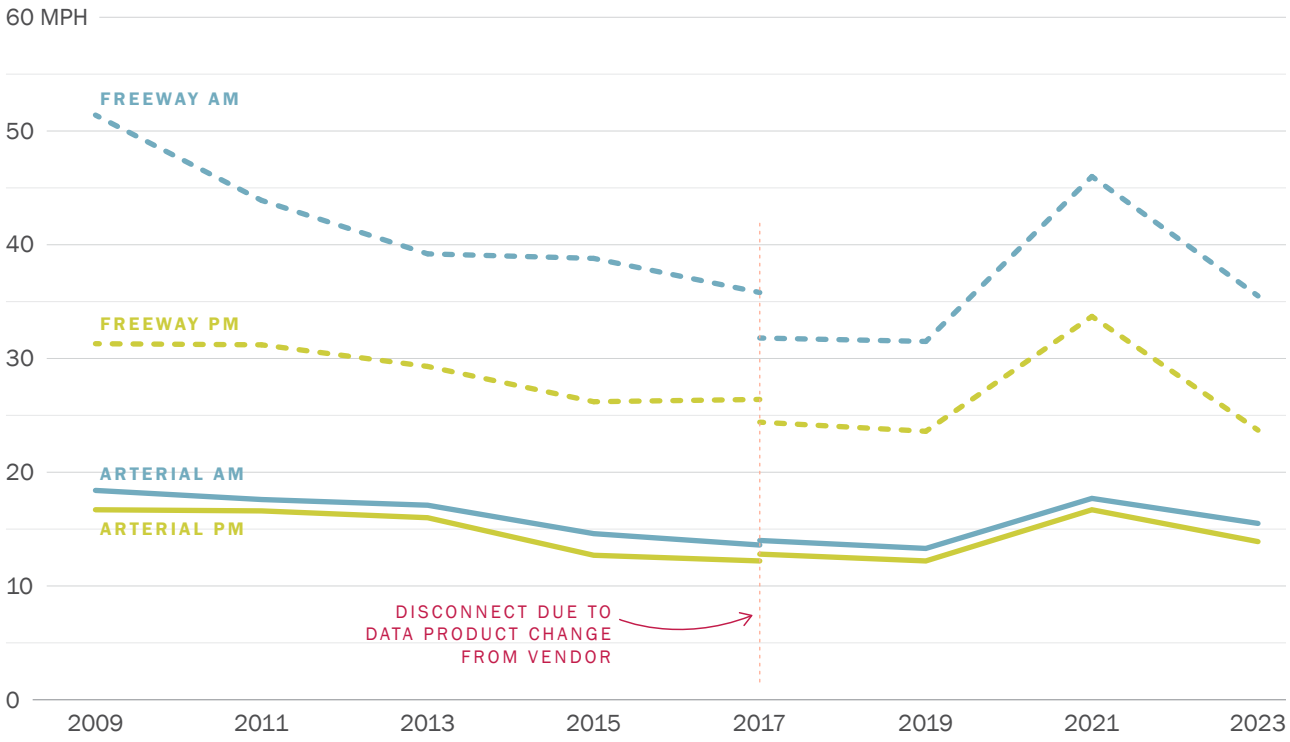
Roadway Speeds

In general, roadway speeds are lower during the PM peak than in the AM peak. Average travel speeds on the CMP network have decreased since 2021, but are still higher than the pre-COVID pandemic average speeds in 2019 for all measured time periods and road types. In comparison to 2021, average arterial travel speeds decreased 12% in the AM peak and 16% in the PM peak, and the average travel speed on freeways decreased 23% in the AM peak and 29% in the PM peak. In comparison to 2019, 2023 average arterial travel speeds are 17% higher in the AM peak and 14% higher in the PM peak, and 2023 average travel speeds on freeways are 13% higher in the AM peak and 0.4% higher in the PM peak.

1 ACS 1-Year Supplemental Estimates, Table K200801

2 https://sf.gov/sites/default/files/2023-10/Status%20of%20the%20San%20Francisco%20Economy%20August-Septermber%202023.final__0.pdf

Figure 0-2. CMP Network Average Travel Speed Trend



Note: data collected April – May each year

ROADWAY LEVEL OF SERVICE (LOS)

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.

Figure 0-3, Figure 0-4, and Figure 0-5 show PM peak LOS in 2019, 2021 and 2023. In general, for the PM peak, congestion has increased across San Francisco since 2021, but there is still less congestion than 2019. The AM peak shows similar trends. An interactive version of this map that allows users to view historical trends for the City overall, as well as for all the individual CMP segments, can be found at https://congestion.sfcta.org.

ROADWAY TRAVEL TIME RELIABILITY

While the average travel speeds and LOS provide useful insights into congestion, they do not capture a critical aspect of peoples' perception of congestion, which is the reliability of travel times. For example, a traveler is likely to perceive the congestion on a roadway where the travel is always 15 minutes differently that they perceive the congestion on a roadway where half the time the travel time is 5 minutes and the other half the time the travel time is 25 minutes. The unreliability of the travel time on this second roadway is onerous because it forces travelers to change their schedule so as to ensure that they aren't late to their destinations.

The Buffer Time Index (BTI) is a measure of the unreliability of travel time, and 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 needed if one does not want to be late more than once a month, and a lower value of BTI indicates higher reliability. For example, a BTI of 20% for a 10 minute trip requires a traveler to budget an extra 2 minutes to not be late more than once a month.

With decreased traffic congestion during the COVID pandemic in 2021, reliability improved between 2019 and 2021. However, in 2023 reliability worsened as traffic congestion increased between 2021 and 2023 as people began to return to pre-COVID pandemic activity levels. Between 2021 and 2023, the freeway BTI in the AM peak worsened from 40% to 42% and the freeway BTI in the PM peak worsened from 35% to 42% - its highest level since 2017. In contrast, there is a longer term trend of general improvement in arterial reliability as reflected in decreases in arterial BTI between 2017 and 2023 (Figure 0-6).

Figure 0-3. 2019 PM Peak Roadway Level-of-Service

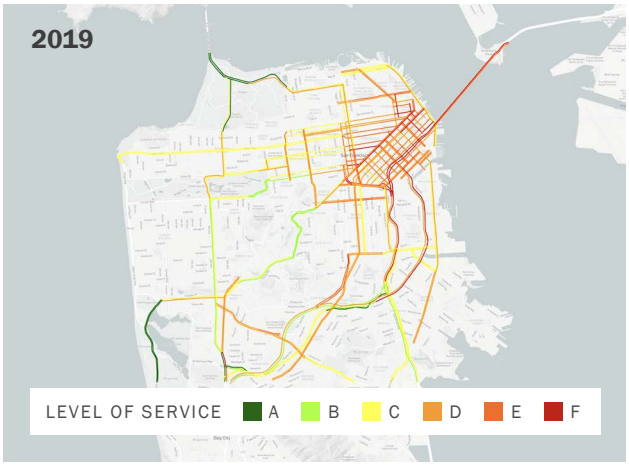


Figure 0-4. 2021 PM Peak Roadway Level-of-Service

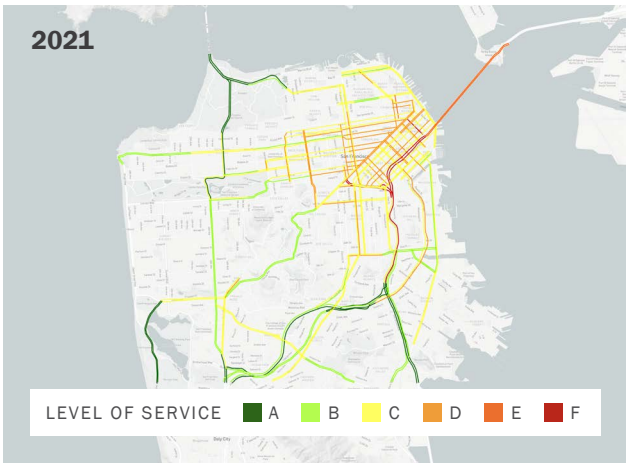


Figure 0-5. 2023 PM Peak Roadway Level-of-Service

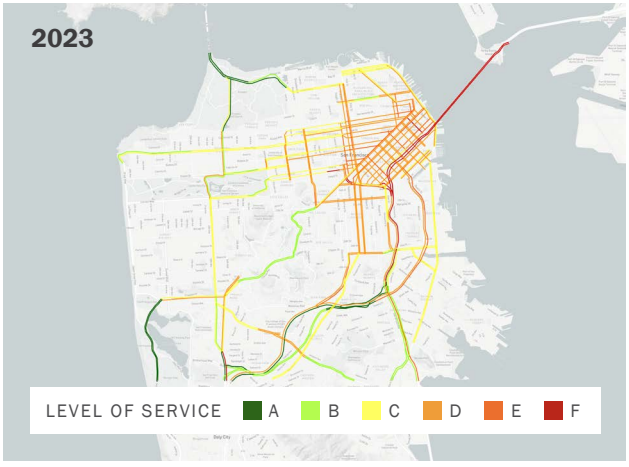
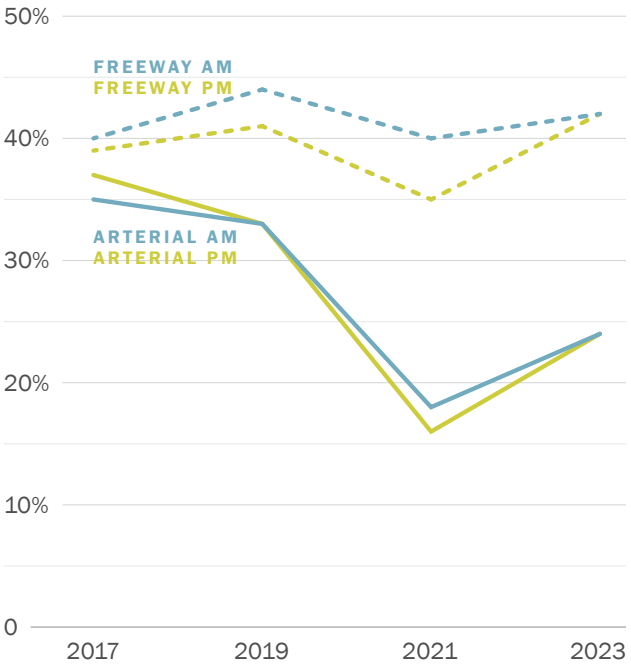


Figure 0-6. CMP Network Average Reliability (BTI) Trend

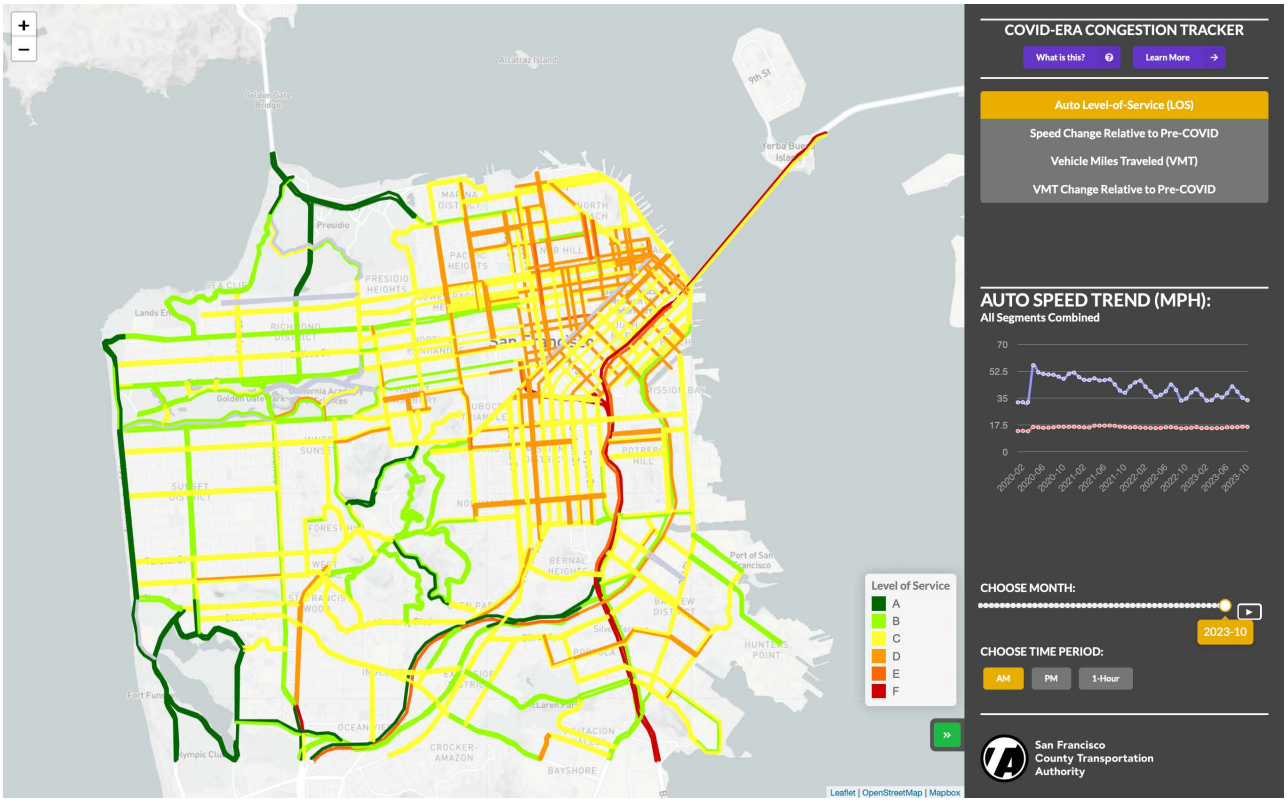


Note: data collected April – May each year

COVID-ERA CONGESTION TRACKER

Due to rapid and uncertain changes in traffic conditions during and after the COVID pandemic, the Transportation Authority maintains a tool for short-term monitoring called the "COVID-Era Congestion Tracker" (covid-congestion.sfcta.org), shown in Figure 0-7. This tool reports many of the same roadway performance metrics as reported the CMP congestion visualization, but with a much greater frequency (monthly instead of biennially) and over a shorter time frame (from March 2020 through the present instead of from Spring 1991 through Spring 2021), for a larger set of roadway segments, and at an hourly level as well as for the AM and PM peak periods.

Figure 0-7. COVID-Era Congestion Tracker

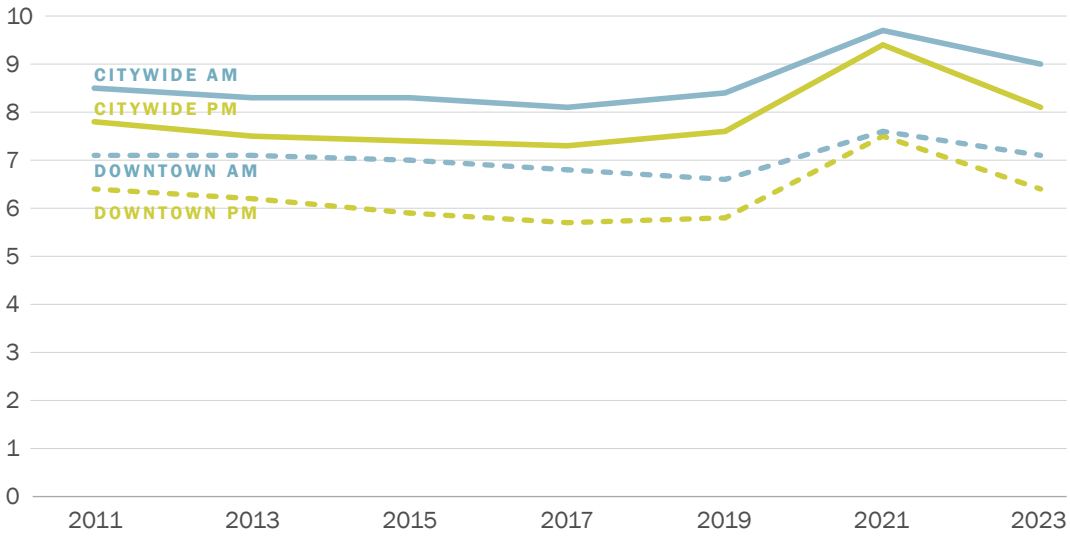


Transit Monitoring Results

TRANSIT SPEEDS

In addition to monitoring roadway speeds, the Transportation Authority also tracks surface transit (Muni bus) speeds. Similar to automobile roadway speeds, average transit travel speeds on the CMP network have decreased since 2021 as people began to return to pre-COVID pandemic activity levels, but are still higher than the pre-COVID pandemic average speeds in 2019 for both the AM and PM peak periods. However, the increase in transit speeds between 2019 and 2023 is less than the increase in roadway speeds. In 2023, AM peak transit speeds were 7% lower than in 2021, but still remained 7% higher than they were in 2019 (pre-COVID pandemic); PM peak transit speeds were 13% lower than in 2021, but still remained 7% higher than they were in 2019 (pre-COVID pandemic).

Figure 0-8. CMP Network Overall Average Transit Speeds Trend

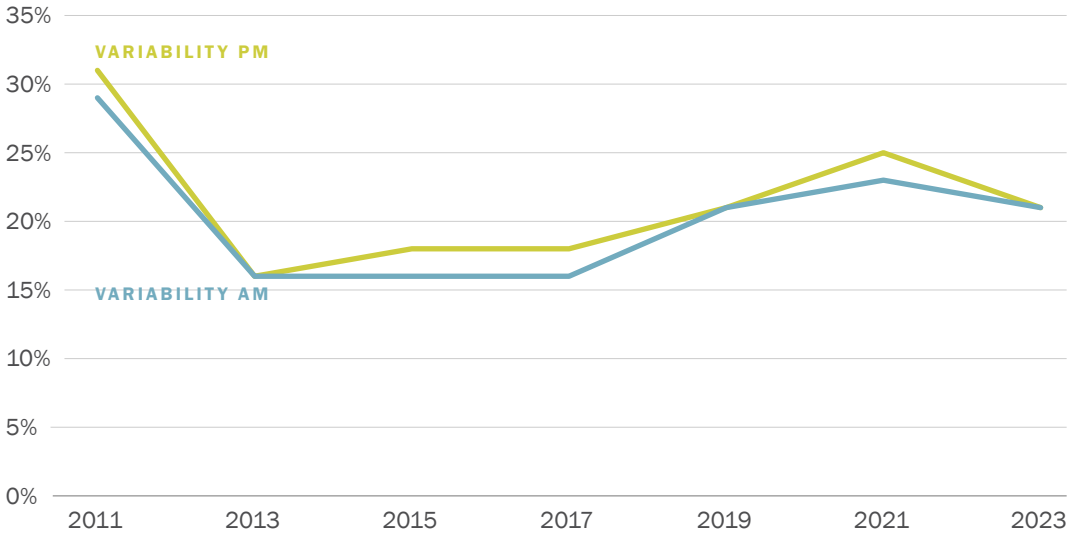


Transit Travel Time Reliability

Transit speed information is also used to calculate the coefficient of variation (CV) of speed as a measure of transit travel time reliability. The coefficient of variation (CV) is calculated by dividing the standard deviation the speed 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 improved (i.e. variability decreased) since 2021, returning back to the same levels (21%) observed in 2019 for both the AM and PM peak (Figure 0-9). With the average transit speeds in 2023 at 9.0mph (AM peak) and 8.1 peak (PM peak), a CV of 21% means that approximately 70% of the time, a 3 mile transit trip would take between 15.8 and 24.2 minutes for the AM peak, and between 17.6 and 26.9 minutes for the PM peak.

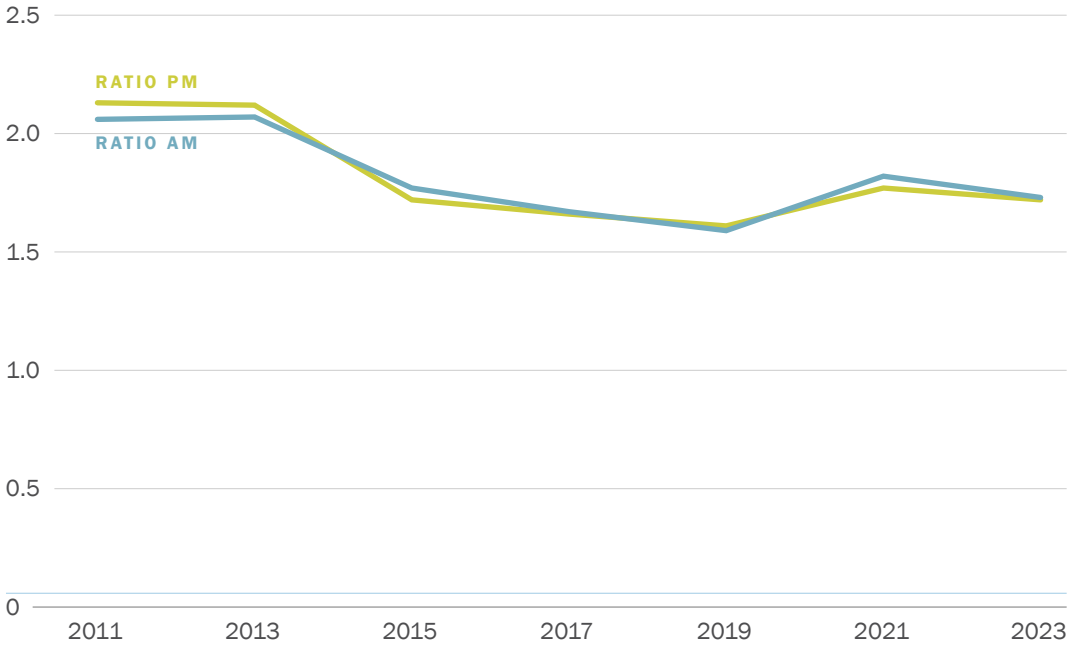
Figure 0-9. CMP Network Transit Travel Time Variability



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 is available. A ratio of 2 would indicate that, for a particular segment, on-board transit travel time is twice that of auto travel time. The ratio had been improving between 2011 and 2019, worsened during the COVID pandemic in 2021, and improved again between 2021 and 2023 (though still not back to 2019 levels) (Figure 0-10). Even though both average auto and transit speeds have decreased since 2021, transit speeds have declined relatively more than auto speeds during this time period, resulting in transit being less competitive relative to auto in 2023 than 2019.

Figure 0-10. Auto-Transit Speed Ratio



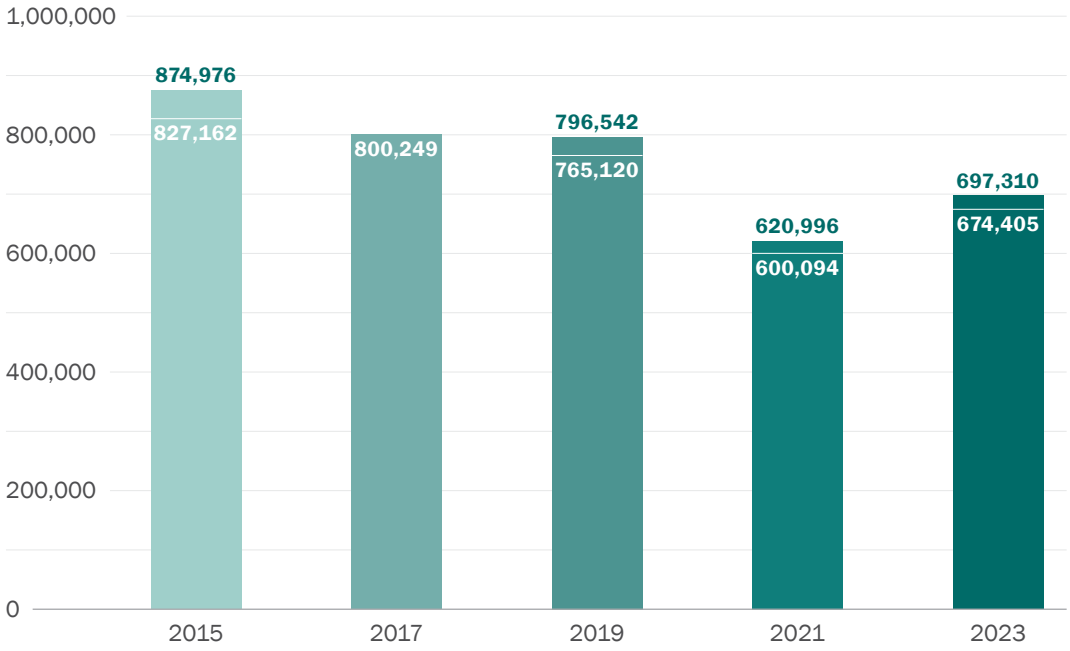
MULTIMODAL COUNTS

The City and County of San Francisco has placed a high priority on shifting travel behavior towards active transportation modes such as walking and bicycling. Multimodal counts have been collected at 29 mid-block locations (vehicle only) (Figure 0-11 and Figure 0-12) and 14 intersections (vehicle, bicycle (Figure 0-13), and pedestrian (Figure 0-14)) since 2015.

Vehicle Volumes

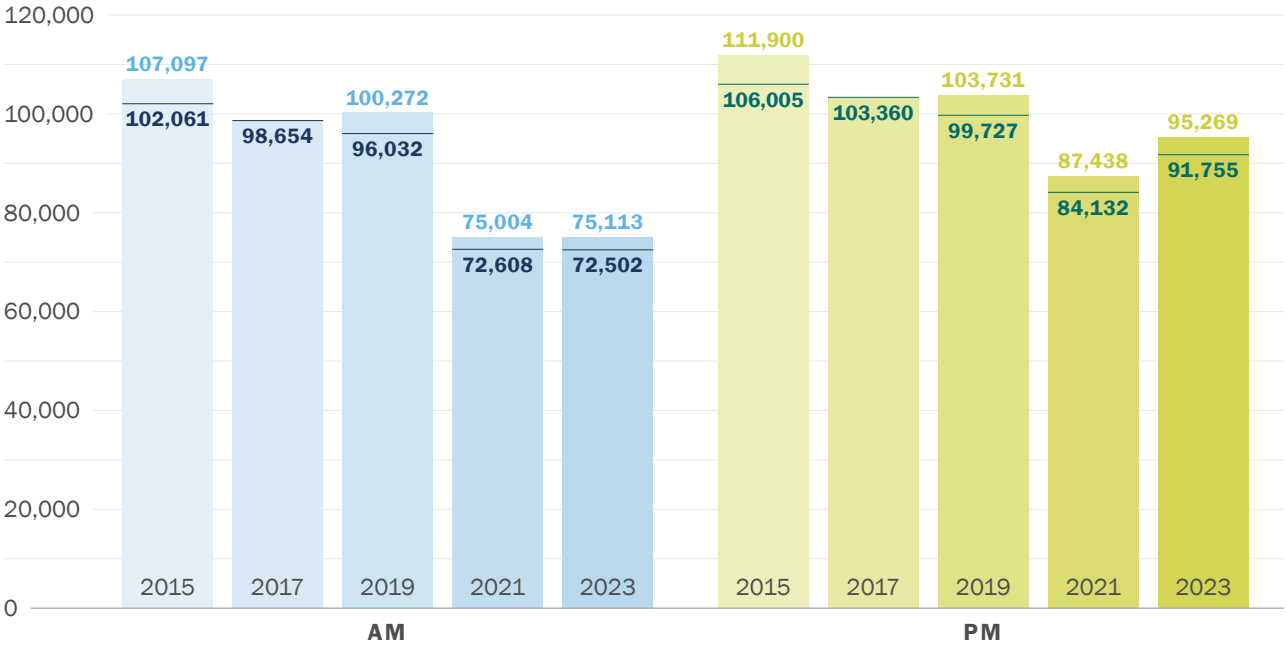
There is an increase in daily traffic from 2021 (Figure 0-11), but none of the vehicle counts (daily or AM/PM peak) show a recovery back to pre-COVID pandemic levels. The various 2023 vehicle counts stand at 75-92% of 2019 (pre-COVID pandemic) levels. The trendlines may suggest that the ongoing vehicular traffic decrease observed from 2015 to 2019 is continuing in 2023.

Figure 0-11. Mid-block weekday average daily traffic (ADT) 2015-2023



* Data collected April–May biennially at the same locations, counts shown for the bars are summed over all 29 locations and directions, whereas the white line within each bar only only shows counts summed over 28 locations and directions (excluding counts from Van Ness between California and Pine, where no data were collected in 2017).

Figure 0-12. Mid-block weekday average AM/PM peak traffic counts 2015-2023



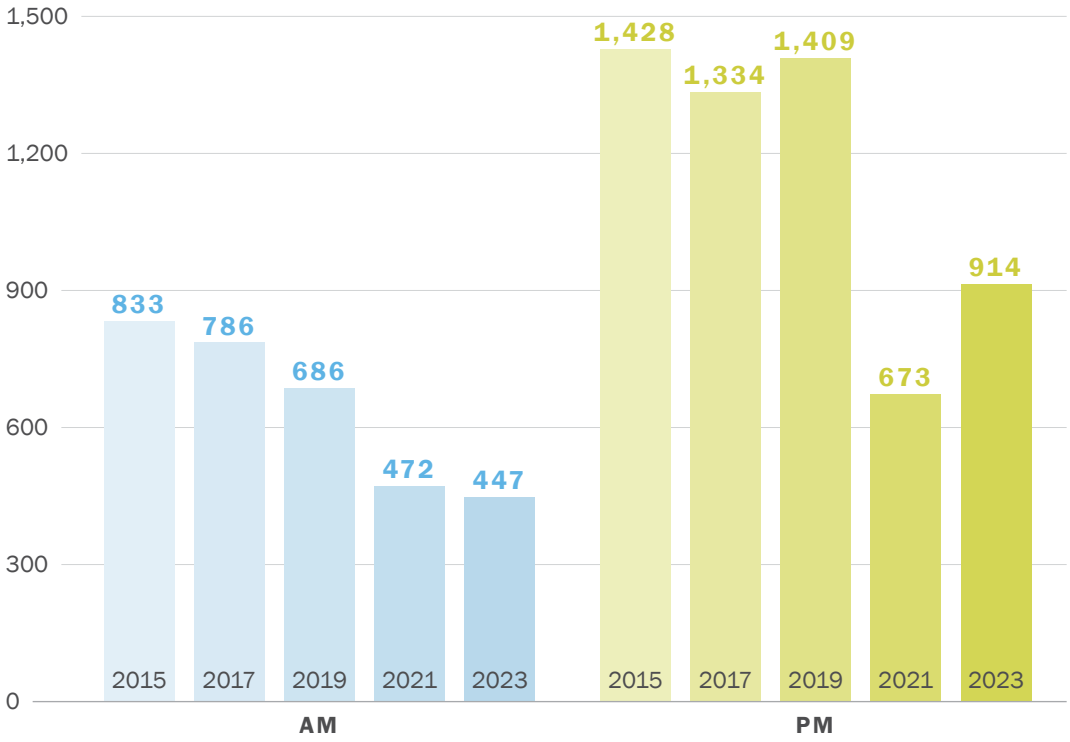
* Data collected April–May biennially at the same locations, counts shown for the columns are summed over all 29 locations and directions, whereas the line within each column only only shows counts summed over 28 locations and directions (excluding counts from Van Ness between California and Pine, where no data were collected in 2017).

Bicycle and Pedestrian Volumes

Figure 0-13 and Figure 0-14 respectively show bicycle and pedestrian counts collected by SFCTA between 2015 and 2023. At these locations, overall bicycle volumes show a recovery to 65% (for both the AM and PM peaks) respectively of 2019 (pre-COVID pandemic) levels, whereas pedestrian volumes show a recovery to 63% and 67% for the AM and PM peak respectively of 2019 (pre-COVID pandemic) levels.

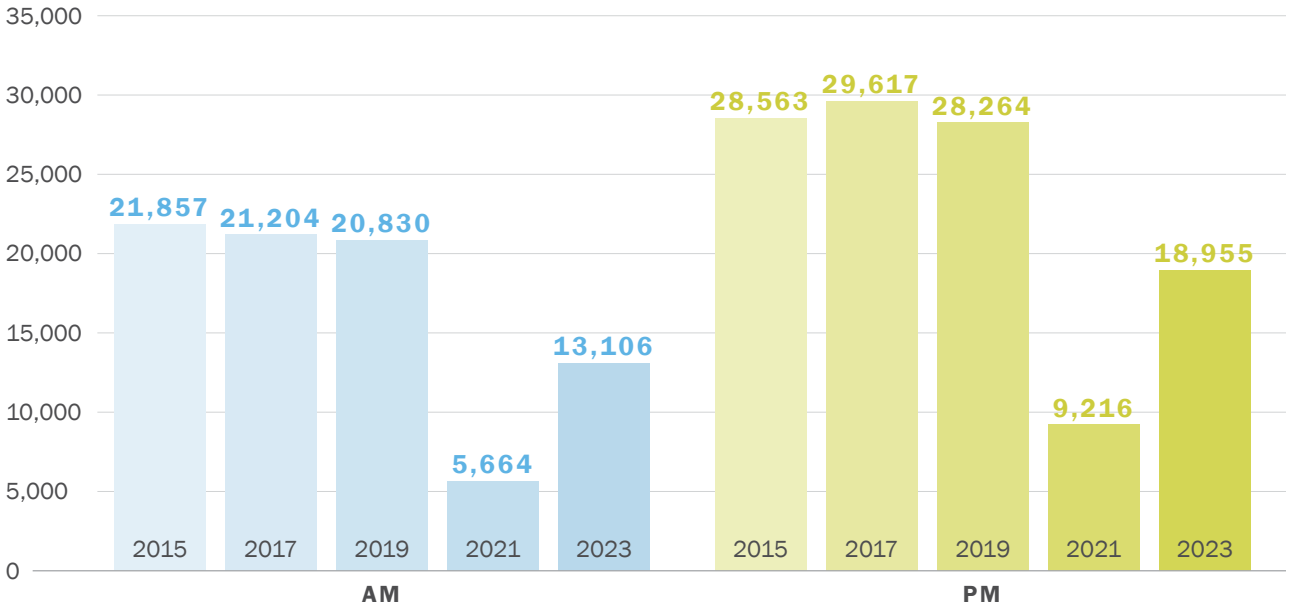
Notably, the mid-block vehicular counts and the intersection bicycle counts during the AM peak period show a flat line (for vehicles) or even a slight decrease (for bicycles) between 2021 and 2023 counts. Given the general increase in counts across the three modes between 2021 and 2023, we may hypothesize that AM peak travel, which is primarily for work and school purposes, may no longer be as strongly peaked as before the COVID pandemic, possibly because fewer people are traveling to work with the rise of remote work, or the AM peak has shifted outside our data collection period of 7:00-9:00 a.m. In contrast, people travel for a wider diversity of activities during the PM peak (4:30-6:30 p.m.), resulting in a stronger recovery in multimodal volumes in the PM peak.

Figure 0-13. Intersection single-day bicycle counts 2015-2023



* Data collected April-May biennially at the same locations, counts shown are summed over all locations.

Figure 0-14. Intersection Pedestrian Counts 2015-2021



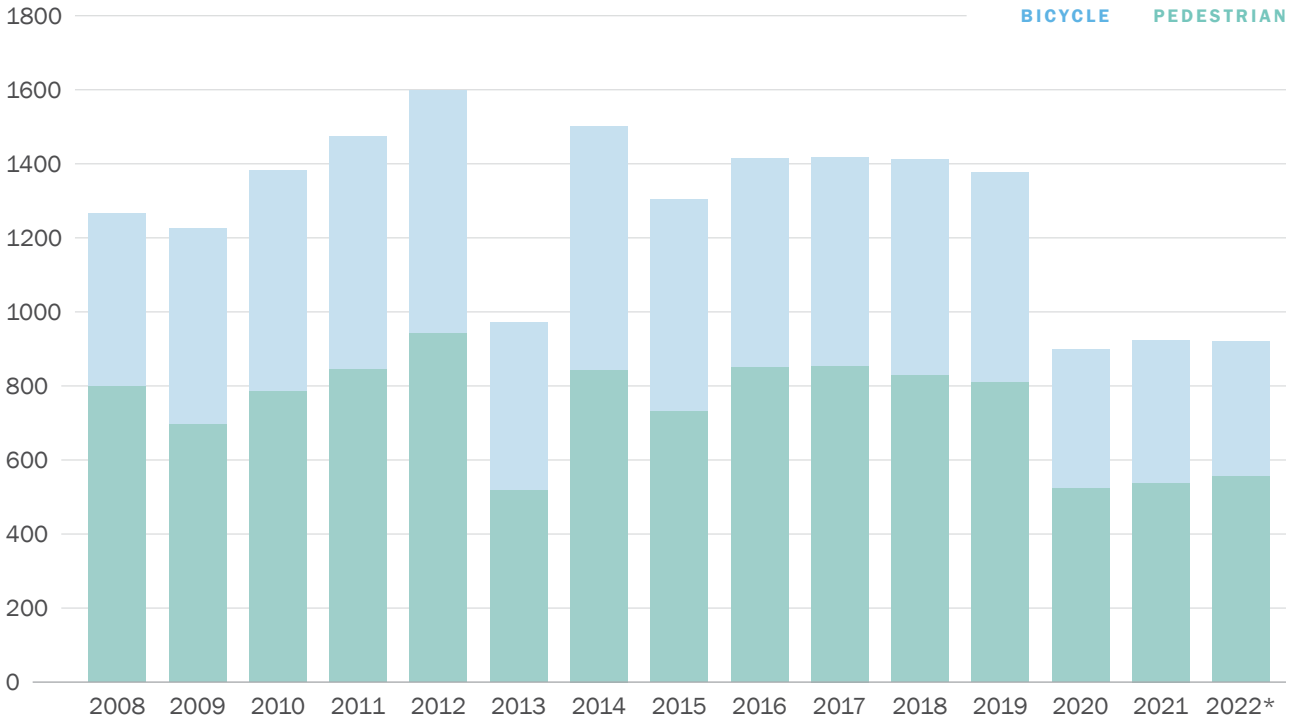
* Data collected April-May biennially at the same locations, counts shown are summed over all locations.

PEDESTRIAN AND BICYCLE SAFETY

Safety for pedestrians and cyclists are key measures of 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.

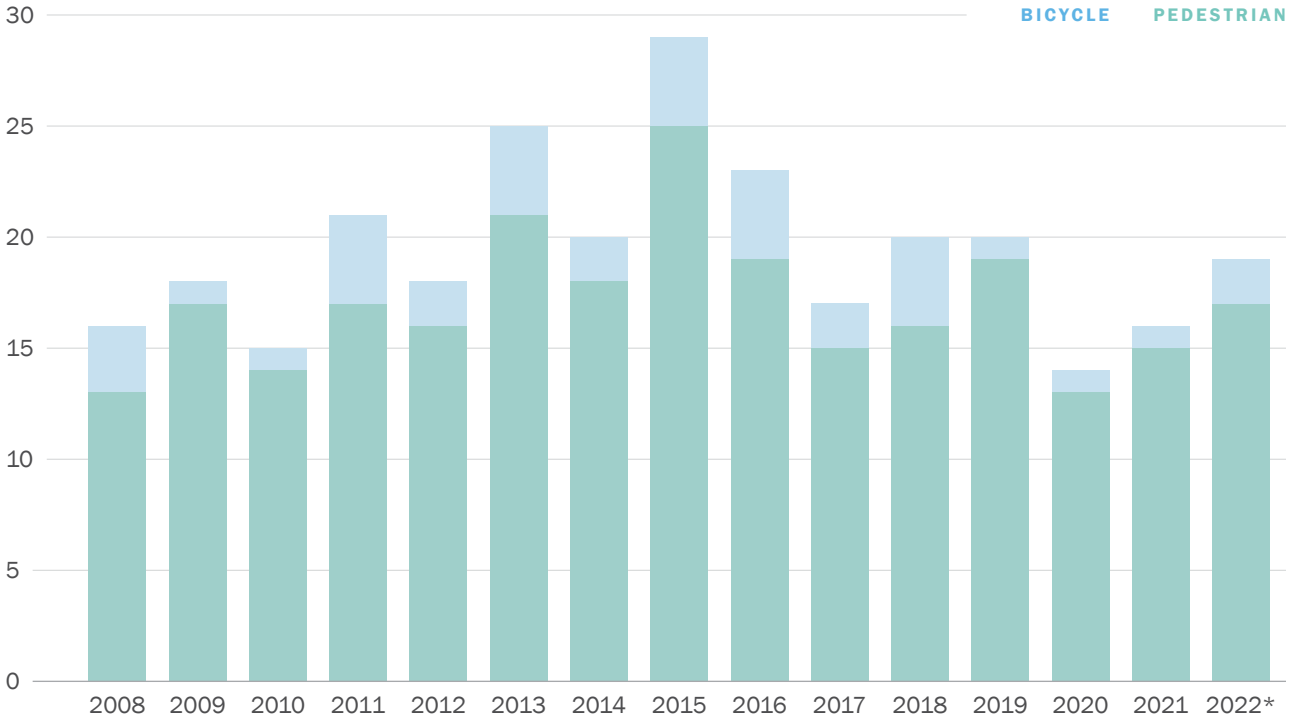
The number of injury collisions (for both collisions involving pedestrians and those involving bicyclists) dropped significantly in 2020, probably due to the substantial reduction in vehicle and non-motorized volumes in 2020 due to the COVID pandemic. This reduction in the number of injury collisions continued past 2020 to 2022, even as traffic volumes have trended back up with the increase in travel activity (Figure 0-15). A similar reduction in the number of injury/fatal collisions involving pedestrians and bicyclists happened in 2020. However, the number of injury/fatal collisions involving pedestrians and bicyclists have increased to close to 2019 (pre-COVID pandemic) levels by 2022 (Figure 0-16).

Figure 0-15. Injury Collisions Involving Pedestrians and Bicyclists in San Francisco



* provisional data.

Figure 0-16. Fatal Collisions Involving Pedestrians and Bicyclists in San Francisco[1]



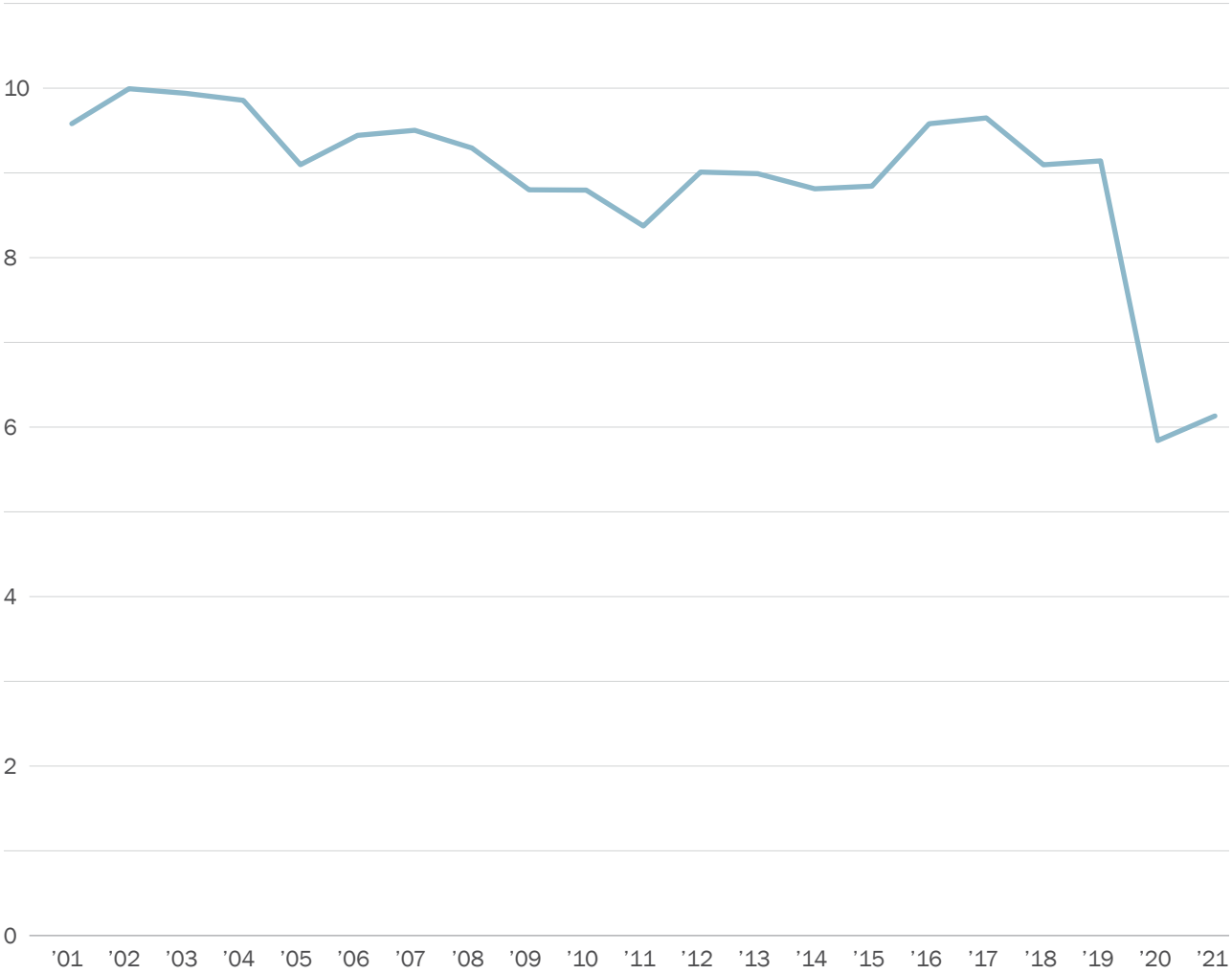
* provisional data.

Vehicle Miles Traveled (VMT)

In 2016, the San Francisco Planning Commission adopted new guidelines for evaluating the transportation impacts of new projects. Critically, environmental impact determinations are now based on vehicle miles traveled (VMT) rather than additional automobile delay as measured by level-of-service (LOS). VMT decreased by about 33% between 2019 and 2021 due to the COVID pandemic (Figure 0-17). Note that there is a two-year lag in this estimate provided by Caltrans.

1 The fatal traffic collisions data in this report is sourced from the California Statewide Integrated Traffic Records System (SWITRS) maintained by the California Highway Patrol. The San Francisco Department of Public Health (SFDPH), San Francisco Police Department (SFPD), and the San Francisco Municipal Transit Agency (SFMTA) also independently reconciles traffic deaths using Office of the Medical Examiner's and SFPD data via the San Francisco Vision Zero Traffic Fatality Protocol. This can be found at: https://sfgov.org/scorecards/transportation/traffic-fatalities .

Figure 0-17. Vehicle Miles Traveled in San Francisco

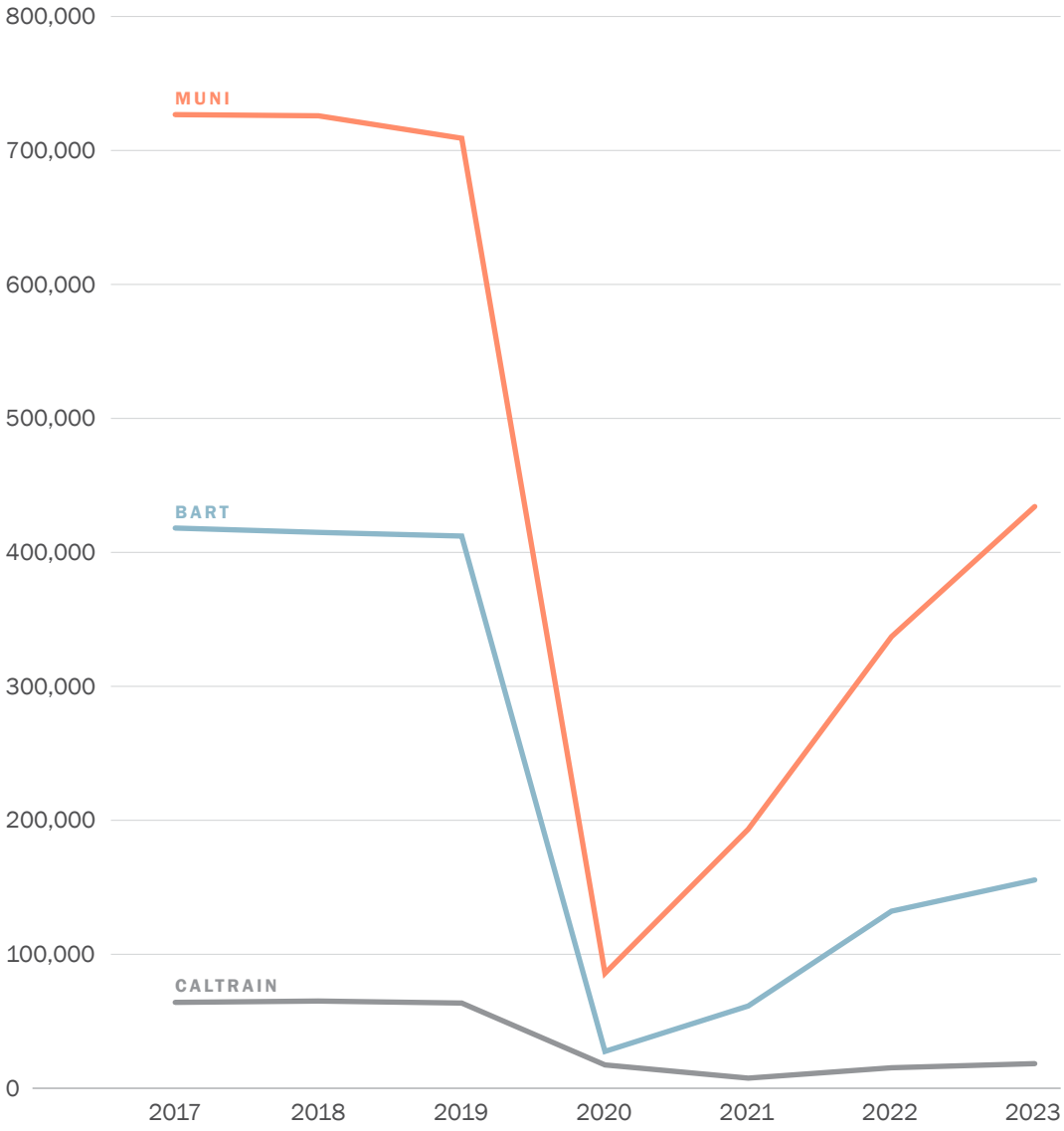


Source: Caltrans Highway Performance Monitoring System (HPMS)

Transit Ridership

San Francisco's strong backbone of local and regional transit has been key to our ability to manage congestion. Muni, BART, Caltrain, and commuter bus lines help move people into, out of, and around the city efficiently. Figure 0-18 shows recent ridership trends for the three largest transit systems serving San Francisco. Ridership on all three operators declined significantly with the spread of COVID in April-May of 2020. Since then, ridership has been gradually increasing every year, but in 2023 ridership is still significantly lower than pre-COVID pandemic levels, with Muni, BART, and Caltrain at 61%, 38%, and 29% of 2019 (pre-COVID pandemic) ridership respectively.

Figure 0-18. Average Weekday Daily Transit Boardings by Operator



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

Transit Coverage

The transit coverage metric reports the percent of San Francisco's total population and total jobs that are within a 5-minute walk of transit service. Since the significant cuts in Muni service in 2020 in the midst of the COVID pandemic, Muni service has been restored in 2023 so that now more than 95% of San Francisco residents live within a 5-minute walk of Muni service. However, the share of the population within a 5-min

walk of transit route with a 5-min headway continued to decline from 33% in 2021 to 27% in 2023 for the AM peak and from 26% in 2021 to 20% in 2023 for the PM peak (Figure 0-19 and Figure 0-20). Transit coverage in terms of access to jobs in both the AM and PM periods show trends similar to those observed in population transit coverage.

Figure 0-19. Population Transit Coverage by Service Frequency, Weekday AM Peak

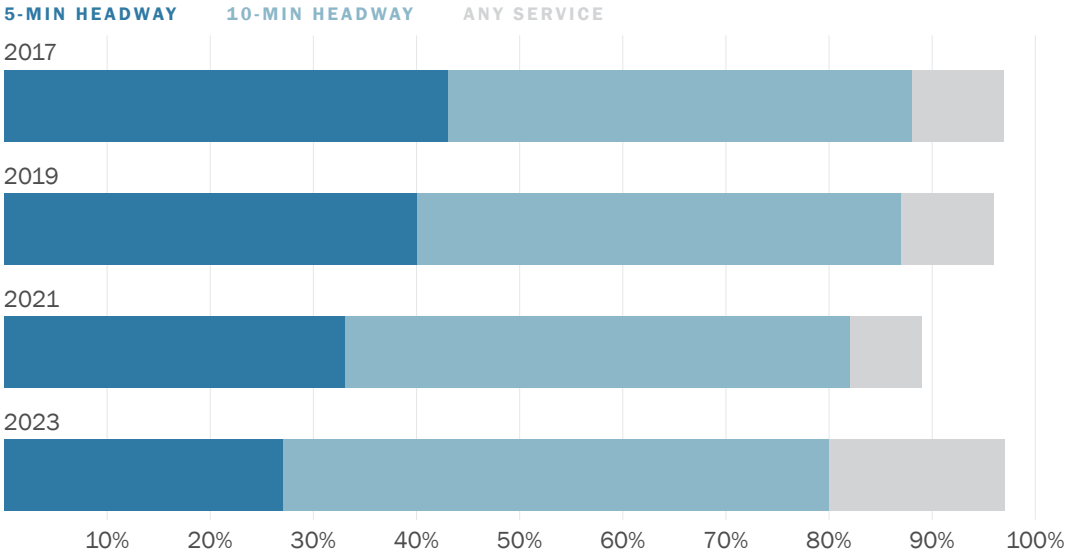
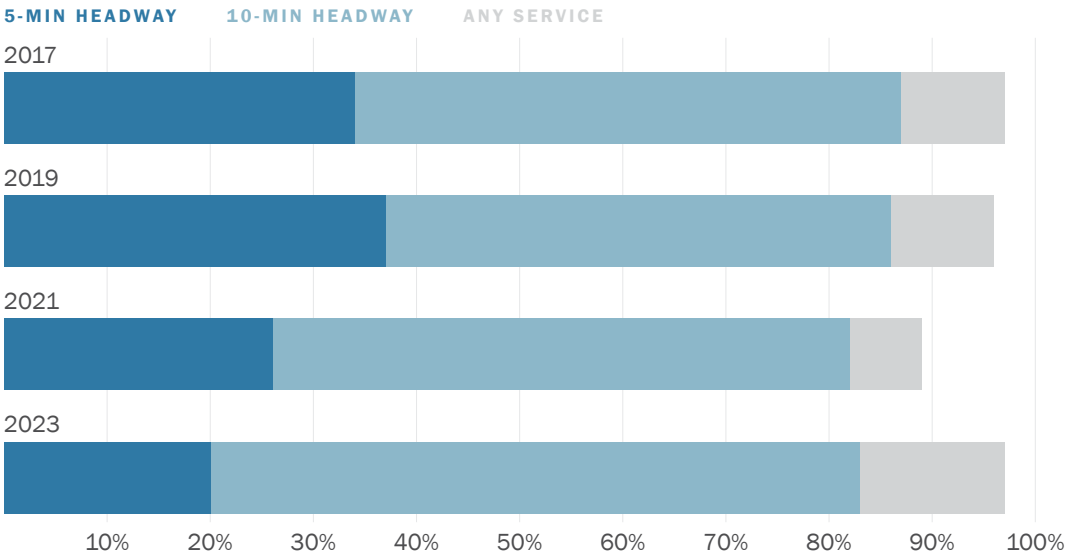


Figure 0-20. Population Transit Coverage by Service Frequency, Weekday PM Peak



What are we doing to manage congestion?

TRAVEL DEMAND MANAGEMENT (TDM)

San Francisco has a robust set of travel demand management (TDM) policy framework, strategy, and programs to systematically shift how, when, and where people travel through programs and policies. TDM will maximize the infrastructure investment priorities defined in the San Francisco Transportation Plan 2050 (SFTP2050) and can reduce congestion by shifting more trips from driving alone to walking, bicycling/rolling, transit, or carpooling. TDM can include policies, low-cost capital improvements, requirements on new development, and information/outreach programs designed to facilitate the use of sustainable transportation options.

- Coordinating transportation aspects of area plans, development agreements, and other requirements on new development, including:
  - Travel Demand Management (TDM) Ordinance
  - School Access Plan
  - Central SoMa Land Use Plan
  - Central Waterfront development projects
  - Treasure Island, Hunters Point /Shipyard, Schlage Lock, Parkmerced, Transit Center District
  - Southern Bayfront Strategy
  - Transportation Sustainability Program
- Policies and programs to manage trips in existing neighborhoods and built-up areas, including:
  - Commuter Benefits Ordinance and Emergency Ride Home Program
  - E-Bike Delivery Pilot
  - SFMTA Commuter Shuttle Policy
  - Parking Management
  - Traffic Congestion Mitigation Tax

Furthermore, San Francisco is encouraging efficient land use planning by supporting development at higher densities in areas that are mixed-use (closer to jobs and retail) and are well served by transit. Plan Bay Area 2050 identifies Priority Development Areas (PDAs) where densities and transit levels can more readily support transit-oriented development.

PLANNING PROJECTS

Connect SF is a multi-agency collaborative process to build an effective, safe, 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. The Transportation Authority is also coordinating with numerous local, regional state and Federal agencies and with the private sector to address congestion. Key initiatives include:

- San Francisco Transportation Plan
- New Transbay Rail Crossing (Link21)
- 101/280 Express Lanes and Bus Project
- Transportation Sustainability Program (including the Transportation Sustainability Fee and the Travel Demand Management Ordinance))
- Geary and Geneva/Harney Bus Rapid Transit
- Treasure Island Mobility Management Program
- Prop L Neighborhood Transportation Program (planning and capital improvement grants)
- Emerging Mobility and School Transportation sector studies

FUNDING AND DELIVERING PROJECTS

The Transportation Authority is addressing near- and long-term transportation needs for San Francisco by funding projects and programs – mainly capital infrastructure, through grant programs such as the Proposition L transportation sales tax, Proposition AA vehicle registration fee, Prop D Traffic Congestion Mitigation Tax (TNC Tax), Transportation Fund for Clean Air, and regional One Bay Area Grants (OBAG) programs, as well as coordinating with other local and regional agencies to apply for State and Federal funding to match local investments. Below are a few signature projects supported with Transportation Authority funds.

- Muni New and Renovated Vehicles
- BART New and Renovated Vehicles
- Central Subway
- Caltrain Downtown Extension to Salesforce Transit Center
- Peninsula Corridor Electrification Project

In its role as Congestion Management Agency, as part of the OBAG framework for distribution of federal transportation funds, the Transportation Authority prepared the Transportation Investment and Growth Strategy and, through OBAG Cycle 2 has programmed funds to the following projects:

- Better Market Street
- Embarcadero Station: New Northside Platform Elevator and Faregates
- Geary Bus Rapid Transit Phase 1
- John Yehall Chin Elementary Safe Routes to School
- Peninsula Corridor Electrification Project
- San Francisco Safe Routes to School Non-Infrastructure 2019-2021

The Transportation Authority is also overseeing and leading the delivery of key projects, many of which support infill transit-oriented development, including serving as co-sponsor or lead agency for the construction of:

- Yerba Buena Island Multi-Use Pathway (lead)
- I-280 Southbound Ocean Avenue Off-Ramp Realignment (lead)
- Southgate Road Realignment
- West Side Bridges Retrofit

AUTONOMOUS VEHICLES

While the CMP's focus is primarily on monitoring multimodal system performance and managing current congestion, the City must also plan for future system performance and congestion. San Francisco is a dense urban environment, and a critical challenge is how we manage our limited public right-of-way in order to maximize the movement of people and goods. While technologies such as web conferencing have led to increased levels of working from home which may help reduce peak period congestion, other emerging technologies may lead to increased congestion.

Over the past few years, the California Department of Motor Vehicles (DMV) and the California Public Utilities Commission (CPUC) have approved numerous permits for autonomous vehicles (AVs) to operate on San Francisco roadways, culminating in an August 2023 decision by the CPUC to allow two AV companies (Waymo and Cruise) to offer fared ridehailing services at all times of day across the entire City, with no limits on fleet size, not unlike the ridehailing services provided by Transportation Network Companies (TNCs) such as Uber and Lyft. Prior work by the Transportation Authority documented that between 2010 and 2016 ridehailing was responsible for approximately 50% of the increase in congestion between 2010 and 2016. As AVs

become more widely deployed, it is reasonable to expect that AV ridehail services will similarly increase congestion in San Francisco.

Monitoring the potential impact of TNCs and AVs on congestion requires that agencies such as the Transportation Authority have access to useful, timely, reliable, and unredacted data. Unfortunately, at present, the data reported to the DMV and CPUC under a variety of testing, pilot, deployment, drivered and driverless permits is too incomplete, inconsistent, and redacted to provide policy-makers with the knowledge they need to make informed decisions. Without reliable data, integration of AVs into the City's transportation ecosystem in such a way that ensures safety, accessibility and equity while not degrading system performance will be an on-going challenge.

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 the two upcoming fiscal years.

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.[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 the two upcoming fiscal years as amendments to the current cycle San Francisco CMP.

The Transportation Authority prepared most of the current cycle CMP. Some performance monitoring data are collected 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 bi-partisan 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 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),

1 See the Bibliography for the link to the document.

effective January 1, 1997, made the CMP exempt from the California Environmental Quality Act (CEQA). SB 1636 (Figueroa 2002) amended CMP requirements to allow local jurisdictions to designate Infill Opportunity Zones (IOZs). SB 743 (Steinberg 2013) further revises the definition of "IOZ" to generally encompass a larger area than that allowed in SB 1636.

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. To achieve this, the CMP law is based on five mandates:

- Require more coordination between federal, state, regional, and local agencies involved in the planning, programming, and delivery of transportation projects and services;
- Favor transportation investments that provide measurable and quick congestion relief;
- Link local land use decisions with their effect on the transportation system;
- Favor multimodal transportation solutions that improve air quality; and
- 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 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."

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. 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) outside of an infill opportunity zone. However, San Francisco's longstanding 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 SB 1636 in 2009 to designate an infill opportunity zone[1] in San Francisco 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

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 (Appendix 4). The Transportation Authority is seeking to update the IOZ in San Francisco pursuant to SB 743 before the next CMP cycle.

CEQA, following passage of SB 743 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 2021 CMP

The following sections highlight the most significant updates included in the 2023 CMP.

Chapter 4: This chapter presents the latest multimodal performance monitoring data along with updated long-term trends.

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 2021, which are discussed in this chapter.

Appendix: Many appendices containing publicly available and published information have been removed and incorporated instead as references (with URLs) in a newly included Bibliography.

1.4.4 PUBLIC INPUT

The Draft 2023 San Francisco CMP is scheduled for public review at the November 29, 2023 meeting of the Transportation Authority's Citizens Advisory Committee. The Transportation Authority Board is also scheduled to consider approval of the 2023 CMP on December 5 and 12, 2023.

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. Prop B was superseded by Prop K in 2003 and in November 2022, voters approved a new Expenditure Plan (Prop L), which superseded Prop K and extends the ½ cent sales tax for 30 years. The Transportation Authority administers, prioritizes, and programs Proposition L 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 L, 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, the San Francisco Transportation Plan (SFTP), 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 and SFTP process – are an opportunity to coordinate San Francisco's transportation planning decisions and optimize the City's investments in transportation infrastructure and services. The SFTP links 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 Transportation Authority's Prop L 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. 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 Transportation Vision for 2065 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 (adopted by the Planning Commission March 2016).
3. **Shift:** Transportation Demand Management – Require new developments to provide on-site amenities that prioritize sustainable alternatives to driving (signed into law February 2017).

2.1.3 RELATIONSHIP TO CITY AGENCIES

State law mandates that the Transportation Authority, acting as CMA, biennially determines 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 assess City departments' transportation-related actions at least biennially relative to their congestion management impacts. In doing this, 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 vision and goals for transportation and land use planning in the Bay Area.

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 where 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. 2023 Monitored Segment Miles

ROADWAY TYPE	TOTAL DIRECTIONAL MILES
Arterial	198.4
Freeway	34.9
Total	**233.3**

Performance monitoring was conducted in the current CMP cycle 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.

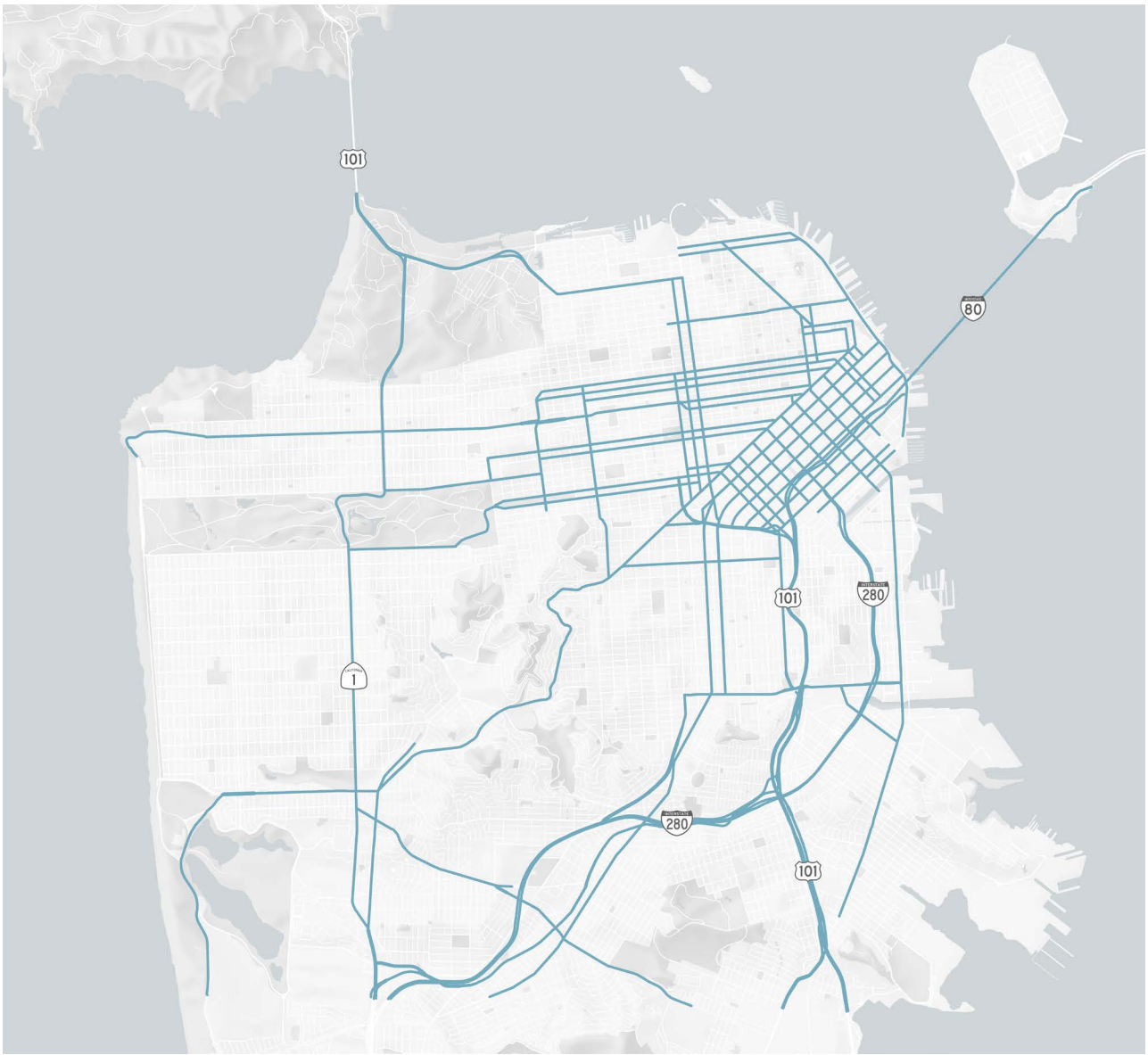
3.2.4 NETWORK CHANGES

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 current CMP cycle. 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 the current CMP cycle.

Figure 3-1. Spring 2023 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 Congestion Management Program (CMP) 2023 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 accessibility 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 Congestion Management Agencies (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 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). Senate Bill 743 (Steinberg 2013) revised the criteria to designate an IOZ, and the Transportation Authority intends to recommend the update of the IOZ within San Francisco per SB 743 before the next CMP cycle. See Chapter 6 for a more detailed description and a map of San Francisco's IOZ.

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 monitoring should be multimodal: automobile, transit, bicycle, pedestrian, and emerging modes such as micromobility, rideshare.

According to the CMP legislation, deficiencies are identified only on the roadway system. The LOS scale focuses only on automobile travel. It does not take into account the person throughput capacity of a roadway, nor does it account for other vital performance measures of roadways such as safety. A city arterial may carry the maximum number of automobiles at an acceptable speed, but if each vehicle carries only the driver, then the 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, this report 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. We include one additional roadway performance measure called the Buffer Time Index (BTI), which indicates roadway speed reliability. 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 non-automobile modes in San Francisco. The local measures are used for planning purposes and to track trends over time. Transit measures included in the CMP 2023 include transit speeds, transit-to-auto speed ratios, transit speed reliability (variability), and transit accessibility, which tracks the proportion of population and jobs that are within a 5-minute walk to a given frequency of transit service. In addition to these, we also include by reference 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 is in an Infill Opportunity Zone, 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). The Buffer Time Index (BTI), 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, was introduced in the CMP 2021 to measure roadway reliability. In other words, it is the extra time needed if one does not want to be late more than once a month.

Congestion is also an important factor affecting the performance of surface-running transit service, especially for transit operating in mixed traffic. 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 CMP 2013 after an initial study conducted as part of the CMP 2011 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 2023, 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 (244 out of 245 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 only floating car run data were available. The methodology and results of the LOS Monitoring effort are detailed in Appendix 5.

Summary of 2023 Roadway Monitoring Results

Roadway Speeds

Table 4-1 and Table 4-2 presents the change in CMP network average[1] travel speeds (calculated as time-mean speed) and reliability, between 2019 and 2023 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 Change

CATEGORY	PEAK PERIOD	TIME-MEAN TRAVEL SPEED (MPH)				
		2019	2021	2023	CHANGE FROM 2019	CHANGE FROM 2021
Arterial	AM	13.3	17.7	15.5	+17%	-12%
	PM	12.2	16.7	13.9	+14%	-16%
Freeway	AM	31.5	46.0	35.5	+13%	-23%
	PM	23.6	33.7	23.7	+0%	-29%

Table 4-2. CMP Network Average Travel Reliability Change

CATEGORY	PEAK PERIOD	BUFFER TIME INDEX				
		2019	2021	2023	CHANGE FROM 2019	CHANGE FROM 2021
Arterial	AM	33%	18%	24%	-9%	+6%
	PM	33%	16%	24%	-9%	+8%
Freeway	AM	44%	40%	42%	-2%	+1%
	PM	41%	35%	42%	+2%	+7%

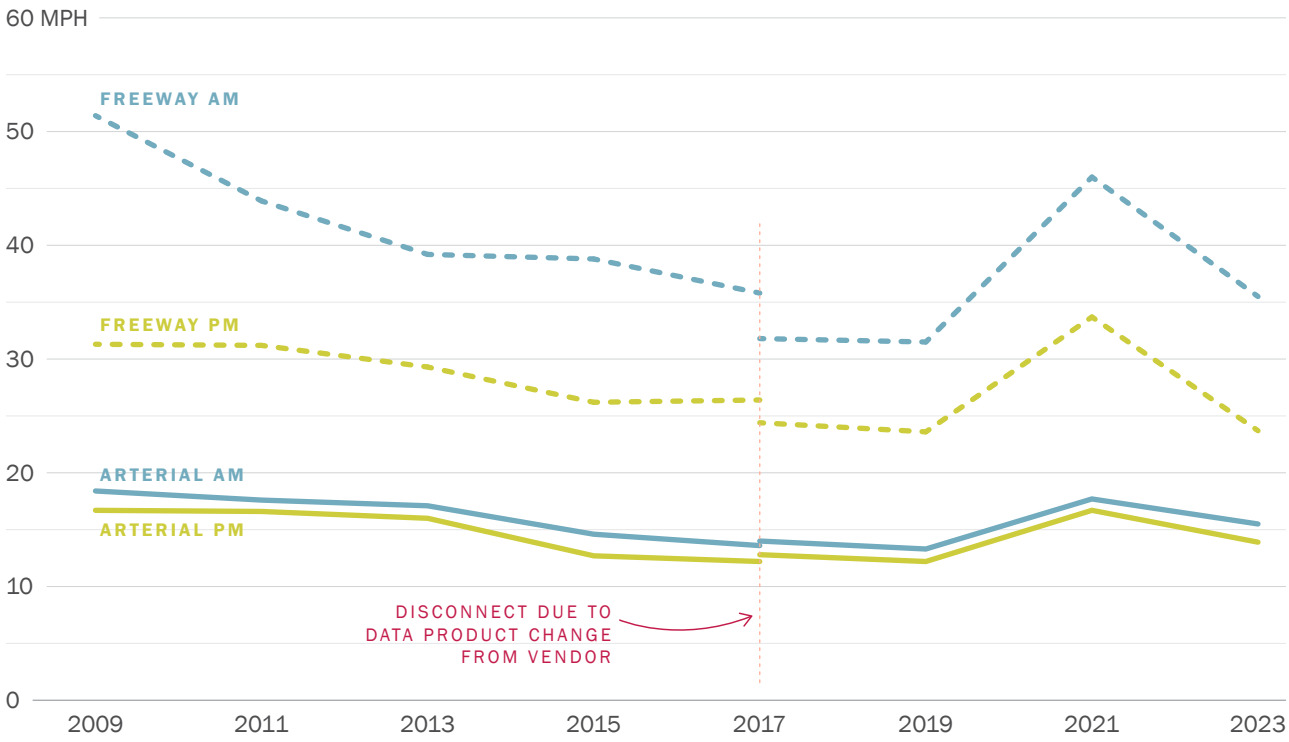
In general, roadway speeds are lower during the PM peak than in the AM peak. Average travel speeds on the CMP network have decreased since 2021, but are still higher than the pre-COVID pandemic average speeds in 2019 for all measured time periods and road types. In comparison to 2021, average arterial travel speeds decreased 12% in the AM peak and 16% in the PM peak, and the average travel speed on freeways decreased 23% in the AM peak and 29% in the PM peak. In comparison to 2019, 2023 average arterial travel speeds are 17% higher in the AM peak and 14% higher in the PM peak, and 2023 average travel speeds on freeways are 13% higher in the AM peak and 0.4% higher in the PM peak.

Overall roadway speeds had been decreasing since 2011 until the COVID pandemic. Roadway speeds increased in 2021 during the COVID pandemic, then decreased between 2021 and 2023 as people began to return to pre-COVID pandemic activity levels. However, even with this decrease in speed, 2023 peak period average speeds on arterials and freeways are still higher than pre-COVID pandemic speeds measured in 2019 (Figure 4-1).

1 Averages are weighted by the length of each CMP segment.

A significant portion of San Francisco's arterial CMP network overlaps with its Vision Zero High Injury Network (visionzerosf.org/maps-data). The city has committed to making safety improvements on every street on the High Injury Network by 2024, with the focus on slowing automobile speeds and improving street crossings (for all modes)–these have been proven to be effective tools to have the largest impact on safety on San Francisco's streets–thus helping to reduce traffic deaths and severe injuries (Vision Zero. Action Strategy 2021-2024.). San Francisco has also introduced lower speed limits on a number of streets that are designated as "safety corridors" (sfmta.com/getting-around/walk/speed-management), many of which overlap with the CMP network. These changes work to improve the safety for all road users of San Francisco's transportation system, and may be reflected in a drop in travel speeds on the CMP network.

Figure 4-1. CMP Network Average Travel Speed Trend



Note: data collected April – May each year

Figures 4-3a and 4-3b present the change in CMP average speeds between 2019 and 2023 and between 2021 and 2023. The diagonal line from the lower left to the upper right means no change in speed has been observed, with points above (to the upper-left) / below (to the bottom-right) of the diagonal indicating speed increases / decreases respectively. Most speeds have decreased from 2021 to 2023 back to 2019 speeds. Between 2021 and 2023 (Figure 4-3), most segments are below the

diagonal, including the cluster of slower speed segments (below 30mph). The absolute segment speed decreases are especially apparent in the higher speed segments as they fill out the entire lower right of the graph. On the contrary, between 2019 and 2023 (Figure 4-2), the speeds on slower segments (those below 30mph) are more clustered around the diagonal (indicating that some segments sped up while others slowed down). However, most of the faster segments have a higher speed in 2023 than 2019, as shown by the higher speed segments being mostly above the diagonal—the increased speeds are generally higher in the AM than in the PM, as indicated by the AM points being farther away from the diagonal than the PM points on the upper right of the graph.

Figure 4-2. Comparison of 2019 and 2023 CMP Segment Speeds

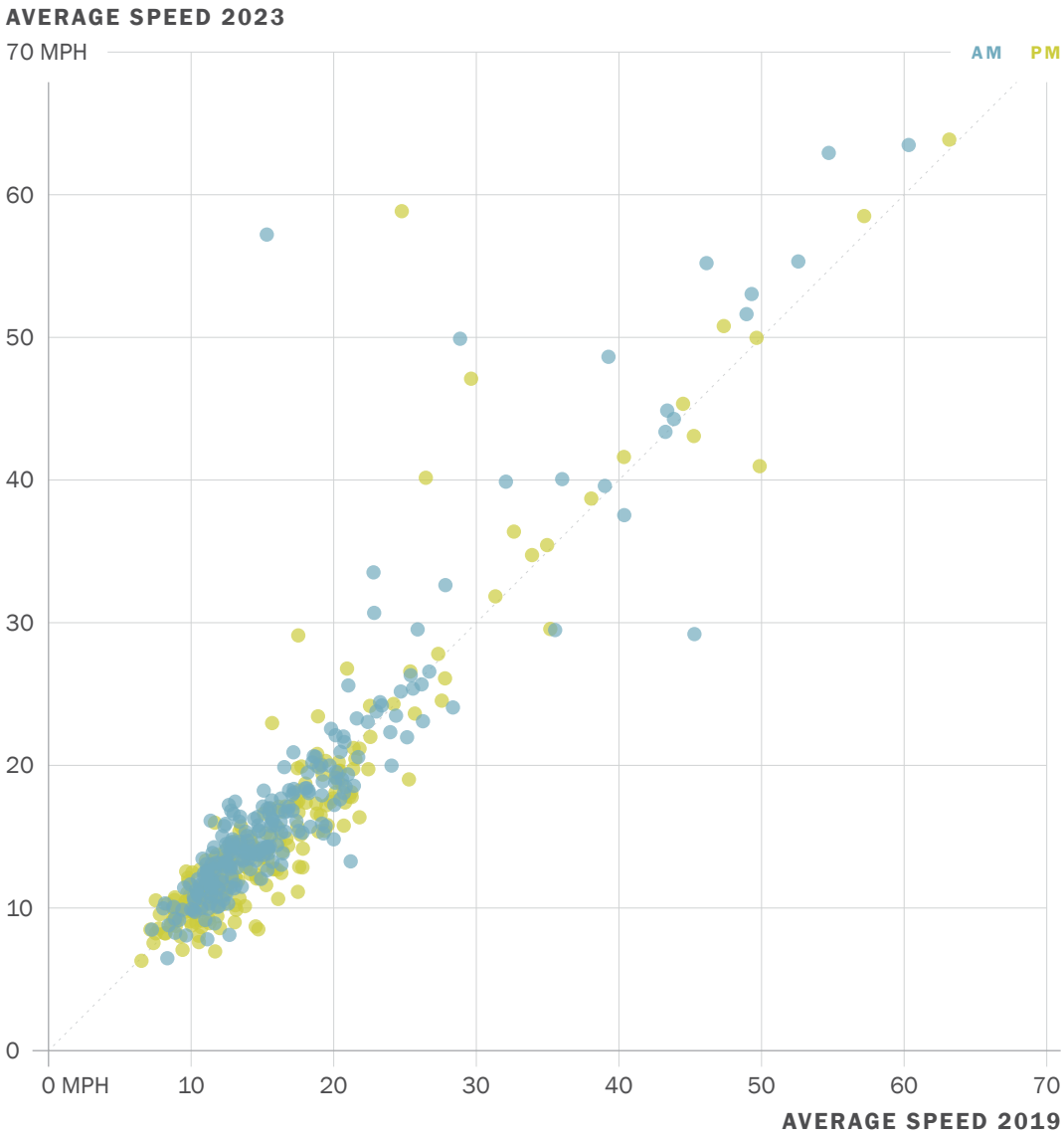


Figure 4-3. Comparison of 2021 and 2023 CMP Segment Speeds

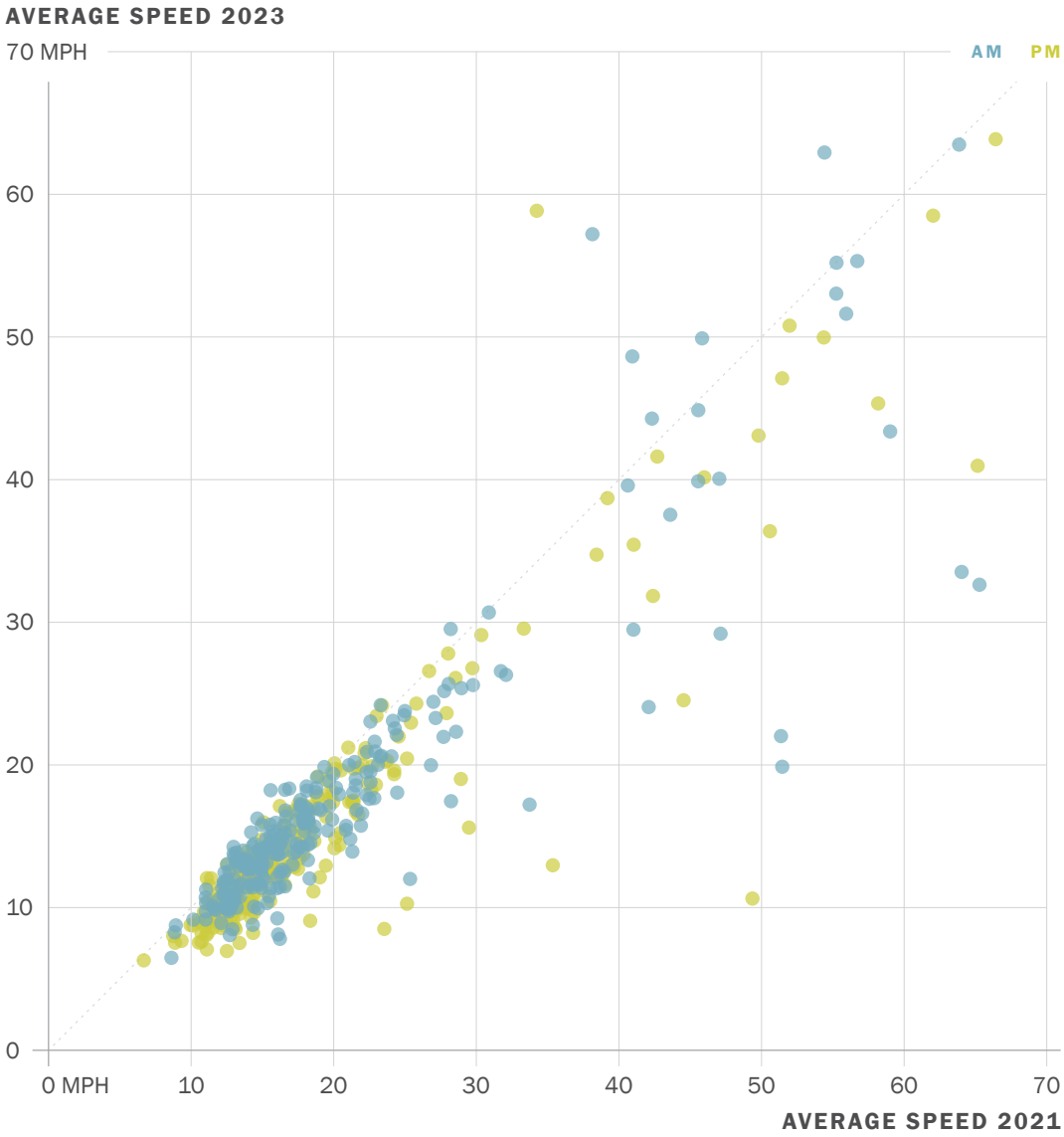


Table 4-3 and Table 4-4 identify the segments that experienced the largest percentage decrease in speed between 2021 and 2023. The 2019 (pre-COVID pandemic) speed for each segment is also included as a comparison.

Table 4-3. CMP Segments with Highest Percentage Decrease in Auto Speeds, AM Peak Period (7 a.m. – 9 a.m.)

CMP SEGMENT	FROM	TO	DIR.	2019 AUTO SPEED (MPH)	2021 AUTO SPEED (MPH)	2023 AUTO SPEED (MPH)	CHANGE FROM 2021 (MPH)	CHANGE FROM 2021 (%)
Junipero Serra	County Line	Brotherhood	N	15.4	51.5	19.9	-31.6	-61%
US-101	County Line	Cortland	N	19.0	51.4	22.0	-29.3	-57%
Junipero Serra	Brotherhood	19th	N	8.2	25.4	12.0	-13.3	-53%
Oak	Fillmore	Laguna	E	10.4	16.2	7.8	-8.4	-52%
US-101	Cortland	Monster Park Exit	S	24.2	65.3	32.6	-32.7	-50%

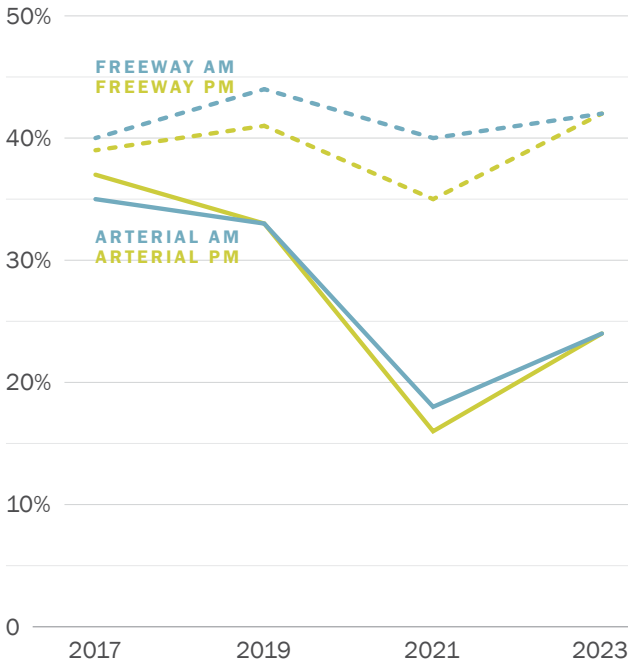
Table 4-4. CMP Segments with Highest Percentage Decrease in Auto Speeds, PM Peak Period (4:30 p.m. – 6:30 p.m.)

CMP SEGMENT	FROM	TO	DIR.	2019 AUTO SPEED (MPH)	2021 AUTO SPEED (MPH)	2023 AUTO SPEED (MPH)	CHANGE FROM 2021 (MPH)	CHANGE FROM 2021 (%)
Junipero Serra	County Line	Brotherhood	N	15.7	49.4	10.6	-38.7	-78%
US-101	Cortland	I-80	N	12.6	23.5	8.5	-15.0	-64%
I-80	Treasure Island	Fremont Exit	W	17.5	35.4	13.0	-22.4	-63%
Junipero Serra	Brotherhood	19th	N	9.2	25.1	10.3	-14.9	-59%
6th St	Market	Brannan	S	8.8	18.3	9.1	-9.3	-51%

Roadway Travel Time Reliability

In addition to speeds and LOS, the BTI reliability metric was derived for all CMP segments for which INRIX data were available, where a lower value of BTI indicates higher reliability. With decreased traffic congestion during the COVID pandemic in 2021, reliability improved between 2019 and 2021. However, in 2023 reliability worsened as traffic congestion increased between 2021 and 2023 as people began to return to pre-COVID pandemic activity levels. Between 2021 and 2023, the freeway BTI in the AM peak worsened from 40% to 42% and the freeway BTI in the PM peak worsened from 35% to 42% - its highest level since 2017. In contrast, there is a longer term trend of general improvement in arterial reliability as reflected in decreases in arterial BTI between 2017 and 2023 (Table 4-1 and Figure 4-4).

Figure 4-4. CMP Network Average Travel Time Reliability (BTI) Trend



Note: data collected April – May each year

Roadway Level of Service (LOS)

Figure 4-5 and Figure 4-6 show the LOS by roadway segment for the AM peak and PM peak, respectively. Full LOS monitoring results can be found in Appendix 5. Figure 4-7 and Figure 4-8 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 4-5. 2023 Roadway LOS on CMP Network Segments, Weekday AM Peak

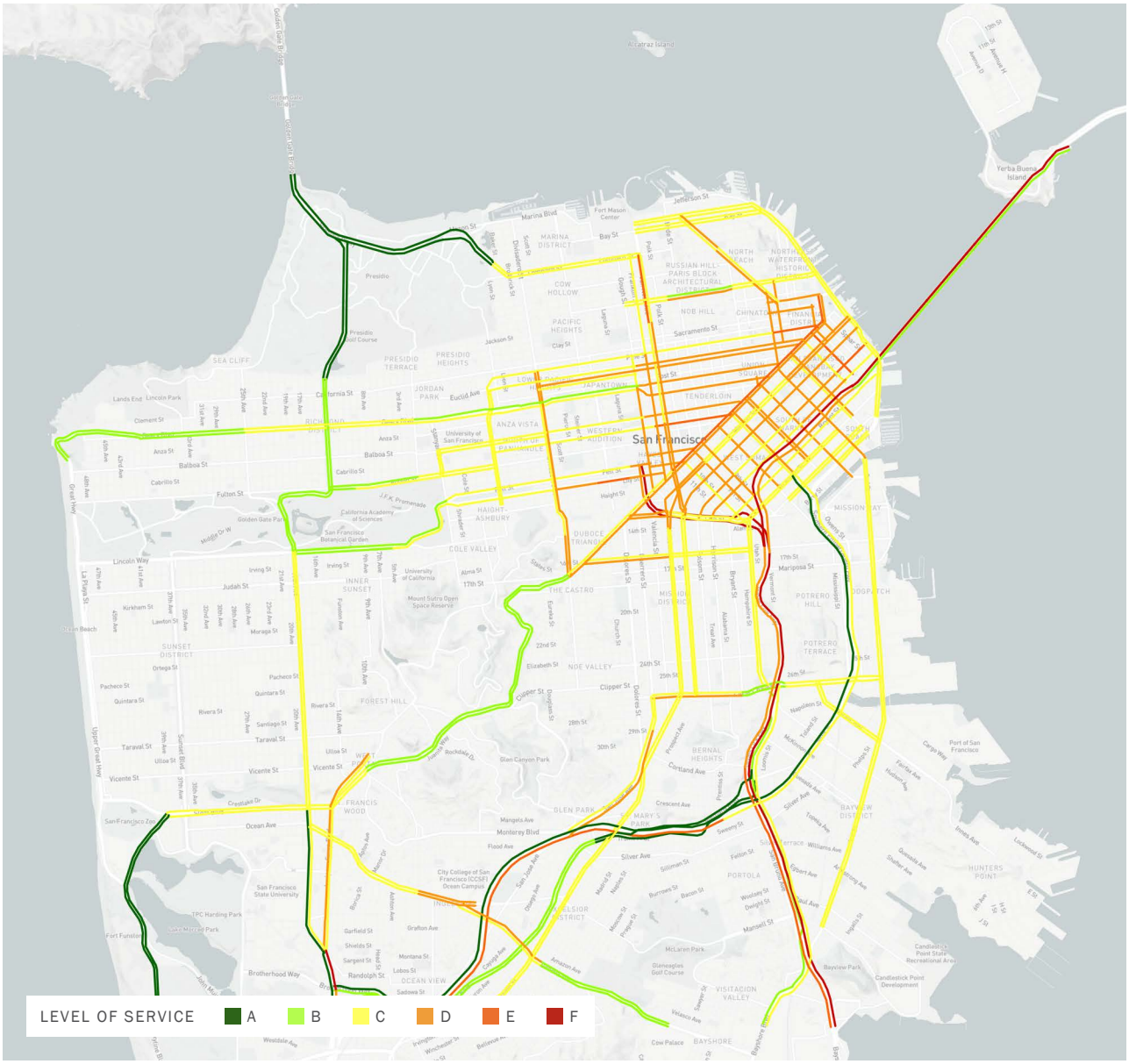


Figure 4-6. 2023 Roadway LOS on CMP Network Segments, Weekday PM Peak

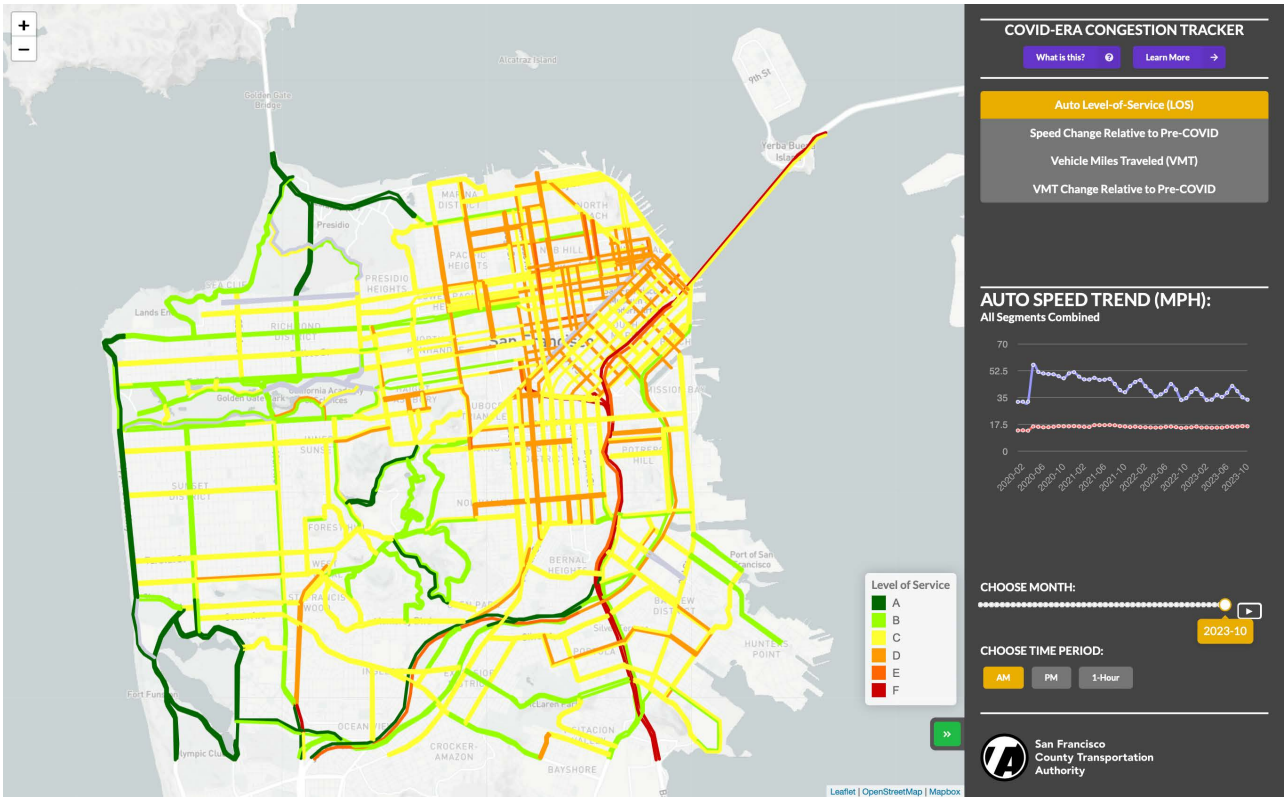
Figure 4-7. 2023 Roadway Buffer Time Index on CMP Network Segments, Weekday AM Peak

Figure 4-8. 2023 Roadway Buffer Time Index on CMP Network Segments, Weekday PM Peak

COVID-Era Congestion Tracker

Due to rapid and uncertain changes in traffic conditions during and after the COVID pandemic, the Transportation Authority maintains a tool for short-term monitoring called the "COVID-Era Congestion Tracker" (covid-congestion.sfcta.org), shown in Figure 4-9. This tool reports many of the same roadway performance metrics as reported the CMP congestion visualization, but with a much greater frequency (monthly instead of biennially) and over a shorter time frame (from March 2020 through the present instead of from Spring 1991 through Spring 2021), for a larger set of roadway segments, and at an hourly level as well as for the AM and PM peak periods.

Figure 4-9. COVID-Era Congestion Tracker



Deficiency Planning

All but one CMP segment with LOS F in the 2023 cycle are exempt. The segment I-80 from Fremont Exit to US-101 is only partially in an IOZ; it was measured at LOS F for the AM period (for the first consecutive CMP monitoring cycle) and requires follow-up monitoring per CMP procedures. However, the Transportation Authority intends to recommend the update of the IOZ within San Francisco per SB 743 before the next CMP cycle. This particular segment would be within the updated IOZ. San Francisco was not found to be deficient for any of the Legislatively Required transit performance measures. A section describing the exempt statuses of segments measured at LOS F in

the current CMP cycle 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

San Francisco County has the most extensive transit coverage in the Bay Area. Transit frequency refers to the number of transit vehicles (buses, trains, or ferries) per unit of time (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). Refer to the websites of transit operators serving San Francisco[1] for information on their service area coverage and transit frequency standards, which may be rapidly changing in the current post-COVID pandemic context. The current frequency and coverage service levels of Muni and other transit operators serving San Francisco can be found in Appendix 7.

Figure 4-10. Muni Service Map (Effective Aug 2023)

1 The main transit operators in San Francisco include Muni, BART, Caltrain, AC Transit (Transbay service), SamTrans, and Golden Gate Transit (bus and ferry)

Muni transit coverage by walk access at different levels of headways has been reported since the 2021 CMP cycle. This transit coverage metric reports the percent of San Francisco's total population and total jobs that are within a 5-minute walk of Muni transit service, using Muni's General Transit Feed Specification (GTFS), and population and employment data derived from the US Census' American Community Survey and San Francisco Planning Department. The metric has been calculated annually for each April-May period from 2017 to 2021 and for the same period in 2023.

Since the significant cuts in Muni service in 2020 in the midst of the COVID pandemic, Muni service has been restored in 2023 so that now more than 95% of San Francisco residents live within a 5-minute walk of Muni service. However, the share of the population within a 5-min walk of transit route with a 5-min headway continued to decline from 33% in 2021 to 27% in 2023 for the AM peak and from 26% in 2021 to 20% in 2023 for the PM peak (Figure 4-11 and Figure 4-12).

Figure 4-11. Percentage of SF Population within 5-min walk by Service Frequency, Weekday AM Peak

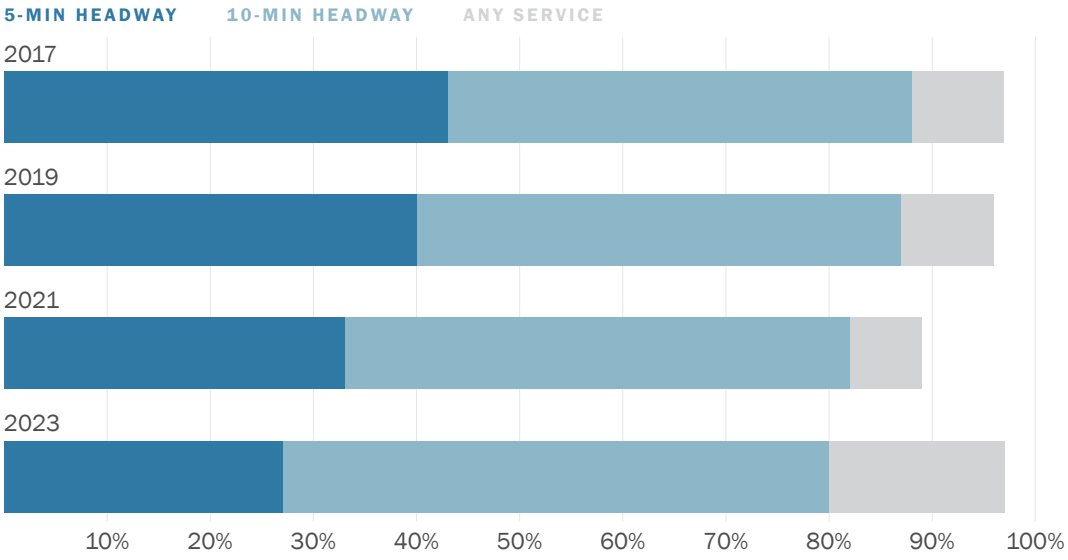
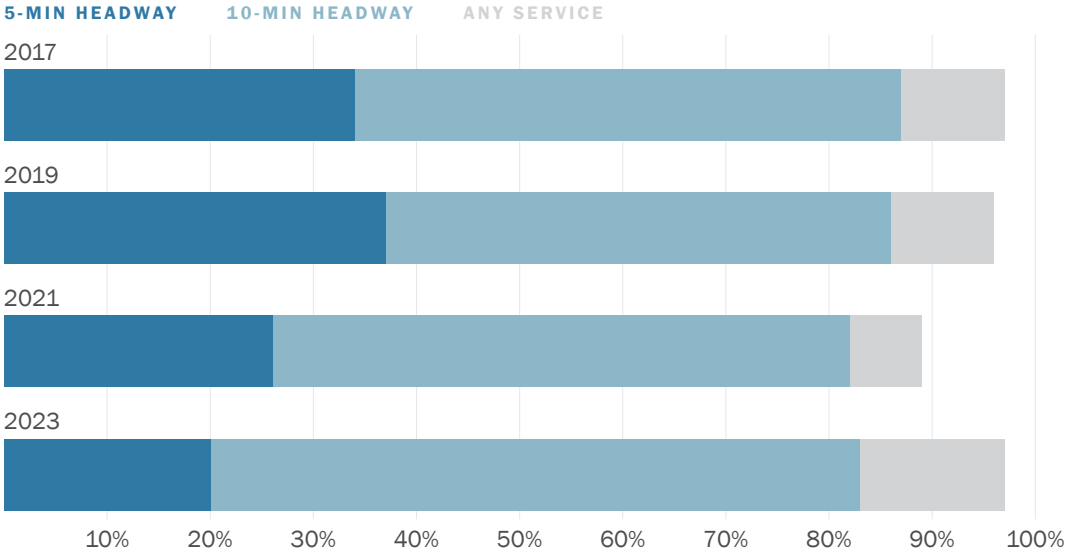


Figure 4-12. Percentage of SF Population within 5-min walk by Service Frequency, Weekday PM Peak



Transit coverage in terms of jobs for both the AM and PM periods show trends similar to those observed in population transit coverage (Figures 4-10 and 4-11).

Figure 4-13. Percentage of SF Jobs within 5-min walk by Service Frequency, Weekday AM Peak

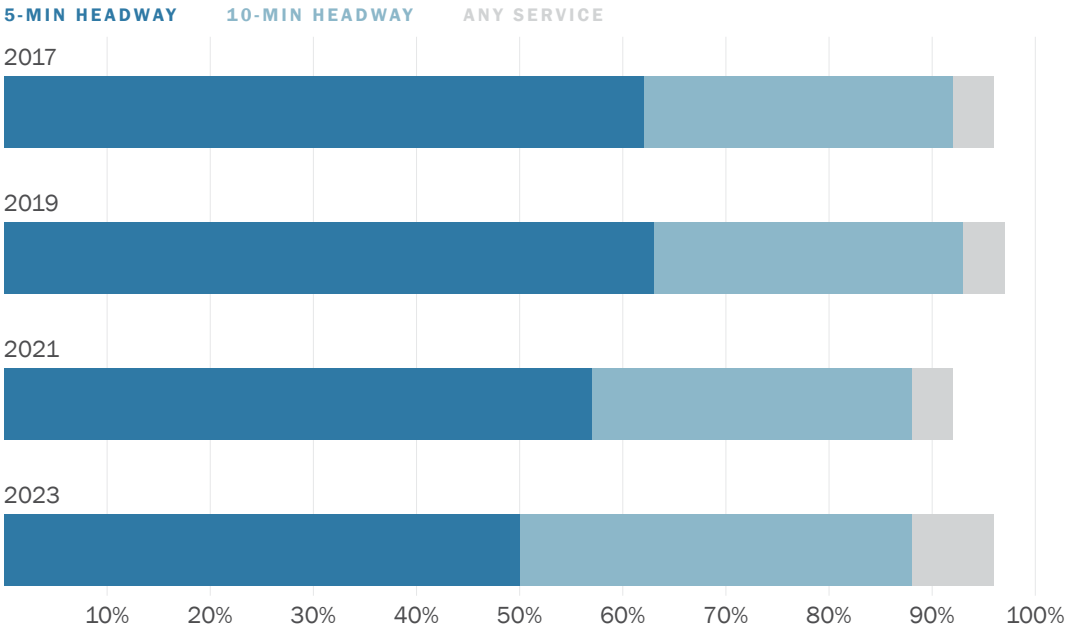


Figure 4-14. Percentage of SF Jobs within 5-min walk by Service Frequency, Weekday PM Peak

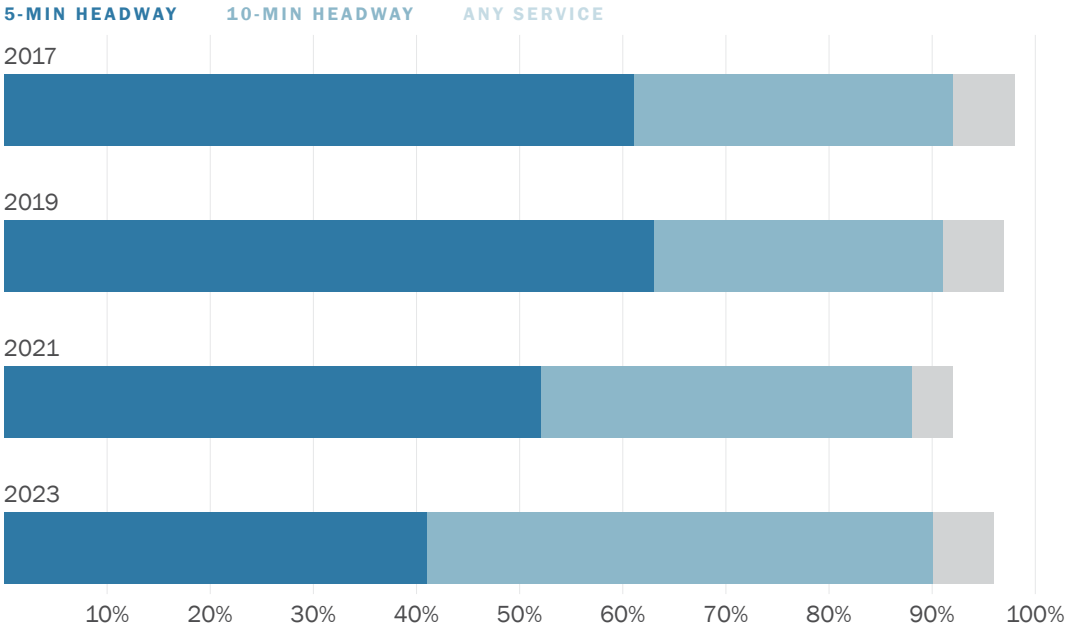
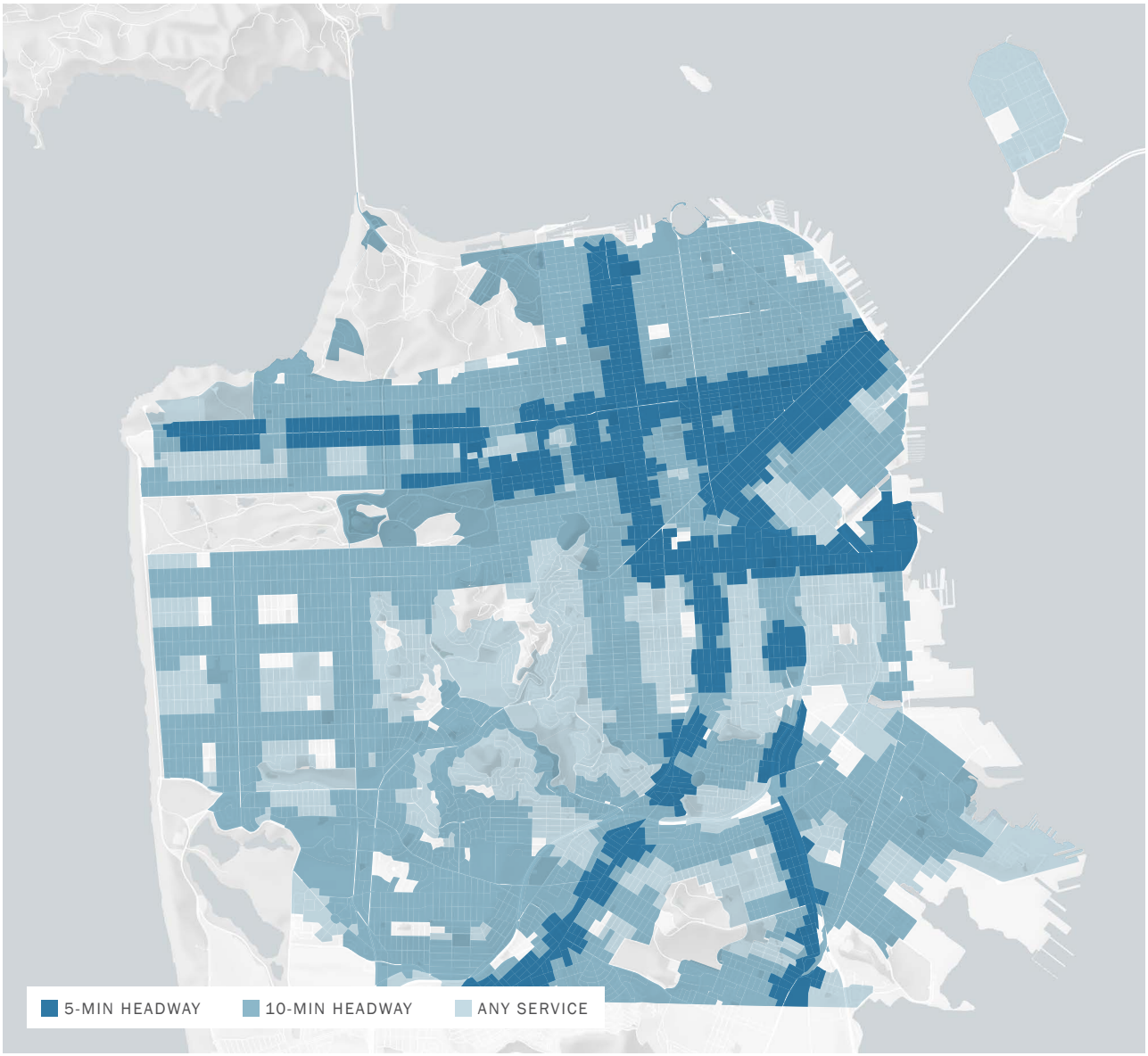


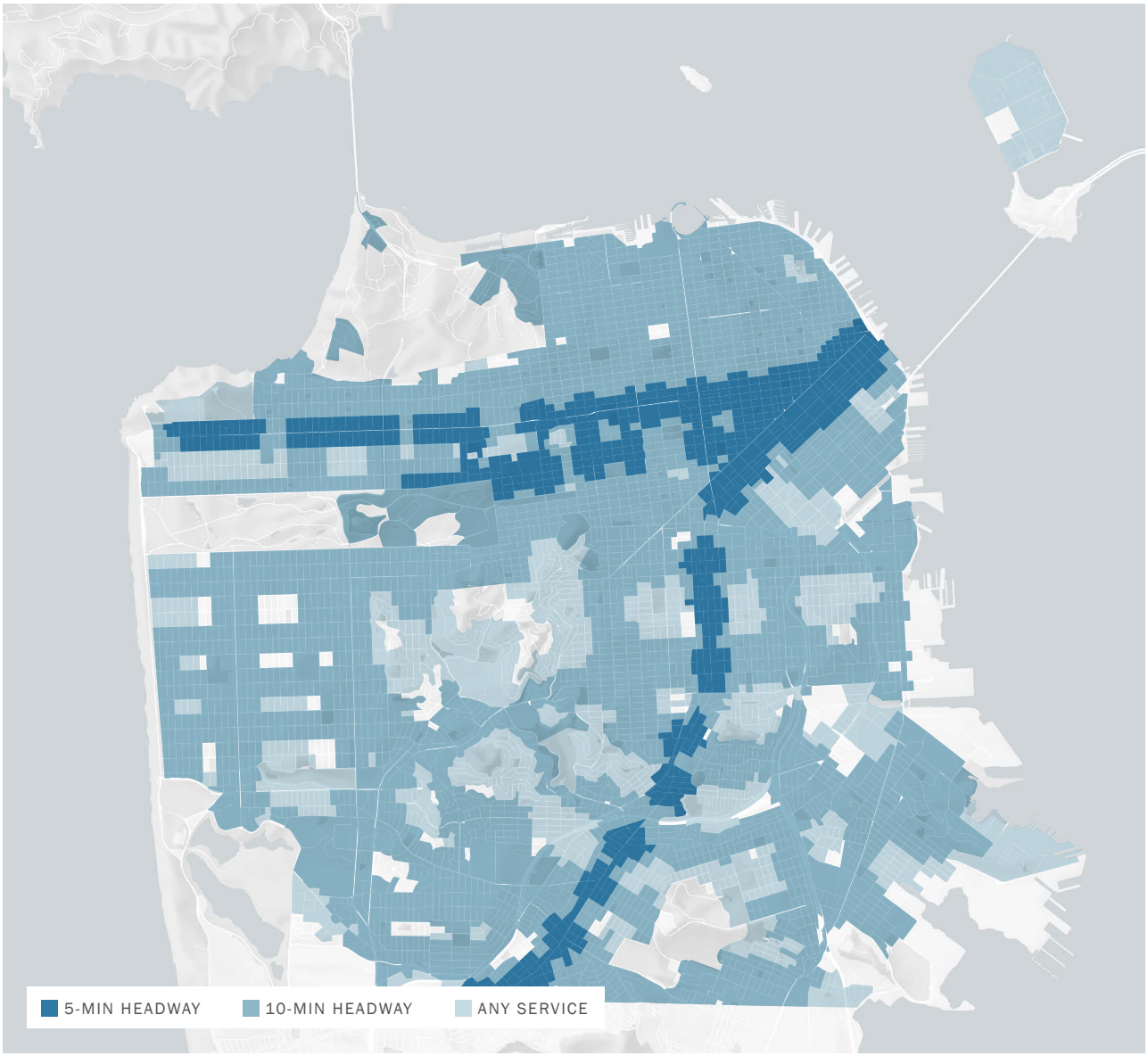
Figure 4-15 and Figure 4-16 show maps of transit coverage in Spring 2023 by service frequency for AM and PM peak periods respectively. Each service frequency layer also includes the areas covered by service frequencies lower than it. For example, the area coverage shown for "Any service" also includes the areas covered under 10-minute and 5-minute frequencies.

Figure 4-15. Transit Coverage by Service, Weekday AM Peak



Note: data are from April – May of the monitoring year

Figure 4-16. Transit Coverage by Service, Weekday PM Peak



Note: data are from April – May of the monitoring year

4.4.3 INTEROPERATOR COORDINATION

Linkages between transit services are 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. To that end, MTC has set up the Fare Integration Task Force in 2020 to further fare coordination and intergration in the

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. Other than the outdated LOS standard 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
- Transit / Auto Speed Ratio
- Multimodal Counts
- 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 collect robust, real-time data on bus performance and ridership. For the current CMP cycle, APC data collected on Muni's bus (diesel and trolley coach) fleet in the entire months of April and May 2023 were analyzed. Muni light rail vehicles are not currently equipped with APCs, and were thus not included in the analysis. The raw APC transit data utilized corresponded to the same AM (7-9 a.m.) and PM (4:30-6:30 p.m.) peak periods as the Automobile

LOS monitoring. A detailed description of the APC data collection and analysis methodology can be found in Appendix 8.

Similar to automobile roadway speeds, average transit travel speeds on the CMP network have decreased since 2021 as people began to return to pre-COVID pandemic activity levels, but are still higher than the pre-COVID pandemic average speeds in 2019 for both the AM and PM peak periods. However, the increase in transit speeds between 2019 and 2023 is less than the increase in roadway speeds. In 2023, AM peak transit speeds were 7% lower than in 2021, but still remained 7% higher than they were in 2019 (pre-COVID pandemic); PM peak transit speeds were 13% lower than in 2021, but still remained 7% higher than they were in 2019 (pre-COVID pandemic). Table 4-5 shows the change in average transit speeds. Figures 4-14 illustrates average bus speeds on CMP segments in the AM and PM peak periods since 2011. Appendix 8 contains the full results from all transit segments.

Table 4-5. CMP Network Average Transit Speed Change

CATEGORY	TIME PERIOD	TIME-MEAN TRAVEL SPEED				
		2019	2021	2023	% CHANGE FROM 2019	% CHANGE FROM 2023
Arterial	AM	8.4	9.7	9.0	+7%	-7%
	PM	7.6	9.4	8.1	+7%	-13%

Figure 4-17. CMP Network Average Transit Speeds Trend

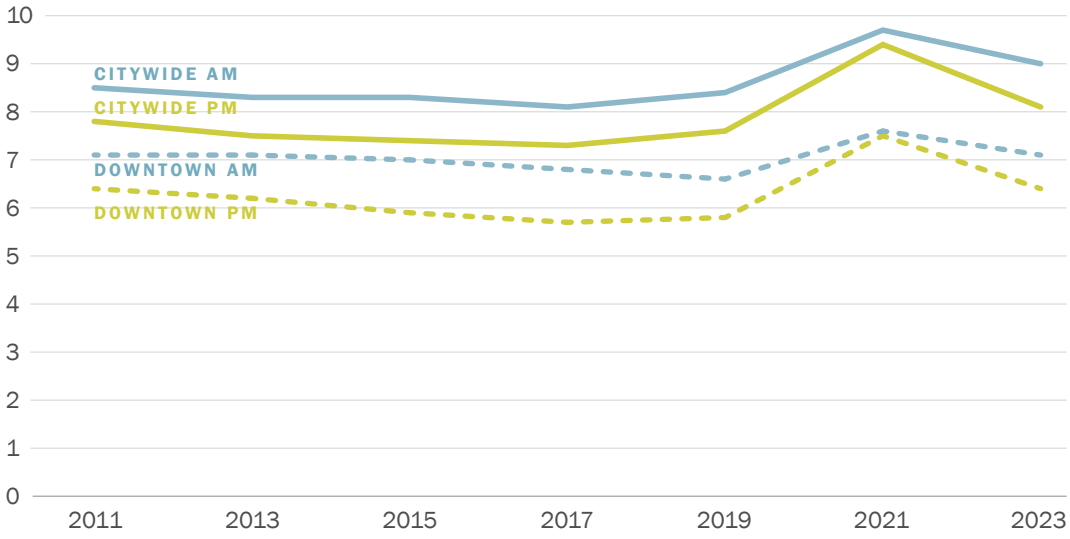


Table 4-6 and Table 4-7 shows CMP segments with the slowest transit speeds in the current CMP cycle. In 2021, no CMP segment had bus speeds less than 5 miles per hour, while in 2023 a number of segments fell below this threshold. The slowest transit speed during the AM peak period was 3.9 mph on Turk from Market to Hyde. During the PM period, the slowest transit speed was 3.8 mph, also on Turk from Market to Hyde. 3%

of the monitored CMP segments have a speed under 5 mph in the AM peak period, whereas 4% of the monitored CMP segments have a speed under 5 mph in the PM peak period.

Table 4-6. Slowest Bus Speed CMP Segment, AM Peak Period (7AM – 9AM)

CMP SEGMENT	FROM	TO	DIR.	SPEED (MPH)
Turk	Market	Hyde	W	3.9
Kearny	Market	Columbus	N	4.7
Castro/Divisadero	Geary	Pine	N	4.8
Columbus	North Point	Greenwich	S	5.1
Clay	Kearny	Davis	E	5.4
Mission/Otis	Embarcadero	3rd	S	5.5
Castro/Divisadero	Pine	Geary	S	5.7
Mission/Otis	14th	9th	N	6.1
Castro/Divisadero	14th	Geary	N	6.3
Sutter	Mason	Gough	W	6.4

Table 4-7. Slowest Bus Speed CMP Segment, PM Peak Period (4:30 PM – 6:30 PM)

CMP SEGMENT	FROM	TO	DIR.	SPEED (MPH)
Turk	Market	Hyde	W	3.8
Folsom	4th	1st	E	4.5
Mission/Otis	Embarcadero	3rd	S	4.5
Columbus	North Point	Greenwich	S	4.5
Geneva	Cayuga	Paris	E	5.1
Castro/Divisadero	Pine	Geary	S	5.1
Hayes	Market	Gough	W	5.2
Mission/Otis	3rd	Embarcadero	N	5.2
Castro/Divisadero	Geary	Pine	N	5.3
Broadway	Powell	Montgomery	E	5.3

Table 4-8 and Table 4-9 shows the CMP segments with the greatest relative changes in average bus speeds since 2021 (in the midst of the COVID pandemic). Between 2021 and 2023, the largest percentage decrease in transit speeds was at -35% for the AM peak, whereas for the PM peak it was at -27%. Figure 4-18 and Figure 4-19 show maps of 2021 monitored transit speeds by segment for the AM and PM peaks.

Table 4-8. CMP Segments with Highest Percent Decreases in Bus Speed: 2021 to 2023, AM Peak Period (7AM – 9AM)

CMP SEGMENT	FROM	TO	DIR.	2021 BUS SPEED (MPH)	2023 BUS SPEED (MPH)	CHANGE (MPH)	CHANGE (%)
Cesar Chavez	Guerrero	Bryant	E	12.0	7.8	-4.2	-35%
Market/Portola	Castro	Burnett	W	18.8	13.1	-5.7	-30%
Masonic	Page	Geary	N	11.7	8.8	-2.9	-25%
Potrero	21st	Division	N	11.9	9.3	-2.6	-22%
16th St	Market	Mission	E	8.5	6.8	-1.7	-20%

Table 4-9. CMP Segments with Highest Percent Decreases in Bus Speed: 2021 to 2023, PM Peak Period (4:30 PM – 6:30 PM)

CMP SEGMENT	FROM	TO	DIR.	2021 BUS SPEED (MPH)	2023 BUS SPEED (MPH)	CHANGE (MPH)	CHANGE (%)
Market/Portola	Santa Clara	Burnett	E	16.6	12.1	-4.5	-27%
Fulton	Arguello	Masonic	E	11.0	8.1	-2.9	-26%
Potrero	21st	Division	N	11.3	8.6	-2.7	-24%
Fulton	Park Presidio	10th Ave	E	15.5	12.0	-3.5	-23%
Kearny	Market	Columbus	N	6.8	5.3	-1.5	-22%

Figure 4-18. 2023 Average Muni Bus Speeds on CMP Network Segments, Weekday AM Peak

Figure 4-19. 2023 Average Muni Bus Speeds on CMP Network Segments, Weekday PM Peak

4.5.2 TRANSIT SPEED RELIABILITY

Beyond the average transit speed, San Francisco Municipal Transportation Agency's (SFMTA) automatic passenger counter (APC) data were also used to calculate transit speed reliability (variability). 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 time 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 improved (i.e. variability decreased) since 2021, returning back to the same levels (21%) observed in 2019 for both the AM and PM peak (Table 4-10 and Figure 4-20). Segments with less reliable transit speeds (CV > 30%) are shown in Tables 4-8 and 4-9. Figure 4-21 and Figure 4-22 show maps of transit reliability by segment for the AM and PM peaks. Appendix 8 contains the full results from all transit segments.

Table 4-10. CMP Network Average Transit Speed Variability (Coefficient of Variation)

	2013	2015	2017	2019	2021	2023
AM	16%	16%	16%	21%	23%	21%
PM	16%	18%	18%	21%	25%	21%

Figure 4-20. CMP Network Transit Speed Variability Trend

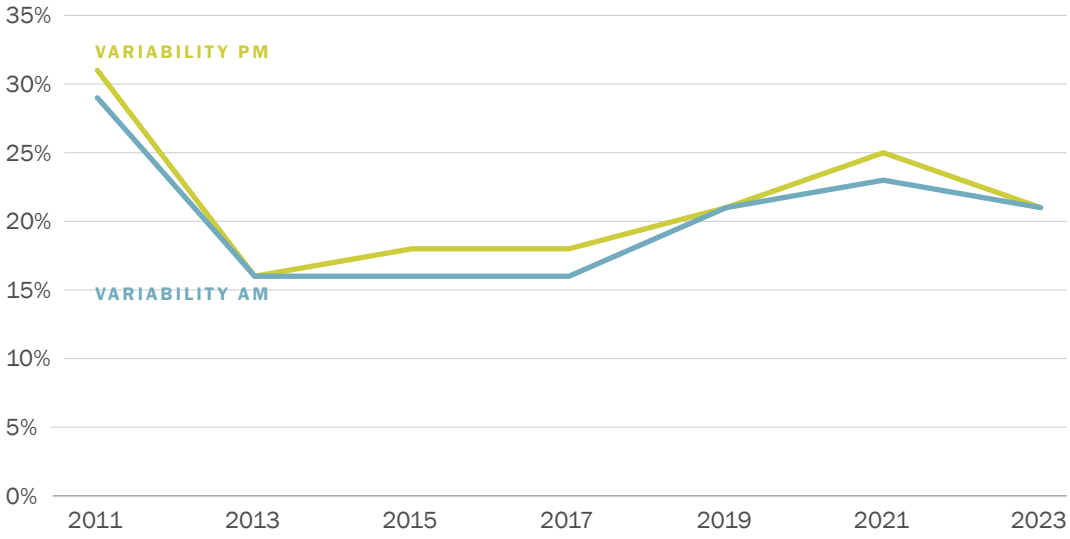


Table 4-11. Least Reliable Transit Segments in 2023 (CV>30%), AM Peak

NAME	FROM	TO	DIR	AVG. TRANSIT SPEED (MPH)	S.D TRANSIT SPEED (MPH)	CV (%)
Folsom	4th	1st	E	6.5	2.5	38.0%
Broadway	Powell	Montgomery	E	6.9	2.4	34.6%
Fulton	10th Ave	Arguello	E	10	3.3	32.8%
North Point	Van Ness	Columbus	E	7.5	2.4	32.0%
Fulton	10th Ave	Park Presidio	W	9.8	3.1	31.2%
Harrison	4th	8th	W	9.7	3	30.7%
Masonic	Page	Geary	N	8.8	2.7	30.7%
16th St	Market	Mission	E	6.8	2.1	30.6%

Table 4-12. Least Reliable Transit Segments in 2023 (CV>30%), PM Peak

NAME	FROM	TO	DIR	AVG. TRANSIT SPEED (MPH)	S.D TRANSIT SPEED (MPH)	CV (%)
Mission/Otis	9th	14th	S	7.5	2.6	34.5%
Clay	Kearny	Davis	E	6.8	2.3	34.3%
Masonic	Geary	Page	S	6.5	2.2	33.8%
Mission/Otis	3rd	Embarcadero	N	5.2	1.7	32.5%
Fulton	10th Ave	Arguello	E	9.9	3.1	31.0%
North Point	Columbus	Van Ness	W	6.8	2.1	31.0%
O'Farrell	Gough	Mason	E	8.7	2.7	31.0%
Harrison	4th	8th	W	8.9	2.8	30.9%
Fulton	10th Ave	Park Presidio	W	7.2	2.2	30.6%
Geneva	Cayuga	Paris	E	5.1	1.5	30.6%

Figure 4-21. 2023 Average Muni Bus Speed Reliability on CMP Network Segments, Weekday AM Peak

Figure 4-22. 2023 Average Muni Bus Speed Reliability 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 2023, 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. The ratio had been improving between 2011 and 2019, worsened during the COVID pandemic in 2021, and improved again between 2021 and 2023 (though still not back to 2019 levels) (Table 4-13 and Figure 4-23). Even though both average auto and transit speeds have decreased since 2021, transit speeds have declined relatively more than auto speeds during this time period, resulting in transit being less competitive relative to auto in 2023 than 2019.

CMP Segments with auto to transit speed ratios of 2.0 or higher are shown in Tables 4-10a and 4-10b. No monitored segment in the current cycle has an auto to transit speed ratio under or equal to 1 (which would mean that transit is at least as fast as autos).

Appendix 8 contains the full auto-to-transit speed results from all transit segments. Figure 4-24 and Figure 4-25 show maps of auto-to-transit ratios by segment for the AM peak and PM peak, respectively.

Table 4-13. CMP Network Auto/Transit Speed Ratio Change

TIME PERIOD	2013	2015	2017	2019	2021	2023
AM	2.07	1.77	1.67	1.59	1.82	1.73
PM	2.12	1.72	1.66	1.61	1.77	1.72

Figure 4-23. CMP Network Auto-Transit Speed Ratio Trend

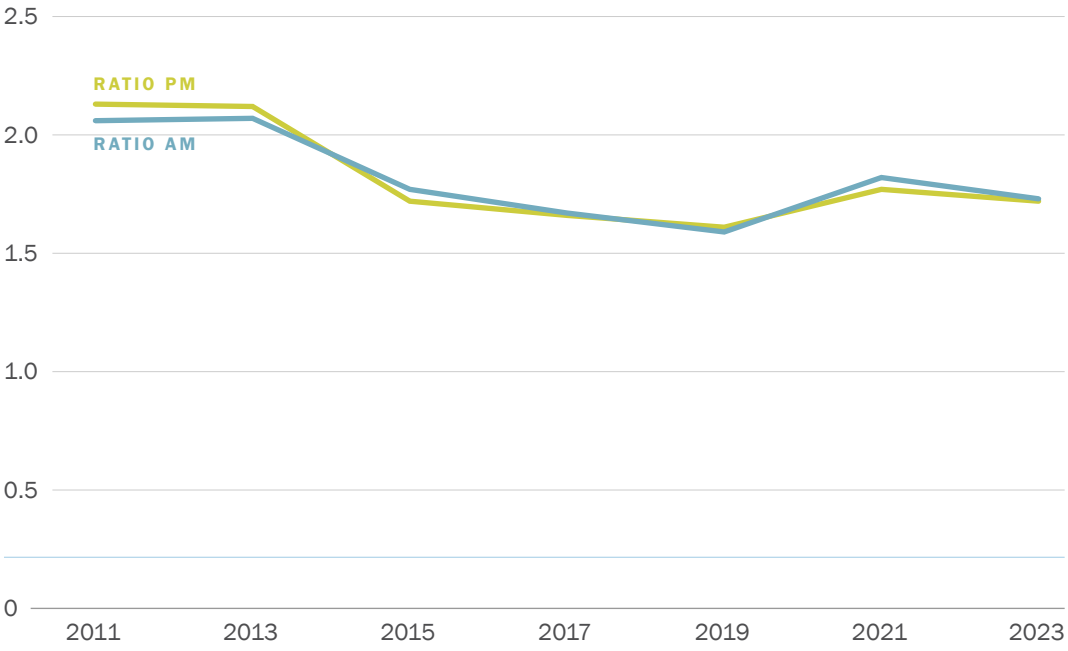


Table 4-14. Segments with Auto to Transit Speed Ratio of 2.0 or higher, AM Peak

NAME	FROM	TO	DIR	AVG. TRANSIT SPEED (MPH)	AVG. AUTO SPEED (MPH)	AUTO:TRANSIT SPEED RATIO
Columbus	North Point	Greenwich	S	5.1	14.5	2.8
Turk	Market	Hyde	W	3.9	9.2	2.3
Potrero	21st	Cesar Chavez	S	8	18.1	2.3
North Point	Van Ness	Columbus	E	7.5	16.3	2.2
Fulton	Masonic	Arguello	W	8.5	18.3	2.1
16th St	Mission	Market	W	6.7	14.3	2.1
Geneva	Cayuga	Paris	E	6.6	13.9	2.1
Fulton	Arguello	10th Ave	W	11.1	23	2.1
Kearny	Market	Columbus	N	4.7	9.8	2.1
Potrero	Cesar Chavez	21st	N	6.8	13.8	2
Castro/Divisadero	Geary	Pine	N	4.8	9.7	2

Table 4-15. Segments with Auto to Transit Speed Ratio of 2.0 or higher, PM Peak

NAME	FROM	TO	DIR	AVG. TRANSIT SPEED (MPH)	AVG. AUTO SPEED (MPH)	AUTO:TRANSIT SPEED RATIO
Columbus	North Point	Greenwich	S	4.5	12.5	2.8
Turk	Market	Hyde	W	3.8	9.7	2.6
Broadway	Powell	Montgomery	E	5.3	11.9	2.3
Columbus	Greenwich	North Point	N	6.1	13.5	2.2
Geneva	Cayuga	Paris	E	5.1	11.2	2.2
Fulton	Masonic	Arguello	W	7.8	17.1	2.2
Sutter	Mason	Gough	W	5.5	12	2.2
North Point	Van Ness	Columbus	E	6.1	13.3	2.2
Bayshore	Jerrold	Industrial	S	9.4	20	2.1
Fulton	Arguello	10th Ave	W	9.5	20.1	2.1
Mission/Otis	14th	9th	N	6.1	12.8	2.1
Mission/Otis	Embarcadero	3rd	S	4.5	9.2	2
Geary	25th Ave	Arguello	E	8.3	16.6	2

Figure 4-24. 2023 Auto-to-Transit Speed Ratios on CMP Network Segments, Weekday AM Peak

Figure 4-25. 2023 Auto-to-Transit Speed Ratios on CMP Network Segments, Weekday PM Peak

4.5.4 MULTIMODAL COUNTS

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 demand-side factors affecting San Francisco's transportation system, and create a set of data that can be analyzed longitudinally by various modes, the Transportation Authority supported a multimodal volume monitoring program beginning with the 2015 CMP.

The City and County of San Francisco has placed a high priority on shifting travel behavior towards active transportation modes such as 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.

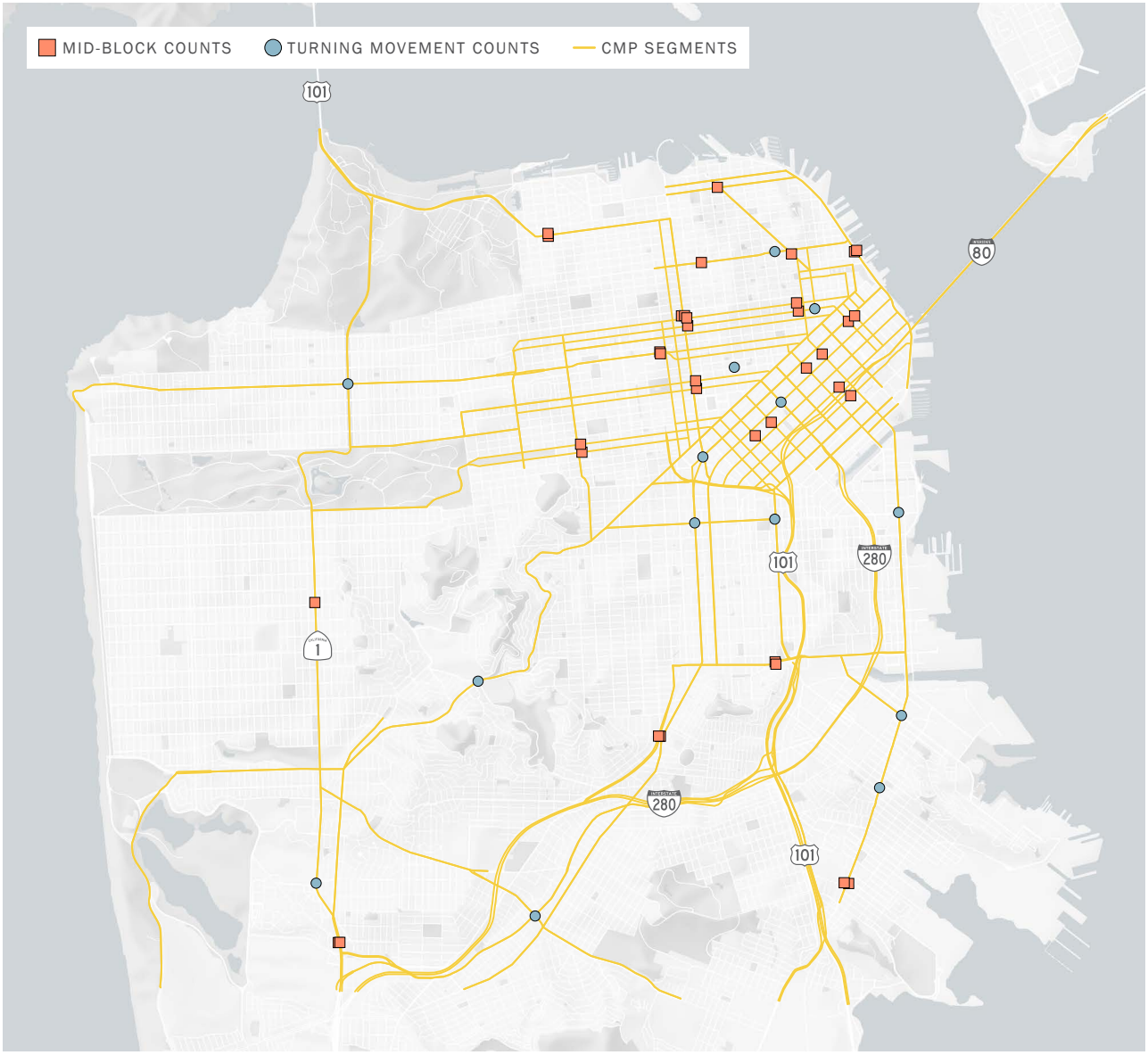
Counts are collected at 29 mid-block locations (vehicle only)[1] and 14 intersections (vehicle, bicycle, and pedestrian) (Figure 4-26). Vehicle-only mid-block mainline counts were collected over 3 continuous mid-week days (Tuesday to Thursday). The Transportation Authority collected weekend counts too (i.e. data collection from Tuesday to Sunday) at three of these mid-block locations during the CMP 2023 monitoring period. Intersection counts were conducted on a single day during the AM (7:00 a.m.–9:00 a.m.) and PM (4:30 p.m.–6:30 p.m.) peak periods for vehicles, bicycles, and pedestrians. The biennial collection of multimodal counts at a fixed set of locations is expected to provide information about long term performance trends just like LOS monitoring.

The following three sections detail the results of the multimodal volume monitoring by mode (vehicle, bicycle, and pedestrian).[2] Refer to Appendix 9 for further details.

1 Of the 29 mid-block locations, 16 are one-ways and 13 are two-ways.

2 The CMP 2023 corrects and publishes previously unreported mid-block average weekday traffic counts from the CMP 2017 to 2021. These previously unreported counts are included in the sums presented in the figures in the multimodal counts section.

Figure 4-26. Locations of Turning Movement and Mid-Block Counts

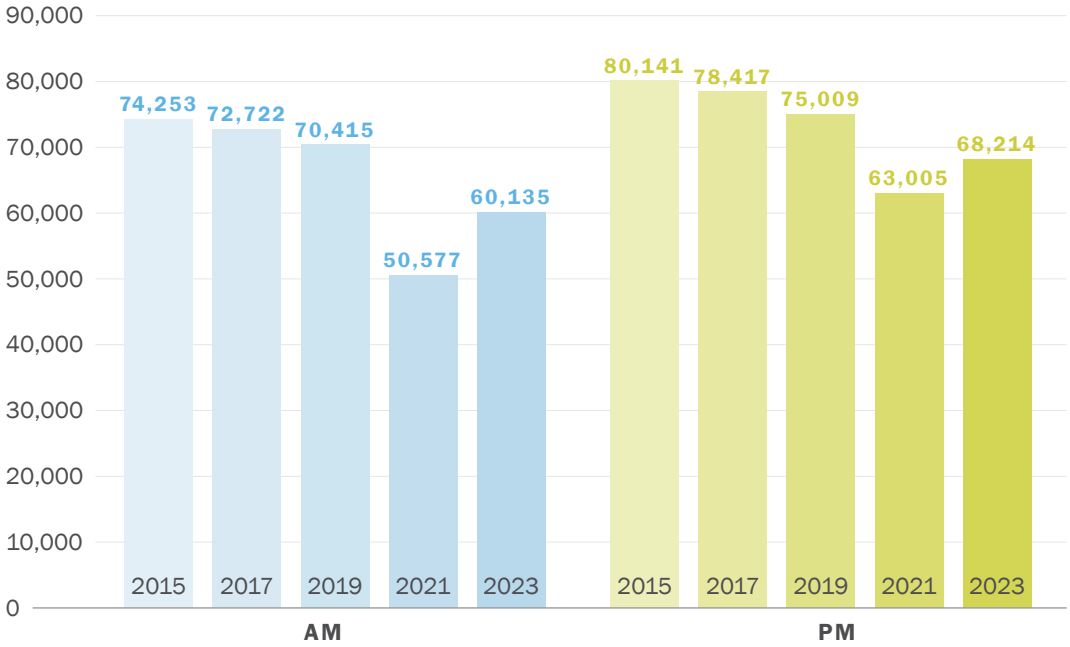


Vehicle Counts

Vehicle counts are collected at both intersections and mid-block locations. Total vehicle counts traversing through all intersection count locations during the AM and PM peak on the day of collection are shown in Figure 4-27. The mid-block counts were processed to obtain the typical weekday average peak traffic and average daily traffic (ADT) for each location and direction. These are then summed up for each CMP year Figure 4-28 and Figure 4-29).

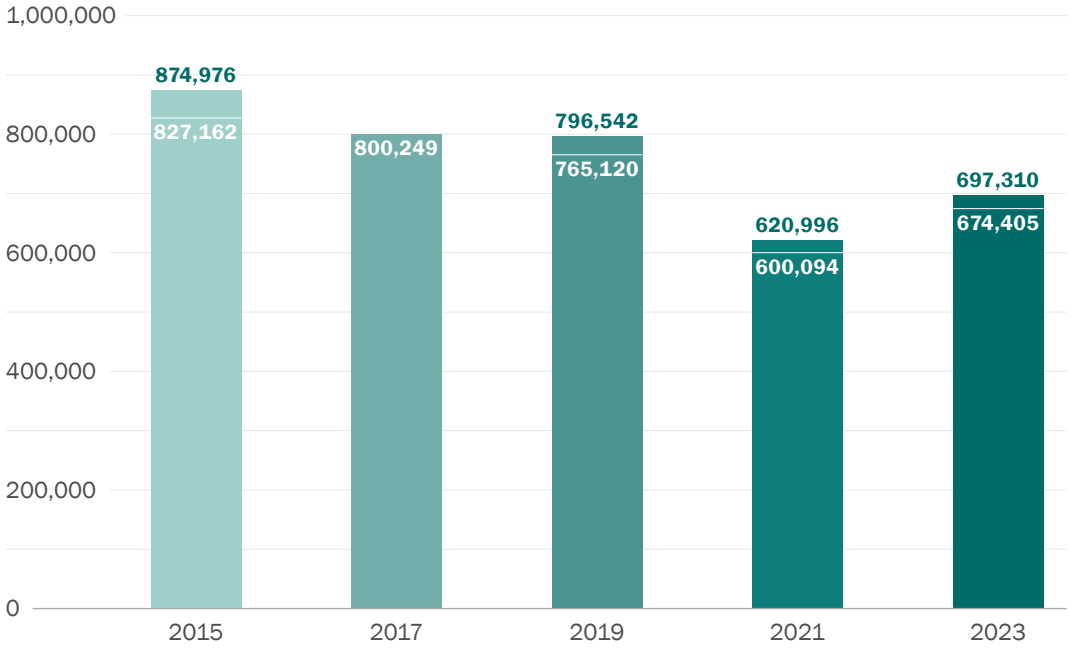
See Appendix 9 for further details.

Figure 4-27. Intersection single-day vehicle counts 2015-2023



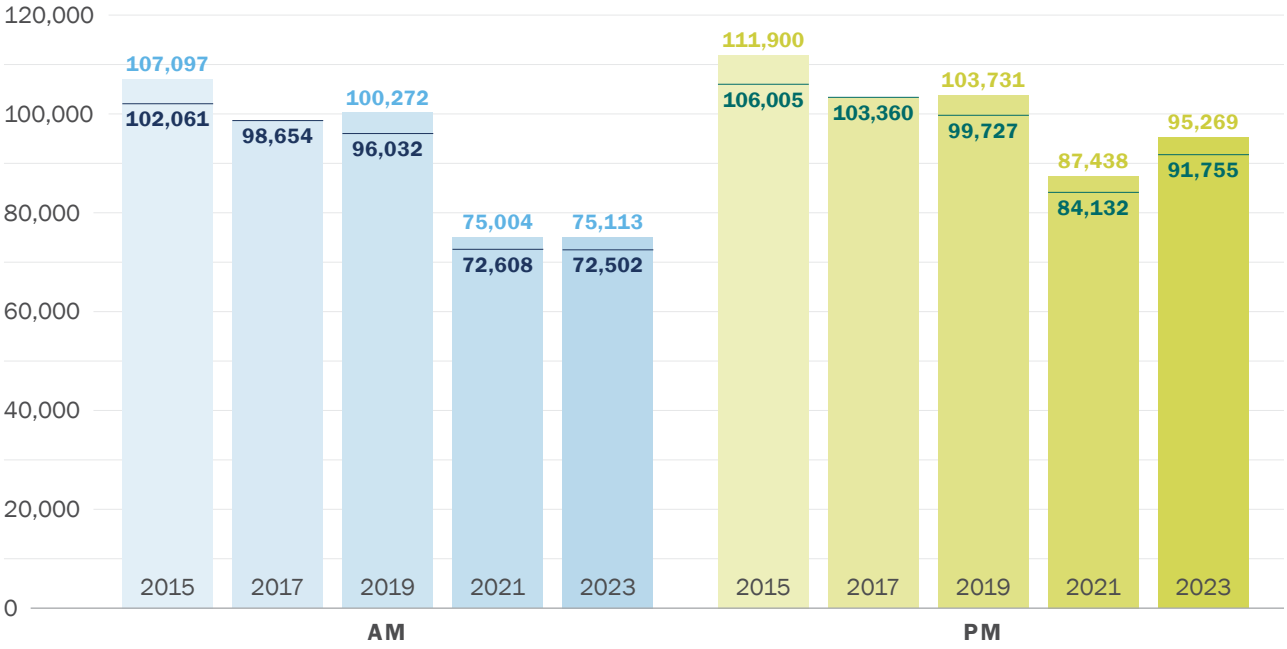
* Data collected April–May biennially at the same locations, counts shown are summed over all locations.

Figure 4-28. Mid-block weekday average daily traffic (ADT) 2015 – 2023



* Data collected April–May biennially at the same locations, counts shown for the bars are summed over all 29 locations and directions, whereas the white line within each bar only only shows counts summed over 28 locations and directions (excluding counts from Van Ness between California and Pine, where no data were collected in 2017).

Figure 4-29. Mid-block weekday average AM/PM peak traffic counts 2015-2023

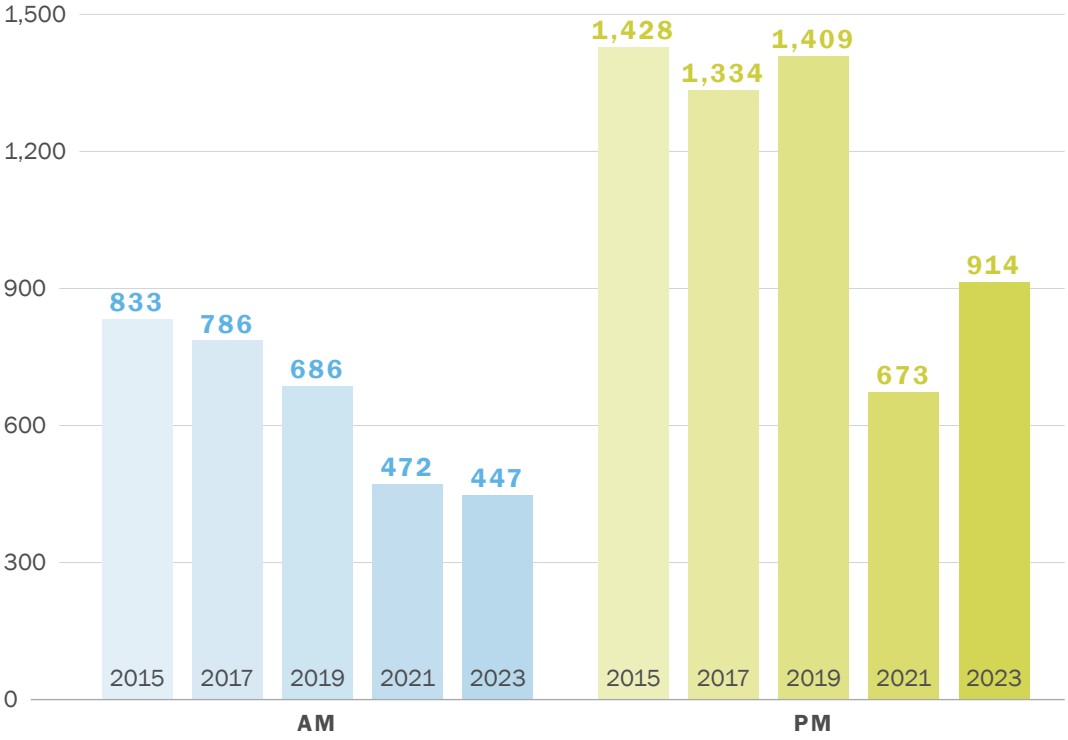


* Data collected April–May biennially at the same locations, counts shown for the columns are summed over all 29 locations and directions, whereas the line within each column only only shows counts summed over 28 locations and directions (excluding counts from Van Ness between California and Pine, where no data were collected in 2017).

Bicycle Counts

SFMTA has conducted citywide bicycle counts at key intersections and corridors since 2006, and the SFMTA reports can be found at sfmta.com/bicycle-ridership-data. In addition to SFMTA, SFCTA has continued to collect manual bike counts as part of its multimodal counts effort at intersection locations since 2015 (Figure 4-30). 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 April-May 2023.

Figure 4-30. Intersection single-day bicycle counts 2015-2023

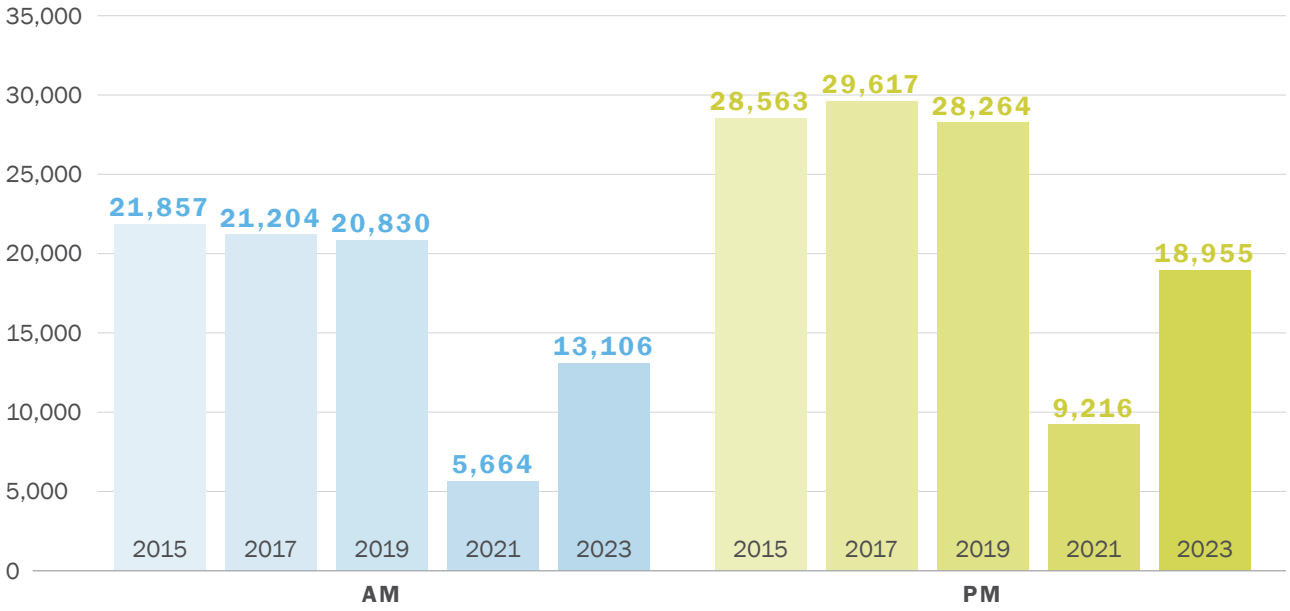


* Data collected April–May biennially at the same locations, counts shown are summed over all locations.

Pedestrian Counts

In addition to vehicle and bicycle counts, pedestrian counts are also collected longitudinally since 2015 at intersections (Figure 4-31).

Figure 4-31. Intersection Pedestrian Counts 2015 – 2023



* Data collected April–May biennially at the same locations, counts shown are summed over all locations.

Analysis of Multimodal Counts

There is an increase in daily traffic from 2021 (Figure 4-28), but none of the vehicle counts (daily or AM/PM peak) show a recovery back to pre-COVID pandemic levels. The various 2023 vehicle counts stand at 75-92% of 2019 (pre-COVID pandemic) levels. The trendlines may suggest that the ongoing vehicular traffic decrease observed from 2015 to 2019 is continuing in 2023.

As discussed in the CMP 2021, pedestrian counts dropped more precipitously than vehicle or bike counts between 2019 and 2021, with bicycle counts having dropped 31% and 52% for the AM and PM peak respectively (Figure 4-30), as opposed to 73% and 67% respectively for pedestrian counts (Figure 4-31). Pedestrian counts during both the AM and PM peak periods, and bicycle counts during the PM peak period all show an increase in 2023 from 2021. On the contrary, bicycle counts during the AM peak show a slight 5% decrease between 2021 and 2023. In 2023, pedestrian counts show a recovery to 63% and 67% for the AM and PM peak respectively of 2019 (pre-COVID pandemic) levels, whereas bicycle counts show a recovery to 65% (for both the AM and PM peaks) respectively of 2019 (pre-COVID pandemic) levels.

Notably, the mid-block vehicular counts and the intersection bicycle counts during the AM peak period show a flat line (for vehicles) or even a slight decrease (for bicycles) between 2021 and 2023 counts. Given the general increase in counts across the three modes between 2021 and 2023, we may hypothesize that AM peak travel, which is primarily for work and school purposes, may no longer be as strongly peaked as before

the COVID pandemic, possibly because fewer people are traveling to work with the rise of remote work, or the AM peak has shifted outside our data collection period of 7:00-9:00 a.m. In contrast, people travel for a wider diversity of activities during the PM peak (4:30-6:30 p.m.), resulting in a stronger recovery in multimodal volumes in the PM peak. Care should be taken though in interpreting these aggregate counts, given the small sample sizes (both at each location and the small number of locations), which means that any event (traffic or otherwise), however minor, happening near a monitoring location during the very short monitoring period (2 hours for each peak on a single day for intersection counts, 3 days for mid-block counts) can greatly affect the results.

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 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) and Bay Area Toll Authority (BATA). One screenline is across the Bay Bridge and the other is at the San Mateo countyline on the US-101 and I-280 freeways. BATA only provides Westbound counts on the Bay Bridge, whereas PeMS provides counts in both directions on the Bay Bridge and at the San Mateo countyline.

Figure 4-32 shows westbound Bay Bridge vehicle volumes collected by the Bay Bridge Toll Authority (BATA). In 2023, westbound Bay Bridge volumes returned to 2019 levels for the PM peak, and to about 6% below 2019 levels for the AM peak. Note though that there has already been a slight decrease (more pronounced for the AM peak) in westbound Bay Bridge volumes between 2017 and 2019 before the COVID pandemic. Since 2021, westbound Bay Bridge volumes have been stable at 2021 volumes for both the AM and PM peaks.

To provide continuity and a comparison with previous CMP reports, Figure 4-33 shows Bay Bridge volumes collected in both directions by Caltrans PeMS sensors, which we have used in previous CMP cycles. PeMS sensor health has been an ongoing issue, and by 2023, none of the sensors that we have previously used to report Bay Bridge volumes (on the western span) are reporting data, resulting in the need to use a sensor in each direction on the eastern span. However, due to these sensor health issues and differences in volumes collected by each sensor on the Bay Bridge, the PeMS volume trends must only be interpreted with extreme caution.

Figure 4-34 shows the total average peak period volumes on US-101 and I-280 freeways at the San Mateo countyline. The volumes at this screenline saw a drop of about 50% between 2019 and 2020. Since then, the peak period volumes have returned to their 2019 levels by 2023.

Figure 4-32. Average Bay Bridge Westbound Screenline Volumes, Weekday Peak Period (BATA) (Apr-May of each year)

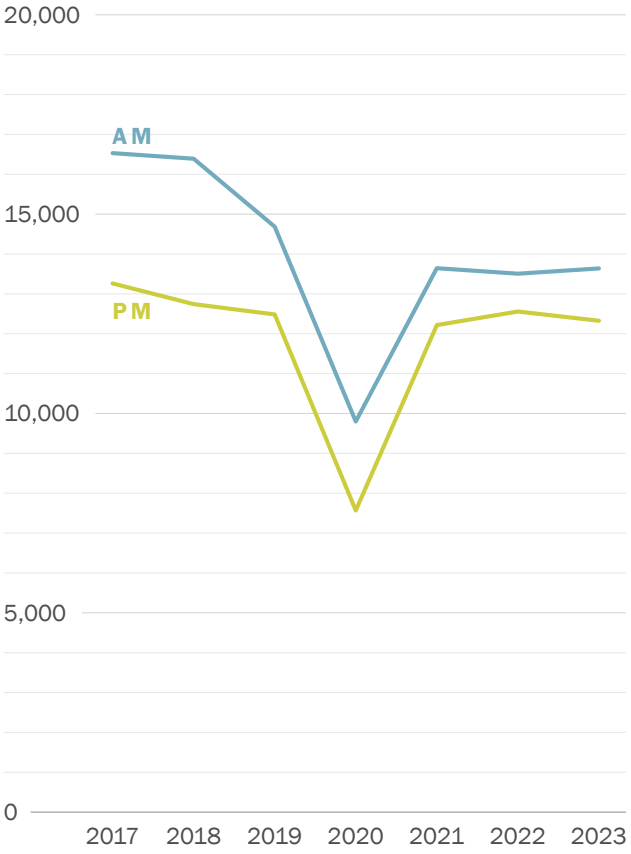
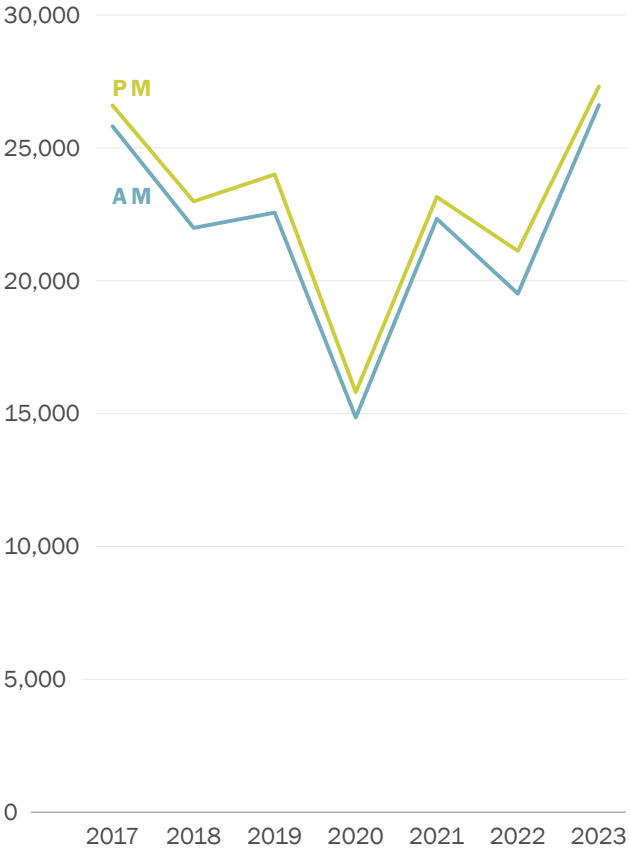


Figure 4-33. Weekday Peak Period Average Bay Bridge Screenline Volumes (Caltrans PeMS) (sum of Eastbound and Westbound) (Apr-May of each year)



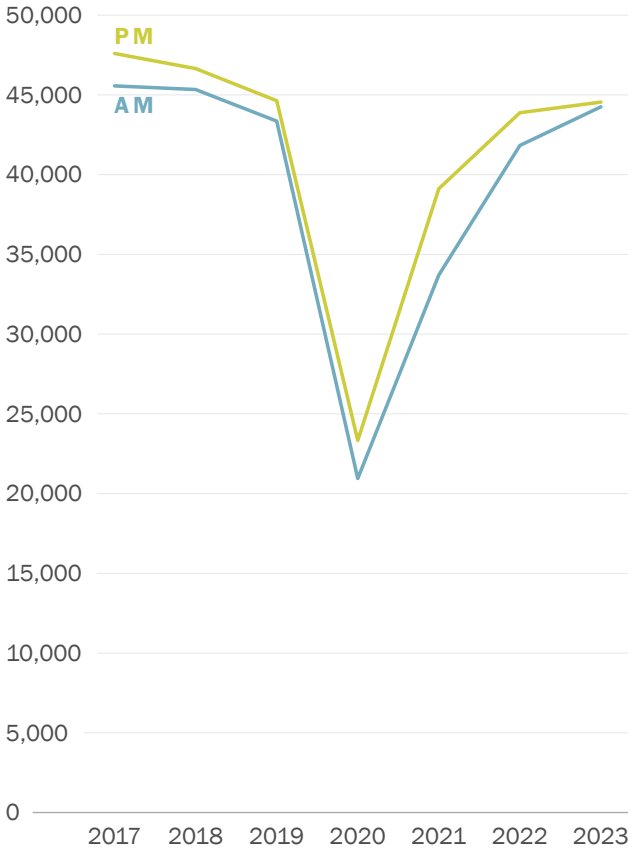
Notes:

Data from Caltrans PeMS

Data from 2017 to 2022 from the western span of the Bay Bridge; data in 2023 from the eastern span of the Bay Bridge (because there were no reported data from PeMS sensors on the western span by 2023)

Sensor data which are not directly observed (i.e. imputed volumes) are excluded

Figure 4-34. Weekday Peak Period Average US-101 and I-280 volumes at San Mateo Countyline (sum of Northbound and Southbound) (Apr-May of each year)



Notes:

Data from Caltrans PeMS

Sensors data which are not directly observed (i.e. imputed volumes) are excluded

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 4-16 summarizes the length of bicycle facilities by class. As of November 2023, the completed network included 467 miles of bike routes, of which 18% were Class I paths and 29% 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. Recently, SFMTA has been prioritizing the conversion of the existing network to higher-quality facilities rather than expanding the network itself. This mileage is not

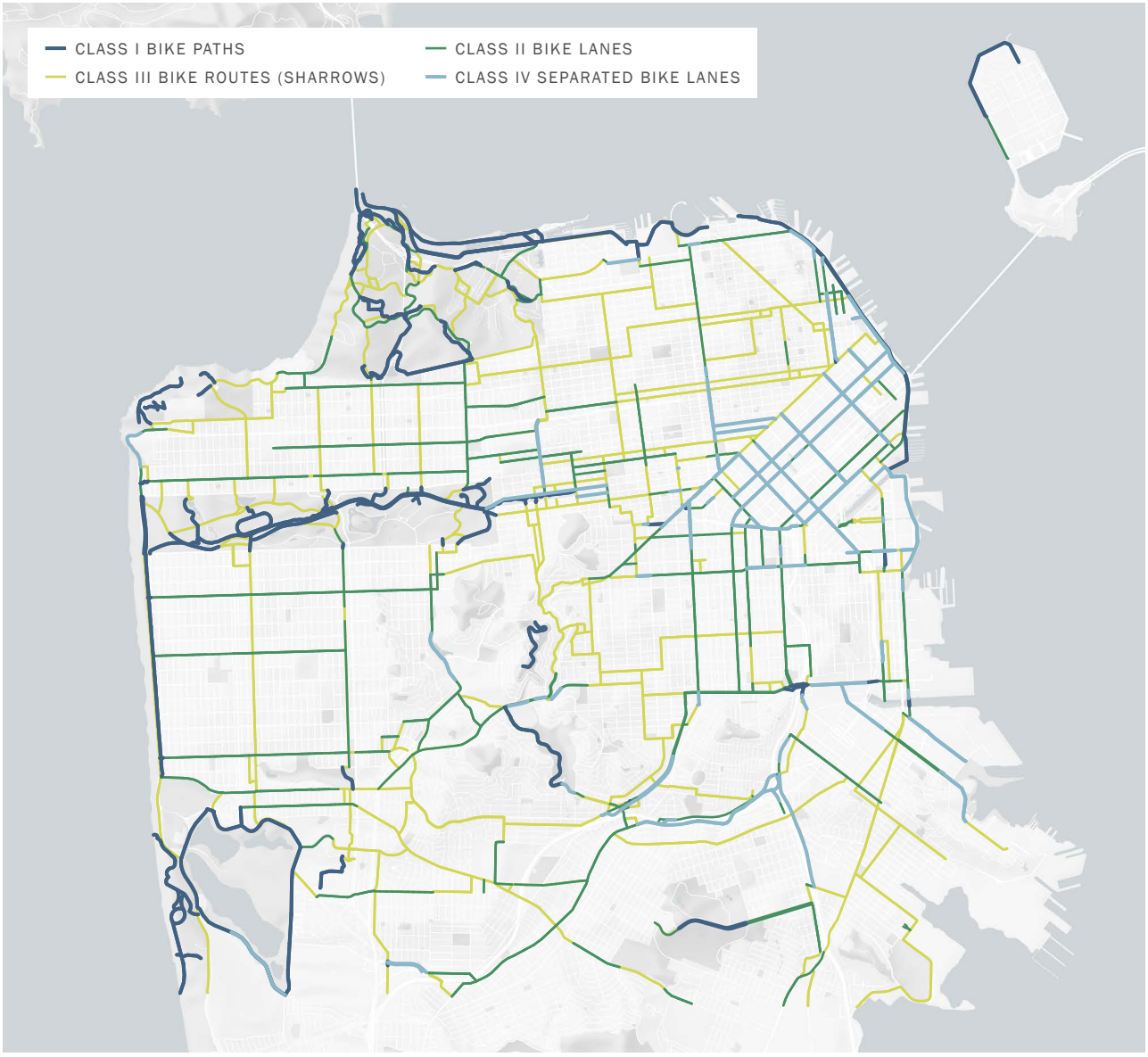
fully inclusive of Slow Streets (28 miles as of November 2023), which overlaps partially with the bike network presented in Table 4-16.

Table 4-16. Miles of San Francisco Bicycle Facilities by Class, 2013 to 2023

	2013	2015	2017	2019	2021	2023	% OF TOTAL BIKE NETWORK MILES (2023)
Class I Bike Path	60	60	62	78	78	86	18%
Class II Bike Lane*	125	133	137	136	139	133	28%
Class III Bike Route (Sharrows)	213	214	214	210	204	203	43%
Class IV Separated Bikeways**	15	16	16	28	42	45	10%
Total	**413**	**422**	**429**	**452**	**464**	**467**	

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

Figure 4-35. San Francisco Bicycle Network



4.5.7 PEDESTRIAN AND BICYCLE SAFETY

Safety for pedestrians and cyclists are key measures of 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. SafeTREC at UC Berkeley has developed the Transportation Injury Mapping System (TIMS) to provide easy access to SWITRS data. Table 4-17 and Figures 4-31 and 4-32 display traffic collision injury and fatality statistics by involved party for the recent years.[1]

The number of injury collisions (for both collisions involving pedestrians and those involving bicyclists) dropped significantly in 2020, probably due to the substantial reduction in vehicle and non-motorized volumes in 2020 due to the COVID pandemic. This reduction in the number of injury collisions continued past 2020 to 2022, even as traffic volumes have trended back up with the increase in travel activity (Figure 4-36). A similar reduction in the number of fatal traffic collisions happened in 2020. However, the number of fatal traffic collisions have increased to close to 2019 (pre-COVID pandemic) levels by 2022 (Figure 4-37).

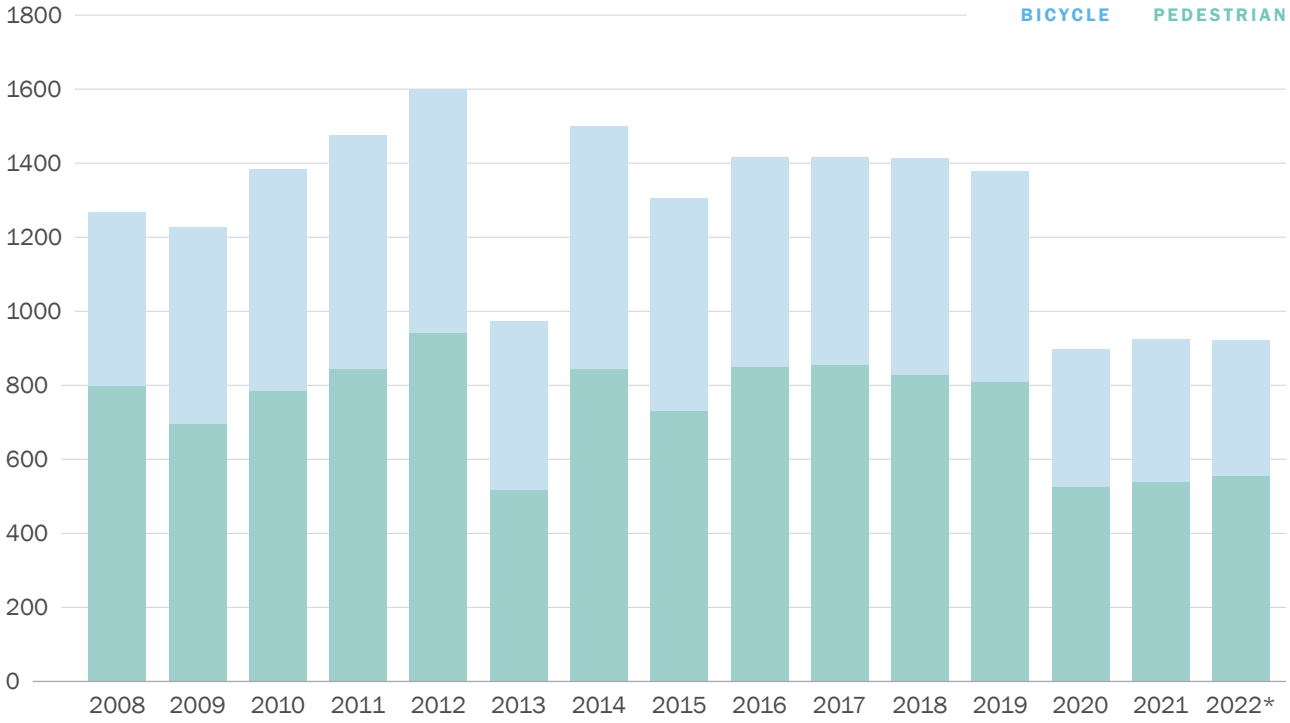
Table 4-17. Traffic Collision Injuries and Fatalities by Involved Party, 2012-2022

YEAR	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022*
Pedestrian Injury Collisions	942	518	843	731	850	854	828	809	524	538	555
Bicyclist Injury Collisions	658	454	657	574	566	562	584	568	374	386	365
Pedestrian Fatal Collisions	16	21	18	25	19	15	16	19	13	15	17
Bicyclist Fatal Collisions	2	4	2	4	4	2	4	1	1	1	2

Source: California Highway Patrol SWITRS / UC Berkeley SafeTREC TIMS;
* provisional data

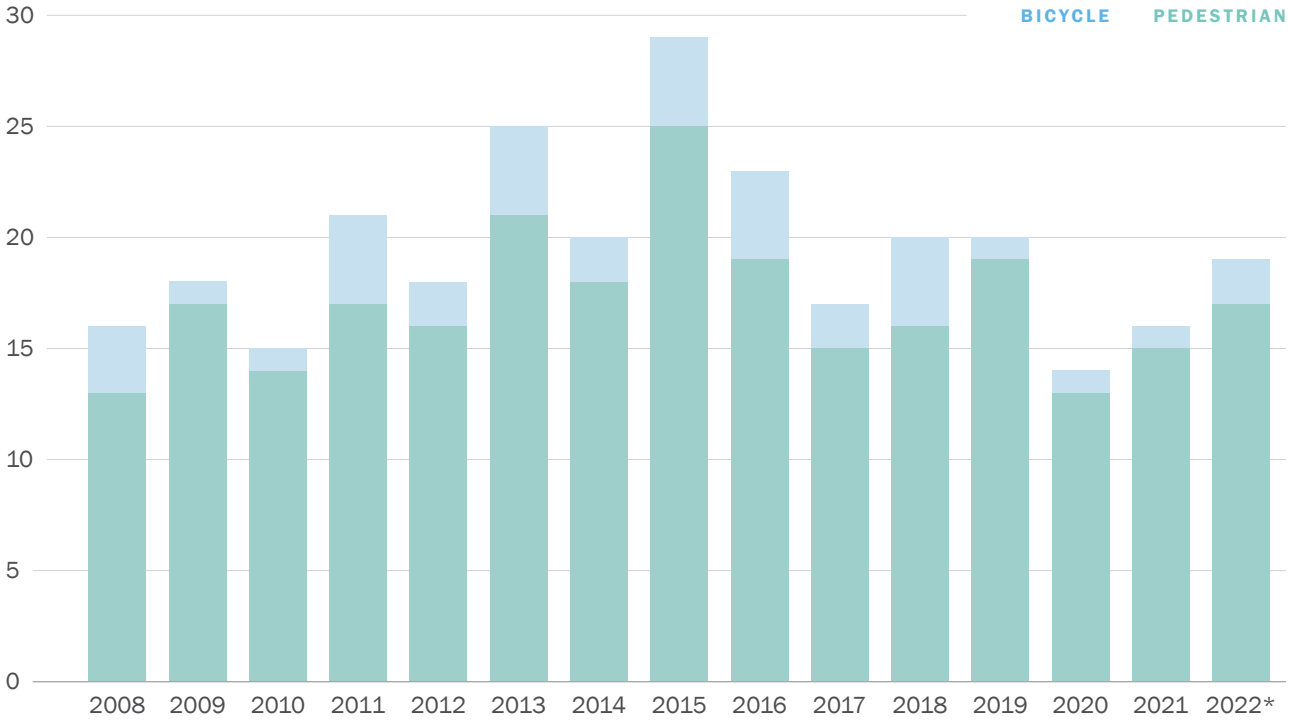
1 The fatal traffic collisions data in this report is sourced from the California Statewide Integrated Traffic Records System (SWITRS) maintained by the California Highway Patrol. The San Francisco Department of Public Health (SFDPH), San Francisco Police Department (SFPD), and the San Francisco Municipal Transit Agency (SFMTA) also independently reconciles traffic deaths using Office of the Medical Examiner's and SFPD data via the San Francisco Vision Zero Traffic Fatality Protocol. This can be found at: sfgov.org/scorecards/transportation/traffic-fatalities.

Figure 4-36. Injury Collisions Involving Pedestrians and Bicyclists in San Francisco



* provisional data.

Figure 4-37. Fatal Collisions Involving Pedestrians and Bicyclists in San Francisco



* provisional data.

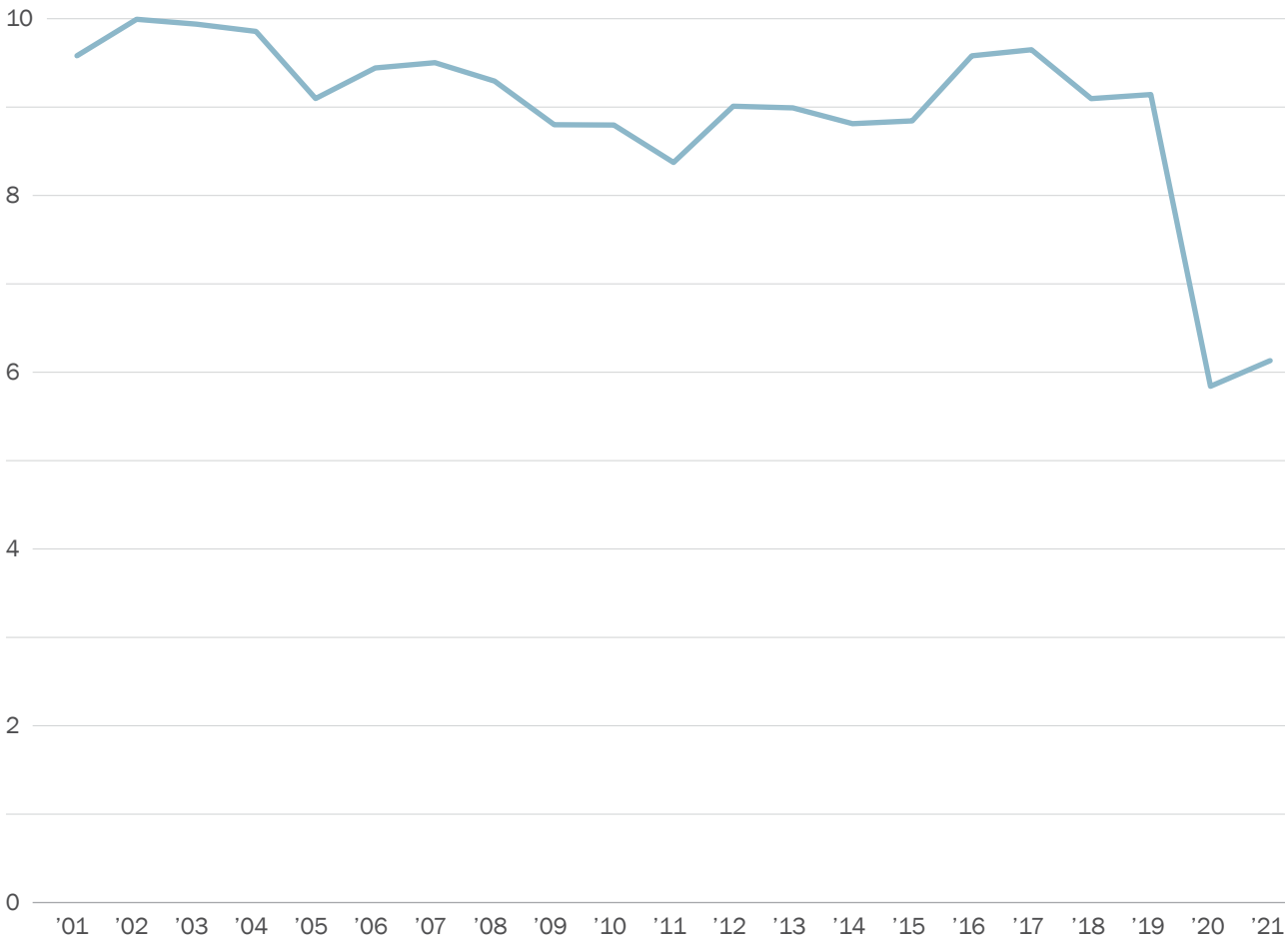
4.5.8 OTHER INDICATORS

In addition to the legislatively required performance measures and the local performance measures, several other metrics provide background and context for the transportation system's performance.

Vehicle miles traveled

In 2016, the San Francisco Planning Commission adopted new guidelines for evaluating the transportation impacts of new projects to implement California Senate Bill 743 (Steinberg 2013). Critically, environmental impact determinations are now based on vehicle miles traveled (VMT) rather than additional automobile delay as measured by level-of-service (LOS). VMT decreased by about 33% between 2019 and 2021 due to the COVID pandemic (Figure 4-36). Note that there is a two-year lag in this estimate provided by Caltrans.

Figure 4-38. Daily Vehicle Miles Traveled in San Francisco

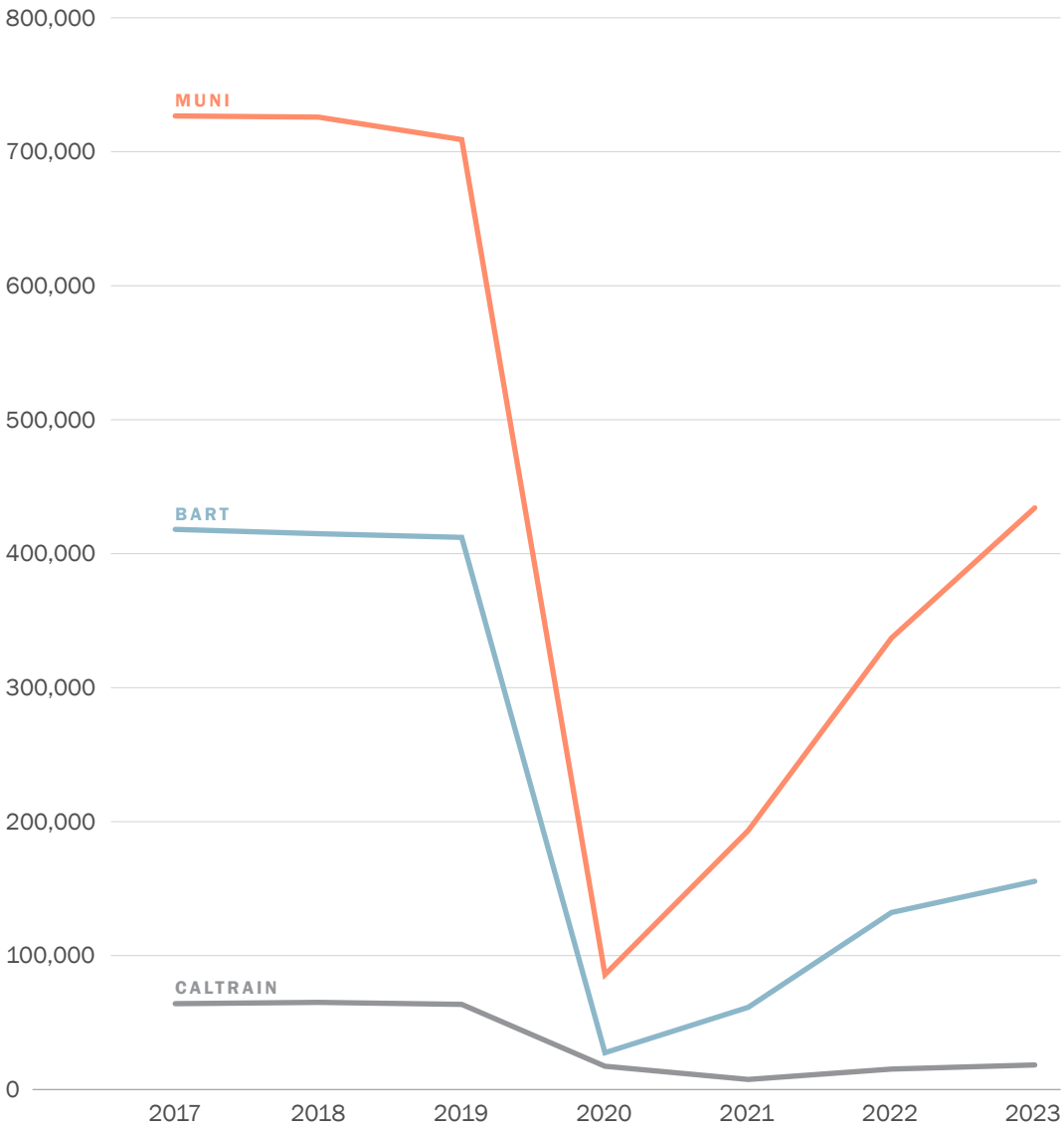


Source: Caltrans Highway Performance Monitoring System (HPMS)

Transit Ridership

Transit Ridership refers to the total boardings on transit services. Figure 4-37 shows recent ridership trends for the three largest transit systems serving San Francisco. Muni carries the greatest number of trips in San Francisco, with just over 400,000 trips on a typical weekday in 2023. Ridership on all three operators declined significantly with the spread of COVID in April-May of 2020. Since then, ridership has been gradually increasing every year, but in 2023 ridership is still significantly lower than pre-COVID pandemic levels, with Muni, BART, and Caltrain at 61%, 38%, and 29% of 2019 (pre-COVID pandemic) ridership respectively.

Figure 4-39. Average Weekday Daily Transit Boardings 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. Figures 4-35a and 4-35b 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, and To/From SF, which are trips where one of the trip ends is in San Francisco and the other trip end is not. 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%). These data were derived from a large-scale survey completed in 2019 prior to the COVID pandemic. This survey was deployed again in 2023 to continue the tracking of trends in mode shares on a more regular basis. However, the 2023 data is not yet available for inclusion in this report due to the data cleaning which is in process. An updated CMP report will be released when new survey data is available.

Figure 4-40. Mode Split for Intra-San Francisco Person Trips

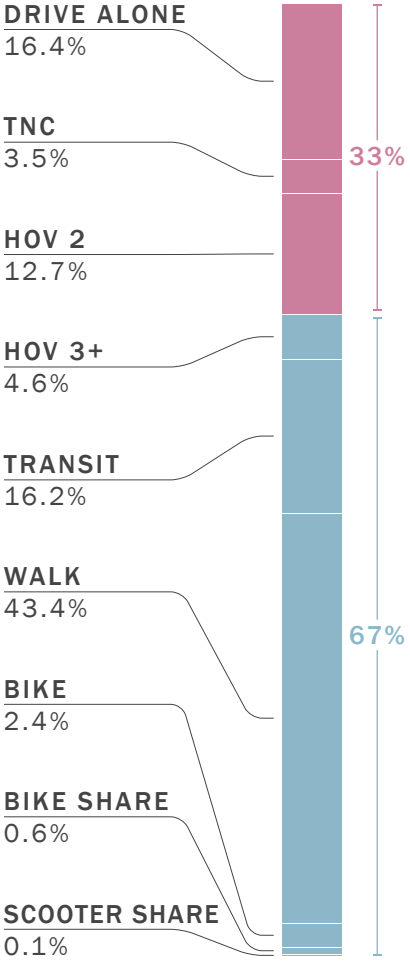


Figure 4-41. Mode Split for Regional To/From San Francisco Person Trips

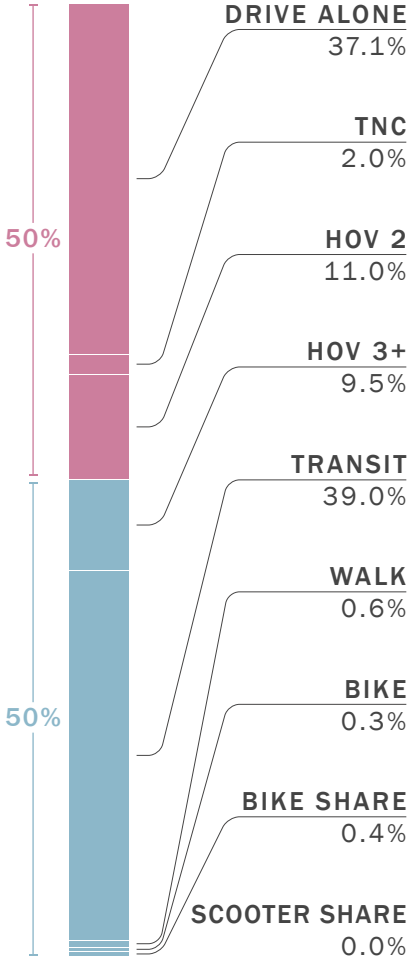
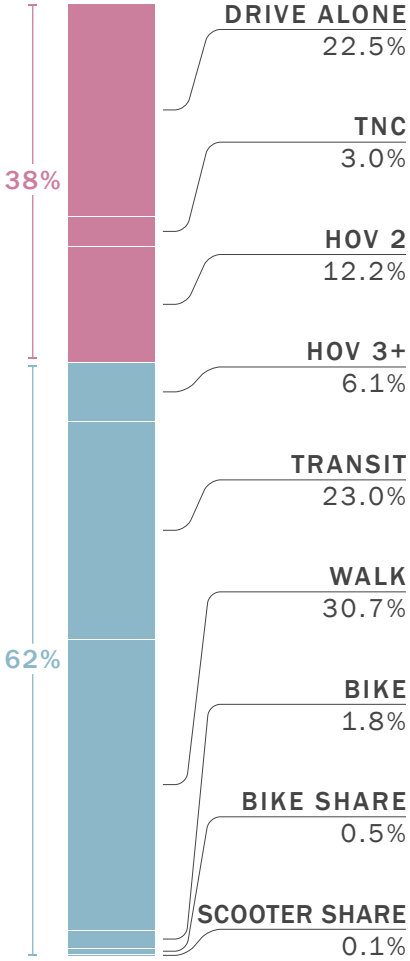


Figure 4-42. Combined mode split for Intra/To/From San Francisco Person Trips



4.5.9 MUNI PERFORMANCE GOALS AND METRICS

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 goals for Muni to attain. The SFMTA, through its strategic planning process, establishes its vision and values, and identifies the strategic goals and metrics in order to achieve this vision and uphold this set of values (SFMTA Strategic Plan). Refer to the SFMTA Strategic Plan and Performance Metrics web page (sfmta.com/performance-metrics) for details on each goal and metric.

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 2025.
- 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.
- Monitor transit travel times and reliability on the CMP network
- Monitor transit coverage metric and develop an interactive visualization for it.
- Coordinate with MTC to implement Continuous Travel Diary Survey Program that would provide sample data each year, and report travel mode shares using 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 the transportation system's performance. The most recent update to the San Francisco Transportation Plan, adopted in December 2022, focuses on prioritizing projects and programs and developing strategies to reduce risks to pedestrians and bicyclists, improve street conditions, reduce transit crowding and improve transit reliability, and improve

air quality. The Transportation Authority will, as part of its efforts to achieve these outcomes:

- Continue to participate in citywide pedestrian safety initiatives, including through the Pedestrian Safety Task Force, by coordinating with other City agencies to implement the VisionZero, WalkFirst and other strategies, and by supporting the City's traffic calming program.
- Coordinate with SFMTA on development and implementation of the bicycle network.
- Maintain and expand the Safe Routes to School program.
- Keep the overall maintenance of city streets in good condition and prepare for risks of climate change
- Bring transit priority to the busiest bus lines
- Bring Caltrain and future High Speed Rail to the Salesforce Transit Center
- 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.
- Dedicate Prop K funds to the design and implementation of complete streets enhancements that "Follow the Paving."
- Continuously improve the San Francisco Model's capability to model all modes of transportation, including bicycle and pedestrian trips.

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 is a systematic approach to shift how, when, and where people travel through programs and policies. TDM will maximize the infrastructure investment priorities defined in the San Francisco Transportation Plan 2050 (SFTP2050) and can reduce congestion by shifting more trips from driving alone to walking, bicycling/rolling, transit, or carpooling. TDM can include policies, low-cost capital improvements, 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.

1 California Government Code Section 65098 (b)(3).

San Francisco General Plan. The San Francisco General Plan includes multiple objectives relevant to TDM (included in Appendix 10). The General Plan includes a Transportation Element that is currently being updated to include TDM policies. 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.

San Francisco Transportation Plan (SFTP). Every four years, the Transportation Authority updates the city's long-range transportation plan. The Transportation Authority Board adopted the SFTP 2050 in December 2022. SFTP 2050 outlines how transportation funding in the city will be prioritized through 2050, with consideration for citywide goals as well as expected and potential revenues.
San Francisco Climate Action Plan (CAP). San Francisco's 2021 Climate Action Plan (CAP), a roadmap to achieving the city's goal of net-zero greenhouse gas emissions by 2040, outlines strategies to combat climate change within six sectors including transportation and land use. Strategies for reducing transportation emissions outlined in the plan include "creating a well-connected transportation network that shifts trips from automobiles to walking, biking, and other active transportation modes," with TDM recommendations for implementation.

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 working 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. The city has limited street space and, due to the costs of building major infrastructure, San Francisco is striving to make the most efficient use of this limited space by designating more space transit, walking, and biking/rolling, which can move more people in less space.

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 elements of the plan.

SFTP2050 included a policy initiative to plan for mode shift long-term. The TDM policy initiative includes a recommendation that San Francisco establish a vision and measurable goals for the future TDM strategy to guide development, implementation, and monitoring; identify priority geographic areas, trip types, travel markets, traveler types, and success metrics to guide program selection and implementation details; and provide guidance for how to incorporate ongoing evaluation to track impacts on modeshift and cost effectiveness and guide future TDM investments. The next steps to advance this policy initiative is to complete a TDM Market Analysis (led by SFCTA) and update the TDM Strategic Plan (a joint effort between SFCTA and SFMTA).

The TDM Market Analysis will use post-pandemic travel data to identify key neighborhood-level travel markets that are best suited for TDM investments—whether because of trip types, travel distance, transit effectiveness, surrounding land uses, or inequities in the transportation system; establish achievable neighborhood and/or market-level targets for overall TDM effectiveness; and guidance for program implementation—which TDM programs support existing travel patterns and needs. This effort will inform the update to the 2017 TDM Strategic Plan, which will define priority TDM actions to advance in the near-term. The recommendations of these two efforts will define funding priorities for the 5-year prioritization of Prop L funds.

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 and would be updated in the forthcoming TDM Market Analysis and TDM Strategic Plan Update.

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 recently completed, TDM-related studies and planning efforts where the Transportation Authority played a significant role.

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.

School Access Plan: In 2023, the Transportation Authority adopted the School Access Plan for San Francisco which recommends transportation solutions for K-5 students and their families. Solutions focus on children and caregivers who are burdened by medium- and long-distance trips to school and afterschool activities, and seek to close equity gaps and provide sustainable transportation options to help reduce vehicle travel. The plan builds 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: Prior to the pandemic, SFMTA initiated an effort 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. However, this effort is on pause in light of the commuting changes caused by the COVID-19 pandemic, and will be rescoped.

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:

- 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, an on-island shuttle, 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.
- Pursue funding for and partner with SFUSD and DCYF to implement the recommendations of the School Access Plan to study strategies to manage medium to long-distance travel for students to school.
- Implement the TDM recommendations in the SFTP 2050: complete the TDM Market Analysis and TDM Strategic Plan Update to guide future Prop L investments with a goal of increasing the effectiveness of TDM programs and impact of transportation investments.
- 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 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.

The Transportation Authority adopted SFTP 2050 in December 2022, as Phase 3 in the ConnectSF long-range planning process. Connect SF 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. ConnectSF developed a long-range vision for 2065 that served as the underpinning of 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 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 use of Vehicle Miles Traveled as a primary metric for determining traffic related environmental impacts, review of land use projects is now 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 VOTER 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." Voters approved the Prop L sale tax in 2022 to supersede Prop K and the Prop L Expenditure Plan which will continue this legacy of coordinating land use and transportation through investments from its Transportation Systems Development and Management category, including the new Development Oriented Transportation program.

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;

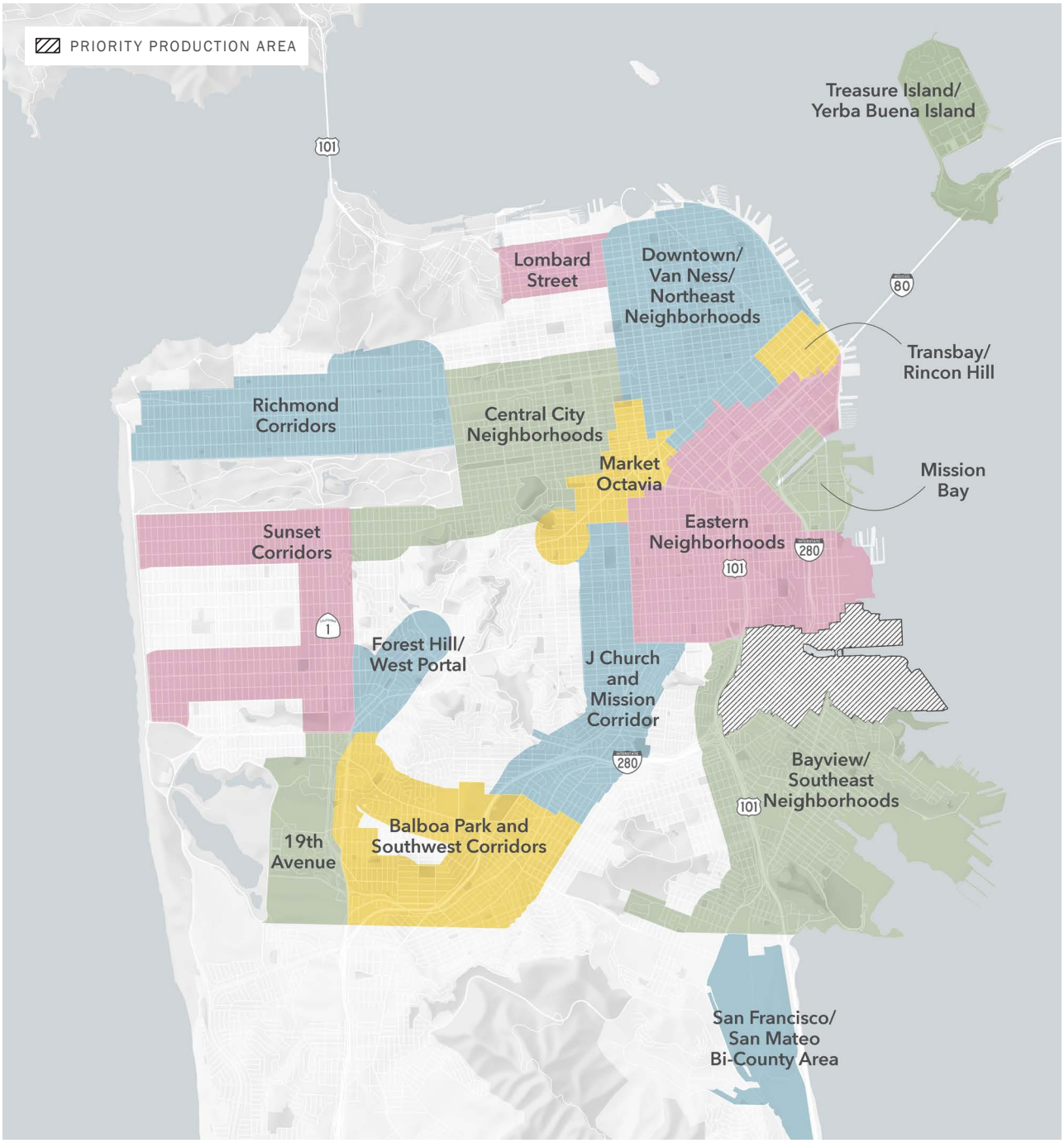
- Promote legislative activities that encourage smart growth, more sustainable transportation and development-related investment decisions by the City and developers, and also more efficient travel decisions by all transportation system users;
- Coordinate county-level input into the regional Sustainable Communities Strategy (SCS), the RTP, and related regional land use planning efforts;
- Conducts 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). 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 2019 in support of the recently adopted Plan Bay Area 2050. San Francisco has identified fifteen PDAs (Figure 6-1) and four Priority Conservation Areas (PCAs). Additionally, ABAG approved three additional regional PCAs that touch San Francisco.

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 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 first adopted San Francisco's IOZ on December 8, 2009. Under SB 1636, 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 regional transportation plan (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.

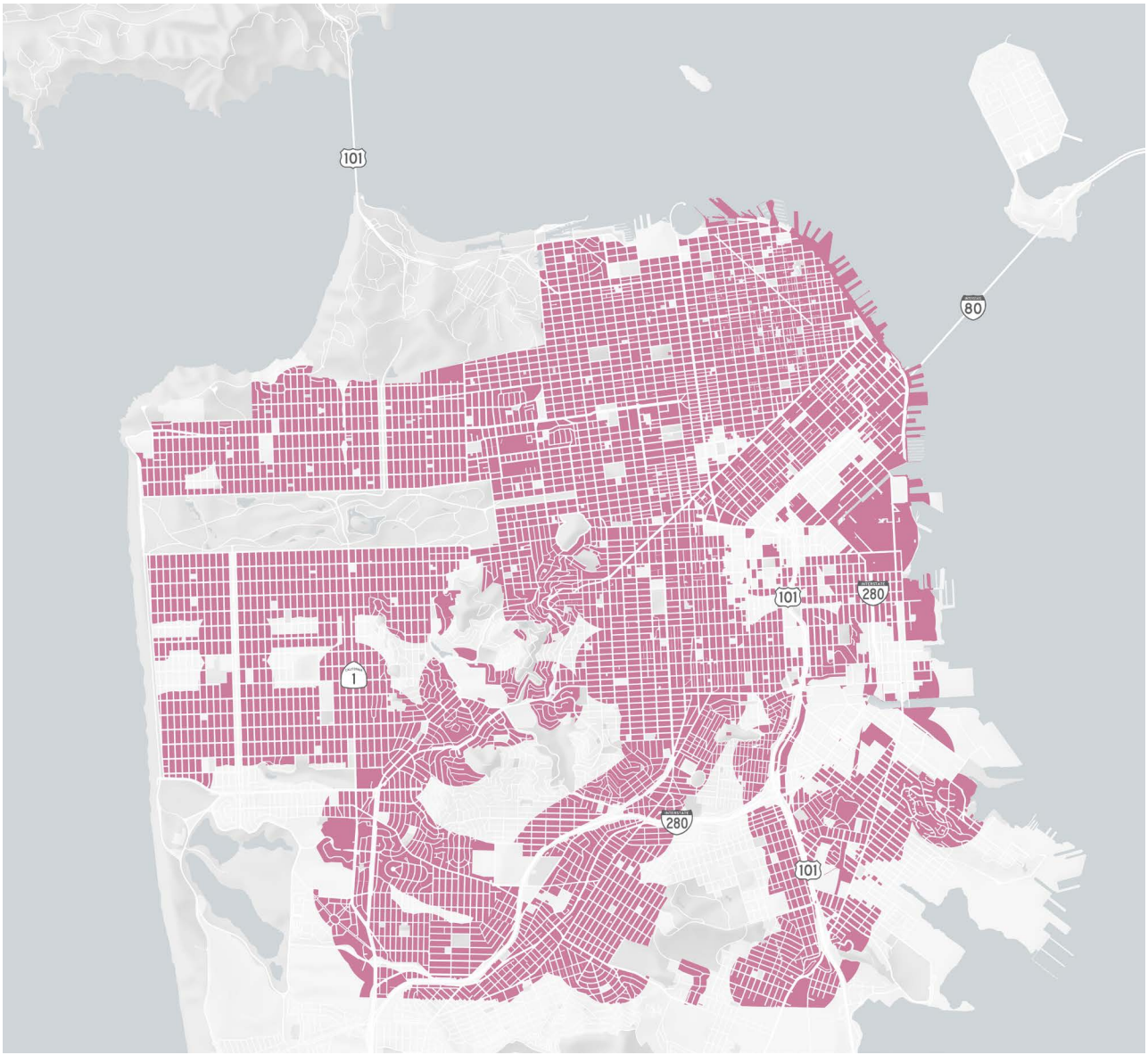
SB 743 (Steinberg 2013) revised the criteria to designate an IOZ. An area may be designated as an IOZ if it is:

- within one-half mile of a major transit stop or high-quality transit corridor (defined as a corridor with fixed route bus service with service intervals no longer than 15 minutes during peak commute hours) included in a regional transportation plan (RTP);

- consistent with the general plan and any applicable specific plan; and
- a "transit priority area" within a sustainable communities strategy or alternative planning strategy adopted by the applicable metropolitan planning organization.

The Transportation Authority intends to work on updating the IOZ in San Francisco to align with state legislation under SB 743 before the next CMP cycle.

Figure 6-2. San Francisco IOZ



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.

6.4 Neighborhood Transportati on 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. Since the authorization of Prop K in 2003, the Transportation Authority, working with other agency partners, has completed more than a dozen 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 Program (NTP), a Proposition L funded program established to support community-based neighborhood-scale planning efforts and transportation improvements in San Francisco neighborhoods, especially in underserved neighborhoods and areas with vulnerable populations (e.g. seniors, children, and/or people with disabilities). The NTP has a planning component to fund community-based planning efforts in each Supervisorial district, and a capital component intended to provide local match to help advance and implement capital investment and pilot recommendations stemming from NTP and other community-based planning efforts. The goal of the program is to help neighborhoods 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).
- Adopt Five Year Prioritization Programs (5YPPs) for Prop L funding as the first step in implementing the transportation improvements recommended in 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 programming of One Bay Area Grant (OBAG) funding.
- Continue development of the Neighborhood Transportation Program's efforts to support planning and capital projects.
- Coordinate with city partners to regularly update the Transportation Investment in Growth Strategy (updated in 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 L AND AA EXPENDITURE PLANS

San Francisco voters in November 2022 approved Proposition L, the half-cent sales tax for transportation, and adopted a new 30-year Expenditure Plan, superseding the Proposition K sales tax on April 1, 2023. The 30-year Expenditure Plan directs $2.6 billion (in 2020 $'s) to a list of transportation projects that are intended to help implement the long-range vision for the development and improvement of San Francisco's transportation system, as articulated in the San Francisco Transportation Plan (SFTP) 2050. 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 L 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.

7.3.1 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

7.3.2 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 L and Prop AA revenue estimates and advise on financial strategies
5. Develop Prop L 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 L, the Prop AA, 50% of the TNC 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 L 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 (TNC 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 of 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. 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 L, Prop AA, and TNC 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.

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. DTX, Bayview Caltrain Station locations,, 101/280 Managed Lanes Study, Brotherhood way, Treasure Island Mobility Management Agency support, and other ongoing projects will depend heavily on modeling support.
- Continue refinement of CHAMP 7 calibration and validation, including development of post-COVID baseline scenarios
- Cemplete data collection and analysis of large scale travel diary survey being collaboratively led by SFCTA, MTC, and SCVTA.
- Continue to support the development of ActivitySim, an open-source, public agency-supported implementation of an activity-based travel demand model.

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