CONGESTION MANAGEMENT PROGRAM DECEMBER 2021

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. By statute, the CMP legislation originally focused its requirements on measuring traffic congestion, specifically through Level-of-Service (LOS), which grades roadway facilities by vehicle delay. The SFCTA has since evolved its CMP to include more multimodal and system performance monitoring, in keeping with San Francisco's Transit First Policy, and in recognition that automobile-focused metrics such as LOS result in a limited view of transportation issues, which can result in inefficient, modally biased, and often, unintentionally, counter-productive solutions.[1]

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 2021 San Francisco Congestion Management Program is to:

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

The past year and a half are without precedent in the past century, as the COVID pandemic disrupted peoples' health, livelihoods, activities, and the economy overall. These changes have, in turn, had a profound effect on peoples' travel, as shelter-in-place orders reduced the number and type of activities people were able to participate in publicly, as employers responded with reduced workforces and with the widespread implementation of telecommute policies for some types of workers, as some residents relocated (at least temporarily) to other parts of the region, state, and country, and as transit agencies reduced and reconfigures service offerings. All of these changes, as well as many others, affected the performance of San Francisco's transportation system, as reflected in this

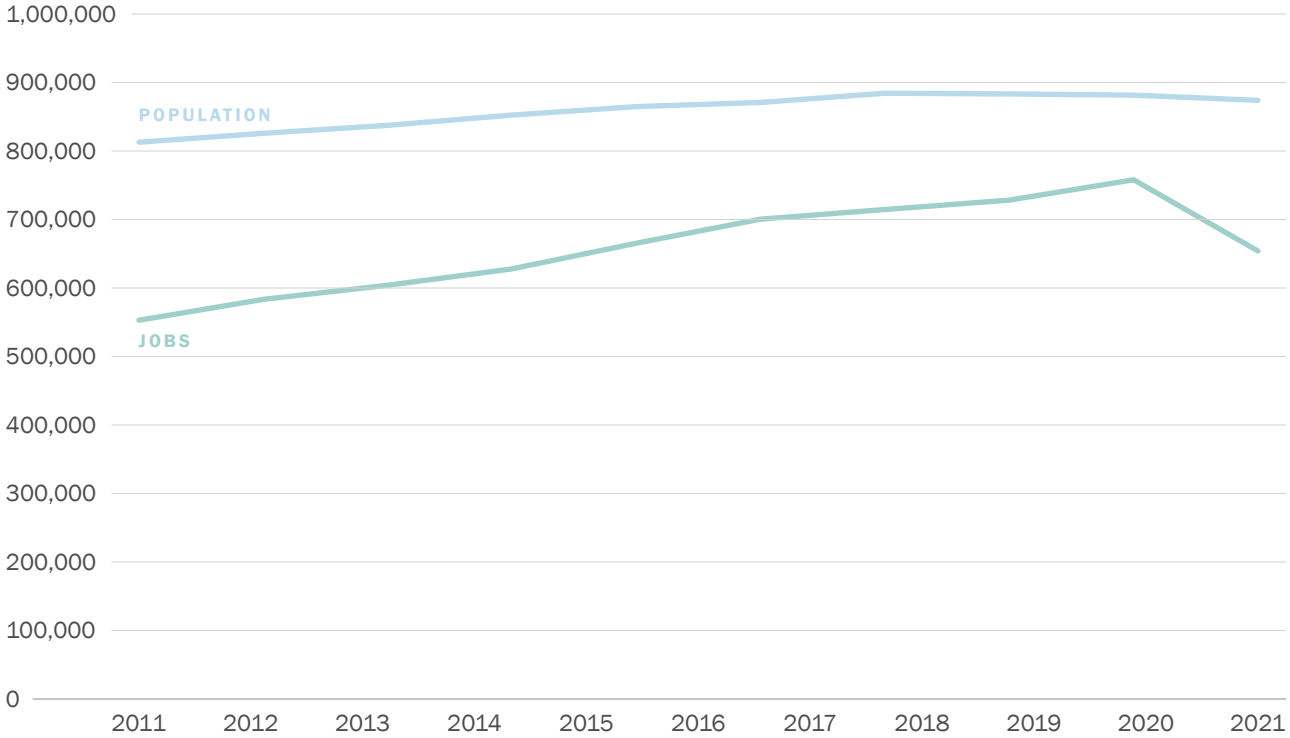
1 In order to reduce vehicle delay and improve LOS, without considering strategies that encourage shifts to other modes, the increased roadway capacity is the implied solution, which, in turn, has been shown to lead to more driving (induced demand).

update to San Francisco's CMP. The following sections document the unique changes observed over the past year. This report presents a wide variety of multimodal metrics that have been previously reported, such as roadway travel times, transit travel times, transit reliability, vehicle miles travelled (VMT), pedestrian and bicycle counts, and safety. It also introduces a few new measures, including roadway travel time reliability, transit coverage, and mode shares. Wherever possible, the document presents longer term trends so as to provide readers additional context to help understand current conditions.

State of Transportation

San Francisco has been an employment and population hub in the Bay Area, and in the decade prior to the COVID pandemic experienced tremendous growth (see Figure 0-1). Between 2011 and 2019, job growth significantly exceeded population growth in San Francisco by a factor of more than three to one, with over 200,000 new jobs and 60,000 new residents added during this period. However, as a result of the COVID pandemic these growth trends were halted and reversed, with employment dropping for the first time in over a decade, and population declining as well. More than 100,000 jobs were lost between 2019 and 2020, though there are indications that employment is increasing in recent months as the spread of COVID is curtailed and the economy reopens.

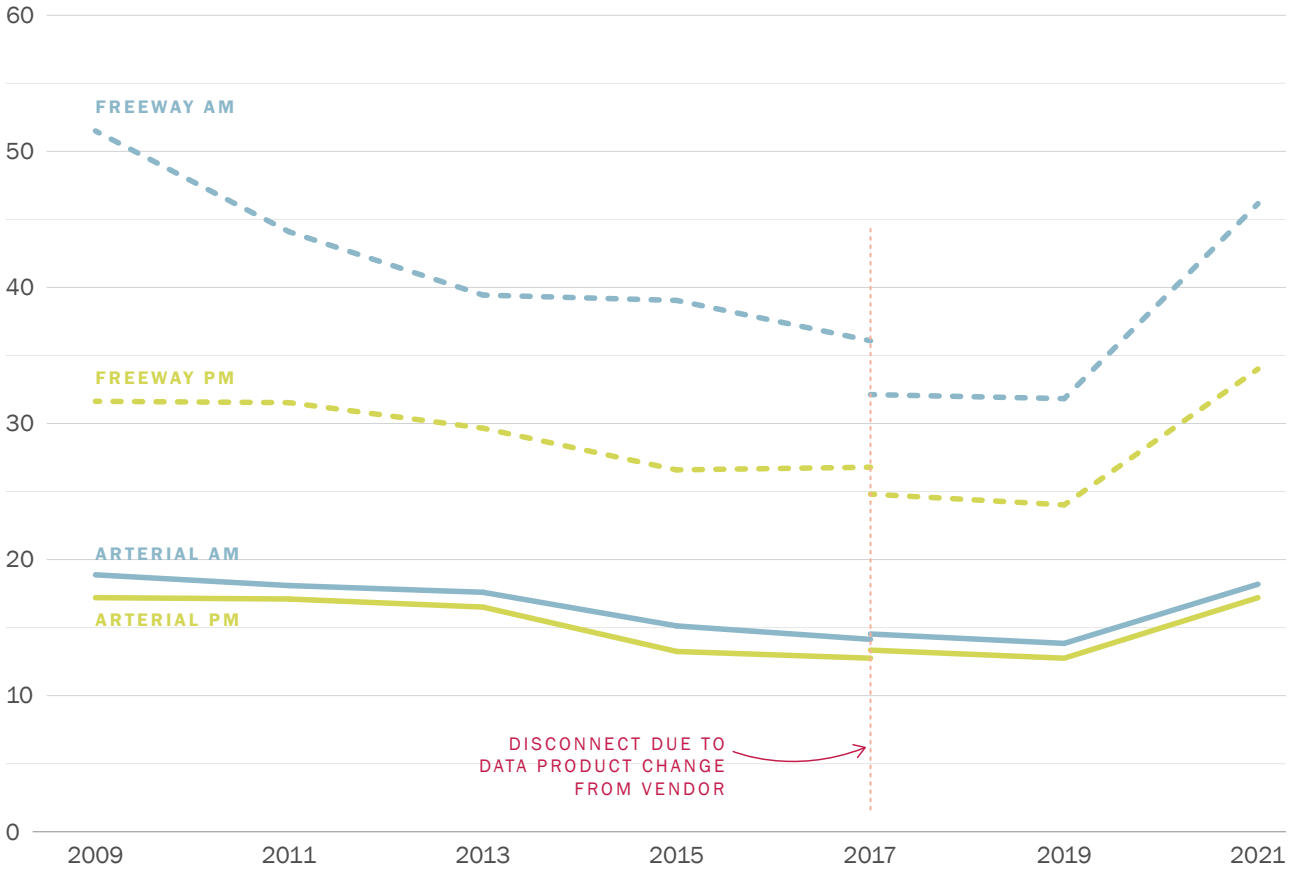
Figure 0-1. San Francisco Population and Job Growth since 2011



ROADWAY LEVEL OF SERVICE 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. For the current monitoring period, average travel speeds on the CMP network have increased since 2019 for all measured time periods and road types, as shown in Figure 0-2. This represents the first time in the past decade when overall average roadway speeds have improved between CMP updates, and are certainly attributable to greater levels of remote work and telecommuting, reductions in activity participation by individuals due either to personal preference or restrictions, reluctance to use public transit, and overall higher levels of unemployment. Average arterial travel speeds have increased 33% from 13.3 mph to 17.7 mph in the AM peak and increased 36% from 12.2 mph to 16.7 mph in the PM peak. The average travel speed on freeways increased 46% from 31.5 mph to 46.0 mph in the AM peak and increased 42% from 23.6 mph to 33.7 mph in the PM peak. The overall increases in speeds are a reversal in the trend of declining roadway performance observed during most part of this decade.

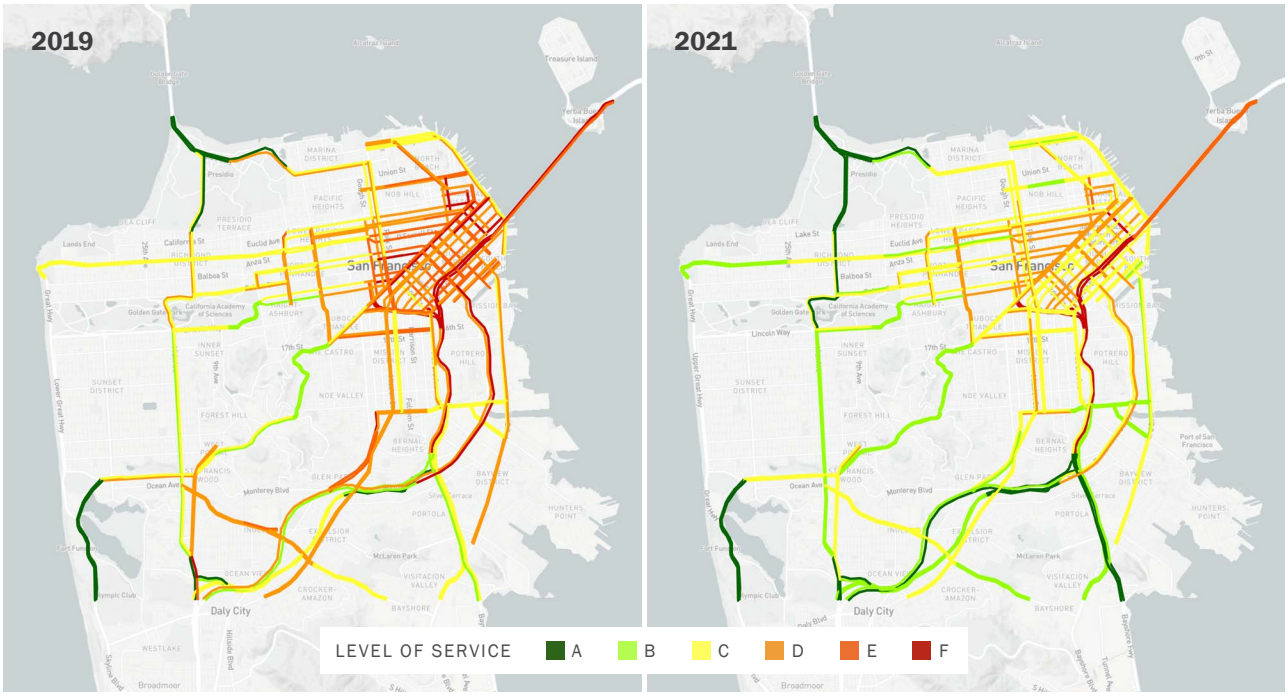
Figure 0-2. CMP Network Average Travel Speed Change



Note: data collected April – May each year

Figure 0-3 shows a comparison between LOS in 2019 and 2021 in the PM peak. There is significant improvement in the majority of Downtown arterials, as well as arterials in San Francisco's western and southern neighborhoods, but LOS is back to 2019 levels on several freeway segments. 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 congestion.sfcta.org.

Figure 0-3: 2019 and 2021 PM Peak Roadway Level-of-Service

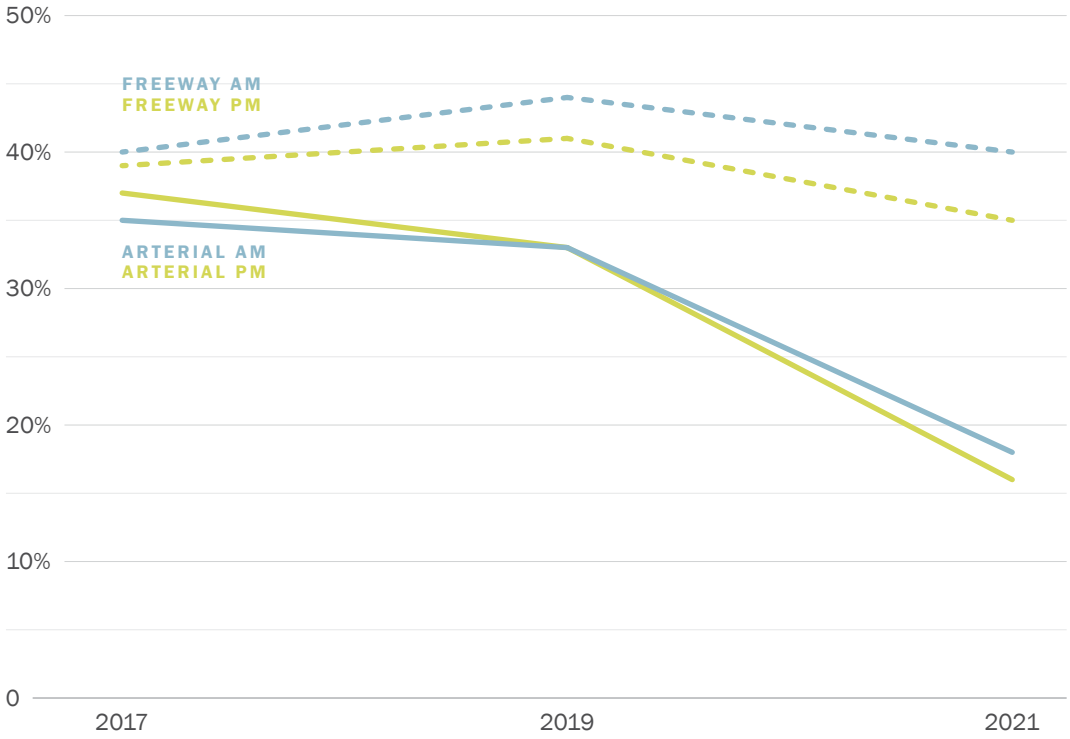


Note: data collected April – May each year

While the average travel speeds and LOS reported 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 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. In order to capture this aspect of congestion, a new metric for measuring roadway reliability is introduced in this CMP update called the Buffer Time Index (BTI). This is calculated as the amount of extra travel time (expressed as a percent of average travel time) that the travelers need to additionally budget so that they have a 95% chance of arriving on time. In other words, it is the buffer time needed if one does not want to be late more than once a month. Like auto speed, reliability has improved significantly

from 2019 to 2021 (Figure 0-4). Note that a lower value of BTI indicates higher reliability. For example, the BTI for arterials in the PM period was 33% in 2019, and 15% in 2021. This means that, on average, a traveler making a 20 minute trip of San Francisco arterials in 2019 would have needed to anticipate 6.6 minutes of extra time so as not to be late, while in 2021 they would have needed to anticipate only 3 minutes of extra time to not be late.

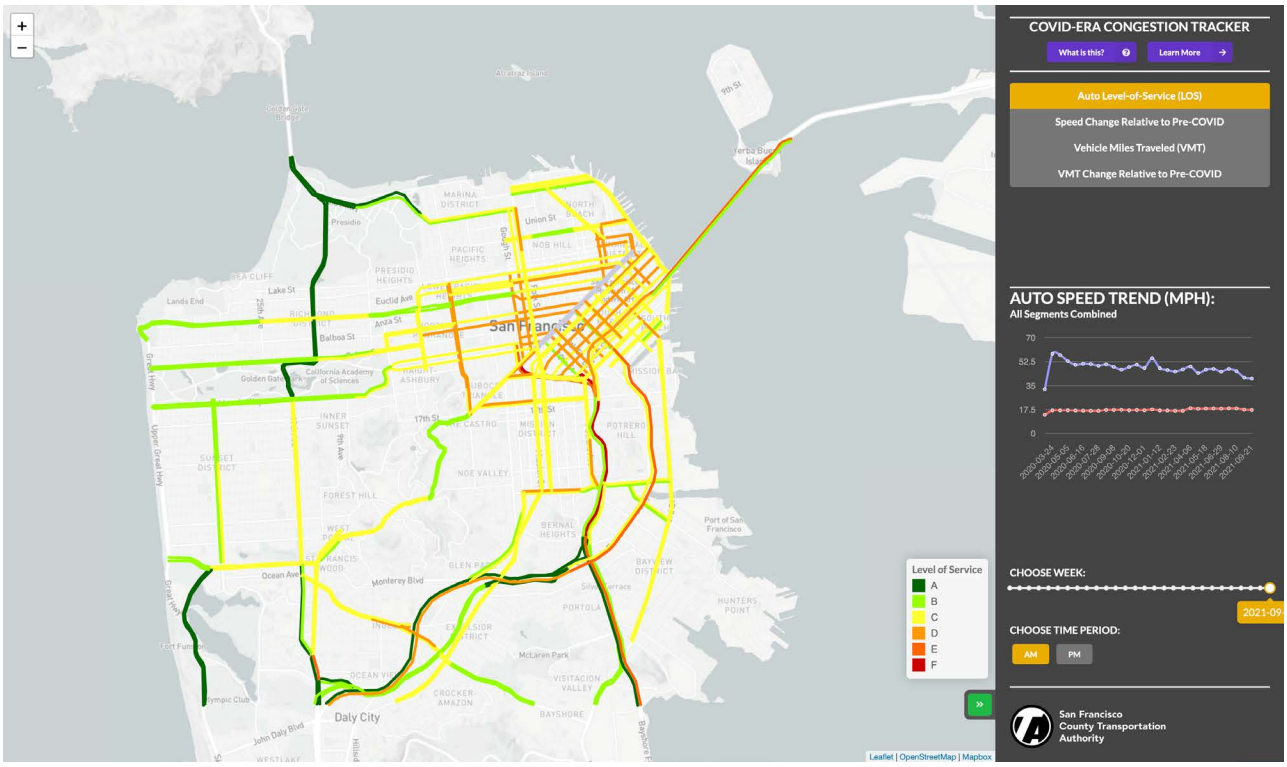
Figure 0-4. CMP Network Average Reliability (BTI) Change



Note: data collected April – May each year

Due to rapid and uncertain changes in traffic conditions after COVID, the Transportation Authority developed a new tool for short-term monitoring called the "COVID-Era Congestion Tracker" (covid-congestion.sfcta.org), shown in Figure 0-5. This tool tracks reports many of the same roadway performance metrics as reported the CMP congestion visualization, but with a much greater frequency (every three weeks instead of biennially) and over a shorter time frame (from March 2020 through the present instead of from Spring 1991 through Spring 2021). This tool is being used by the Transportation Authority and other City agencies to help inform pandemic recovery plans. While the biennial CMP monitoring, which is always performed in the spring of odd-numbered years, shows significantly higher speeds than past years (congestion.sfcta.org), the COVID-Era Congestion Tracker shows that since this past spring auto speeds on many streets have already dropped close to pre-pandemic levels and in some cases even slower than pre-pandemic.

Figure 0-5. COVID-Era Congestion Tracker



Source: https://covid-congestion.sfcta.org/

Strategies to managing congestion are key to maintaining our accessibility as the city recovers. These include: improving public transportation, bicycling and walking routes and facilities; coordinating new development to support walkable and transit-oriented neighborhoods; and managing vehicle use, parking, and traffic signals to ensure safety and efficiency.

TRANSIT SPEEDS

In addition to monitoring roadway speeds, the Transportation Authority also tracks surface transit speeds, and the ratio of private vehicle speeds to bus speeds, as our primary system performance metric. Transit speeds on the CMP network increased since 2019 (Figure 0-6). Compared to 2019, the average transit speed (collected for buses only) in 2021 increased 15% from 8.4 to 9.7 mph in the AM peak. In the PM peak period transit speeds also increased 24% from 7.6 to 9.4 mph. Like roadway speeds, most of the increase in transit speeds may be attributable to overall lower levels of demand due to reduced activity participation and increased telecommuting, which in turn increased travel speeds on the roadway network that the buses travel on. Improved transit speeds may be attributable also to increased deployment of transit priority lanes, and to less delay resulting from fewer boardings and alightings, during COVID-19.

TRANSIT TRAVEL TIME RELIABILITY

Transit speed information is also used to calculate the variability of speed as a measure of transit travel time reliability. Figure 0-7 shows that transit travel time reliability has worsened (variability has increased) since 2019 despite improvements in average transit speed. However, this worsening of travel time variability should be understood within the context of an overall improvement in transit travel speeds. For example, average transit performance improved from 7.6 mph and 21% variability in 2019 to 9.4 mph and 25% variability in 2021, which means approximately 70% of the time, a 3 mile transit trip in 2019 would take between 18.7 minutes and 28.7 minutes, while this same trip in 2021 would take between 14.4 minutes and 23.9 minutes. While transit was slightly less reliable in 2021, the overall improvements in transit speeds far offset this effect.

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. As shown in Figure 0-8, the average auto-transit speed ratio increased between 2019 and 2021. Both average auto and transit speeds improved this year but auto speeds improved more than transit speeds which resulted in transit being less competitive relative to auto.

MULTIMODAL VOLUMES

The SFCTA has placed a high priority on shifting travelers' modes to increase the number of trips made by walking and bicycling. Figure 0-9 and Figure 0-10 respectively show bicycle and pedestrian

Figure 0-6. Overall Average Transit Speeds Trend for CMP Network

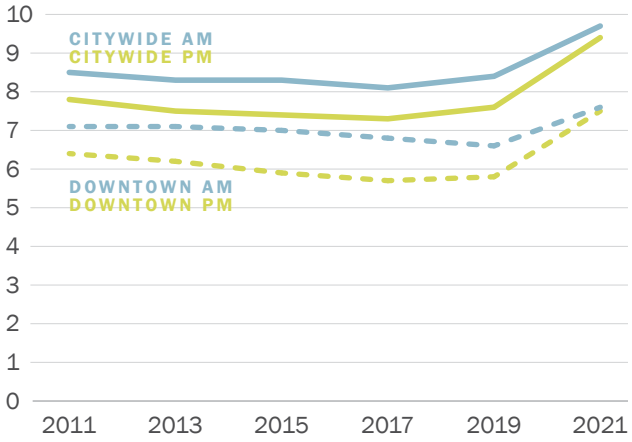


Figure 0-7. Transit Travel Time Reliability

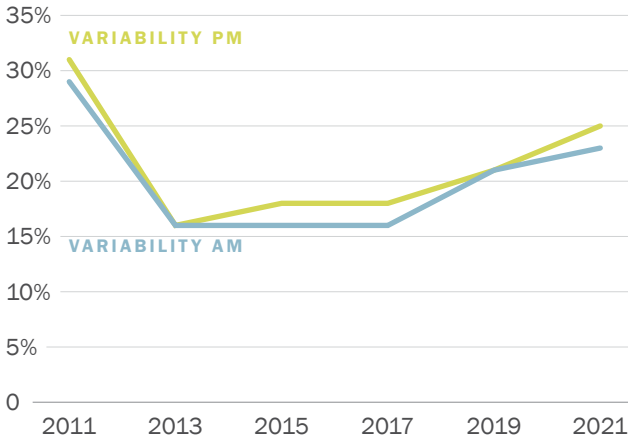
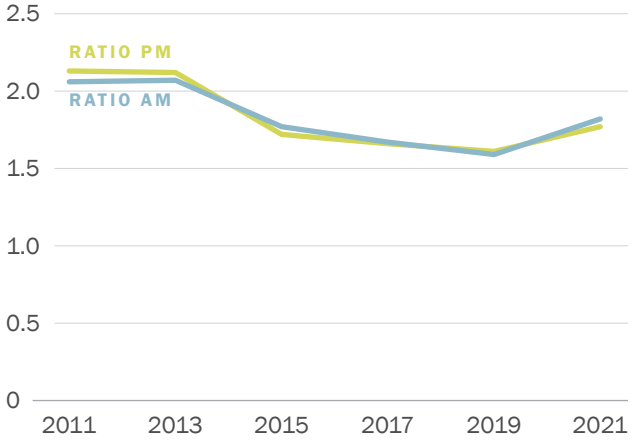


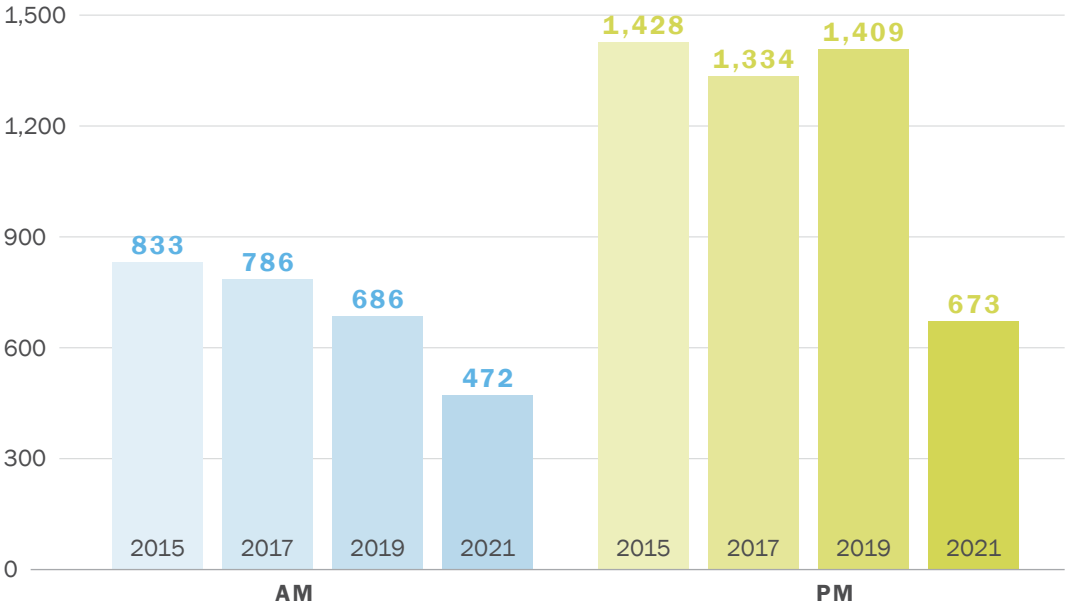
Figure 0-8. Auto-Transit Speed Ratio



Note: data for Figures 0-6, 0-7 and 0-8 collected April – May each year

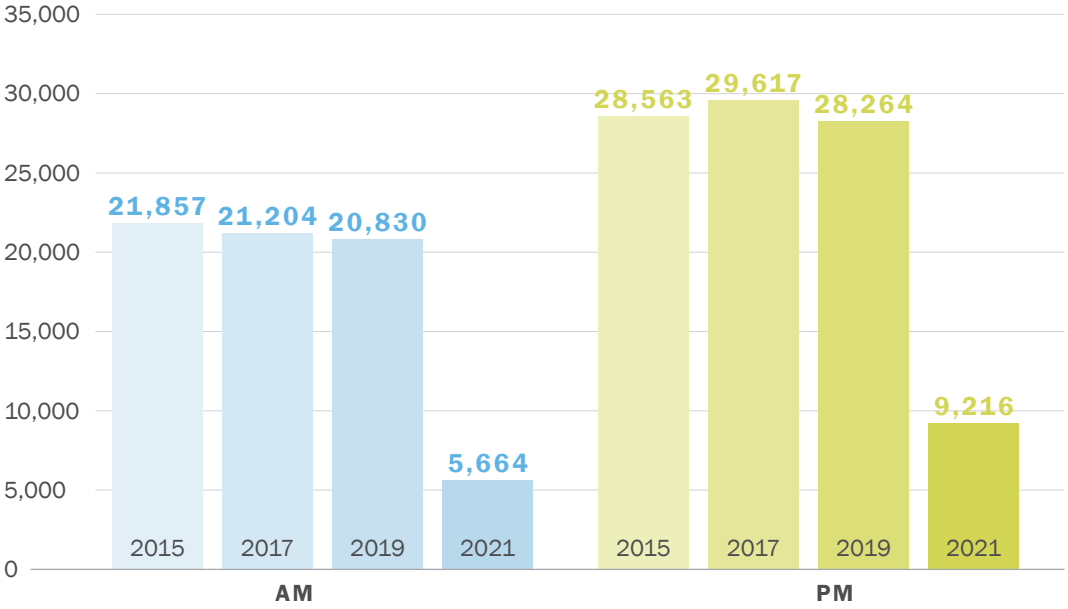
counts collected by SFCTA between 2015 and 2021. At these locations, bicycle and pedestrian volumes dropped by 45% and 70% respectively compared to a 22% reduction in vehicle volumes. All of these reductions are likely a reflection of greater levels of remote work and telecommuting, reductions in activity participation by individuals due either to public health-related personal preference or restrictions.

Figure 0-9. SFCTA Intersection Bicycle Counts 2015 – 2021



Note: data collected April – May each year

Figure 0-10. SFCTA Intersection Pedestrian Counts 2015 – 2021

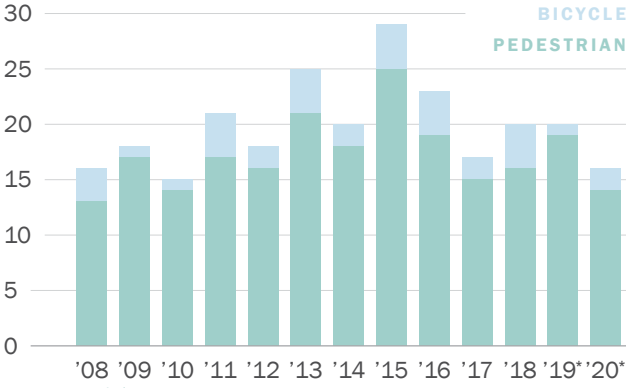


Note: data collected April – May each year

PEDESTRIAN AND BICYCLE SAFETY

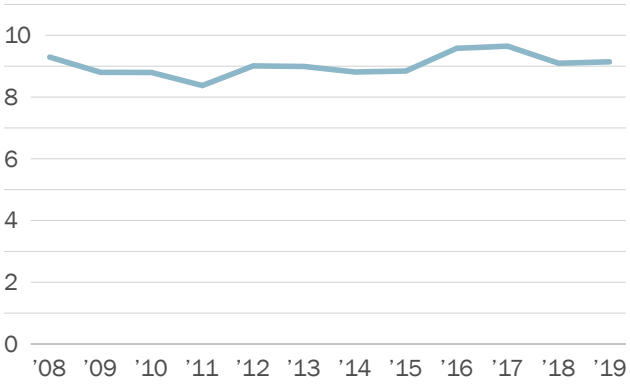
Safety for pedestrians and cyclists are key measures of non-motorized transportation performance, and a critical policy priority for San Francisco. San Francisco adopted Vision Zero as a policy in 2014, committing to build better and safer streets, educate the public on traffic safety, enforce traffic laws, and adopt policy changes that save lives. Figure 0-11 illustrates the number of pedestrian and bicycle fatalities in San Francisco since 2008. It shows that while pedestrian fatalities decreased between 2019 and 2020, there was an increase in bicycle fatalities in the same period. Overall, the total non-motorized fatalities were lower in 2020 than 2018 and 2019.

Figure 0-11. Pedestrian and Bicycle Fatalities



* provisional data

Figure 0-12. Vehicle Miles Traveled on all SF roadways (millions)



OTHER MEASURES

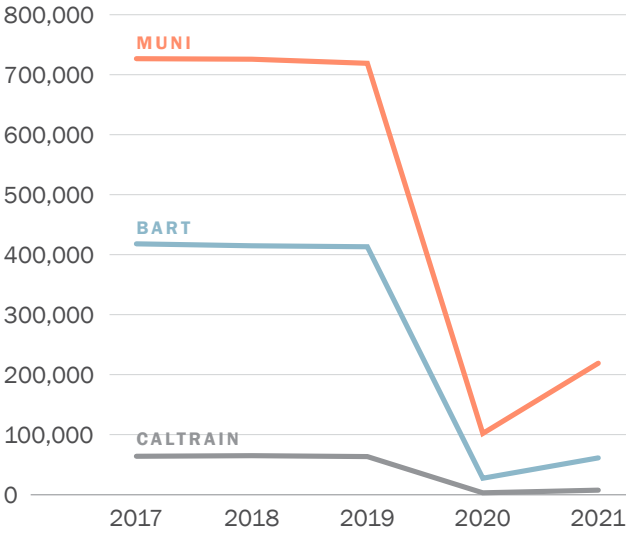
Vehicle Miles Traveled (VMT)

In 2016, the San Francisco Planning Commission adopted new guidelines for evaluating the transportation impacts of new projects. Critically, additional automobile delay as measured by level-of-service (LOS) is no longer considered an environmental impact, and environmental impact determinations now use vehicle miles travelled. Figure 0-12 illustrates the trend in estimated VMT on all San Francisco roadways. It shows that VMT dipped about 5% between 2017 and 2019. Note that there is a two-year lag in this estimate provided by Caltrans.

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 and around the city efficiently. Figure 0-13 shows ridership trends for the three largest transit systems serving San Francisco as of April – May

Figure 0-13. Average Daily Passengers by Transit Operator



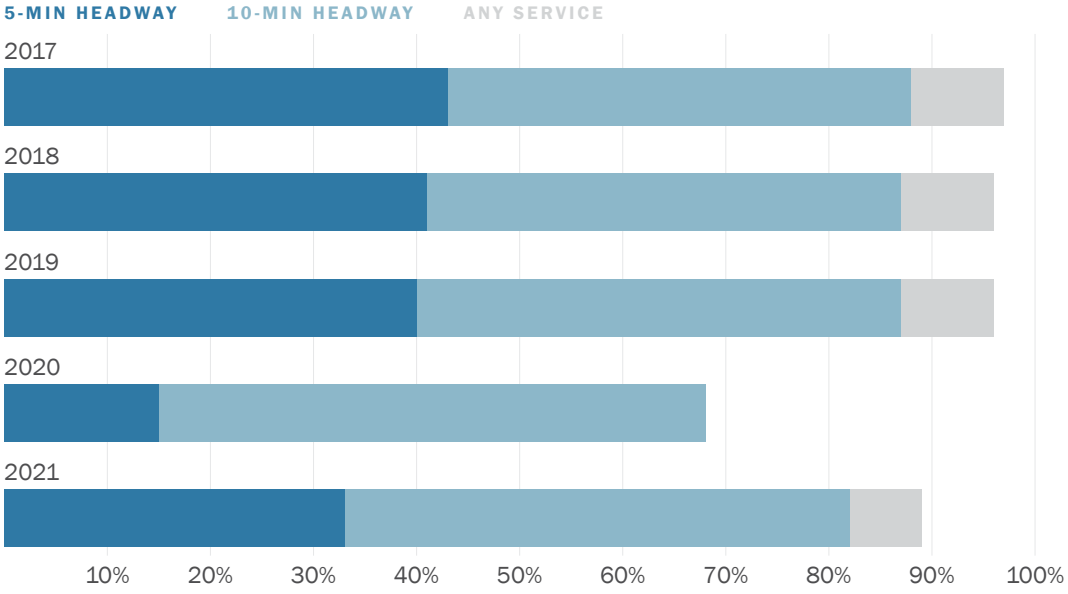
Note: data collected April – May each year except for Caltrain it is February

2021. Ridership on all three operators dropped significantly during shelter-in-place orders in April – May of 2020. Since then, ridership has been gradually climbing back up every month. More recent data indicates that ridership on Muni and BART has increased since the time of the data reported in this document but remains well below historical levels.

Transit Coverage

This year, a new metric to quantify and track transit coverage by walk access to different transit service frequency levels has been added to the report. This new transit coverage metric reports the percent of total population and total jobs that are within a 5-minute walk of transit service. Figure 0-14 shows transit coverage in terms of population for AM peak period. Prior to COVID-19, over 95% of the population had access to some level of transit service. During 2020, when substantial cuts to transit service were made, this was reduced to about 70%. In Spring 2021, as service was restored, 90% of the population had access to transit. Similarly, access to high-frequency transit (5-minute headway or better) dropped from 40% to 15% of the population between 2019 and 2020. This improved to over 30% in Spring 2021. Muni has proposed more service restoration in early 2022 that this analysis does not reflect.

Figure 0-14. Population Transit Coverage by Service, Weekday AM Peak



Note: data collected April – May each year

Mode Share

Mode share describes the mix of modes, such as transit, biking, walking, and driving, used to travel to, from and within San Francisco. Figure 4-35 and Figure 4-36 summarize the share of trips by mode for two different travel markets: Intra-SF, which are all trips that both start and end in San Francisco (3 million trips approx.), and To/From SF, which are trips where one of the trip ends is in San Francisco and the other trip end is not (1.5 million trips approx.). Walking is by far the most prevalent mode used to get around within San Francisco (43.4%), followed by various types of driving such as driving alone, sharing a ride, or using a TNC (37.3%), and using transit (15.8%). In contrast, travel to/from San Francisco is dominated by driving (59.6%), but with a large transit share as well (39%). Figure 0-17 shows mode shares for the two markets (Intra-SF and To/From SF) combined. These data were derived from a large scale survey completed in 2019 prior to the pandemic. The Transportation Authority anticipates that this survey will be deployed again in 2022/2023, so that trends in mode shares can begin to be tracked on a more regular basis.

Figure 0-15. Mode Split for Intra-San Francisco Person Trips

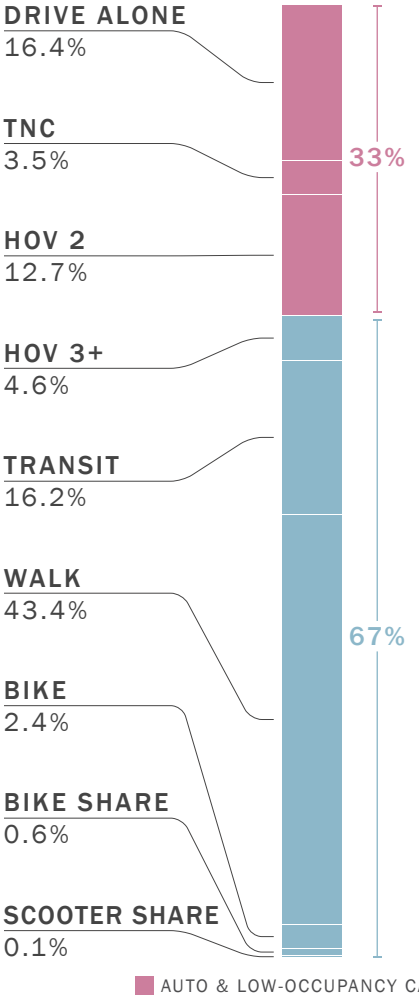


Figure 0-16. Mode Split for Regional To/From San Francisco Person Trips

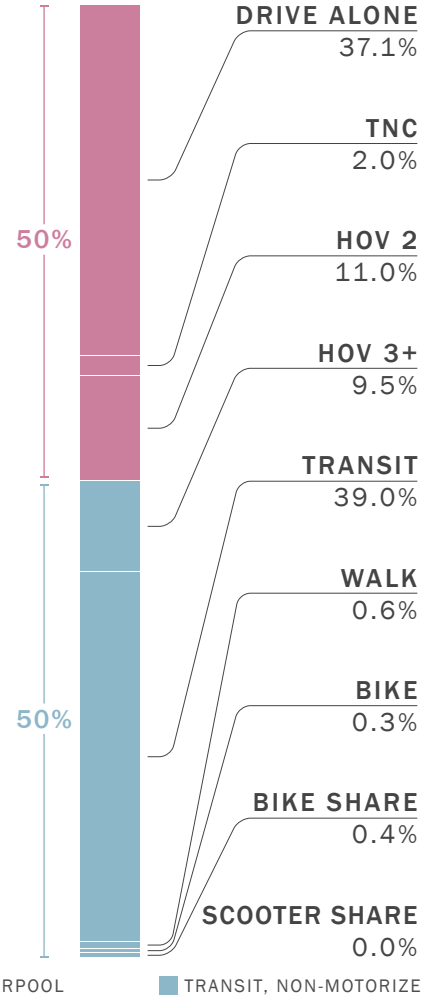
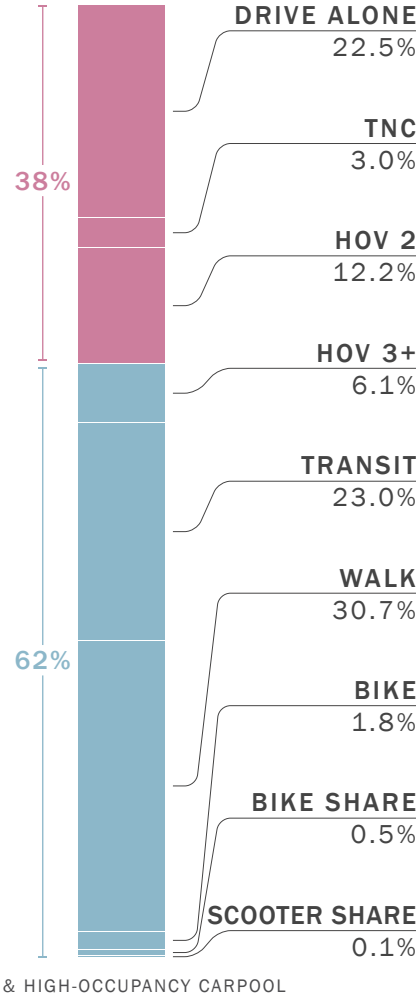


Figure 0-17. Combined mode split for Intra/To/From San Francisco Person Trips



What are we doing to manage congestion?

MANAGING DEMAND FOR TRAVEL

San Francisco has a multi-sector strategy for managing congestion, including land use, transit, bicycle & pedestrian investment & on-street prioritization, and demand management (including parking management, HOV/bus priority and in some locations, road pricing). These include a focus on new development as well as on managing congestion in existing neighborhoods and built up areas:

- Coordinating transportation aspects of area plans, development agreements, and other requirements on new development, including:
  - Central SoMa Land Use Plan
  - Central Waterfront development projects
  - Treasure Island, Hunter's Point /Shipyard, Schlage Lock, Parkmerced
  - Transportation Sustainability Program
- Policies and programs to manage trips in existing neighborhoods and built-up areas, including:
  - School Access Plan
  - SF Business Relocation TDM Project
  - Commuter Benefits Ordinance and Emergency Ride Home Program
  - SFMTA Commuter Shuttle Policy
  - SFMTA Carsharing Policy
  - SFMTA Bayview Community Based Transportation Plan
  - Travel Demand Management Ordinance
  - Downtown Congestion Pricing Study (paused until 2022)
  - Traffic Congestion Mitigation Tax
  - District 4 Mobility Improvements Study
  - Octavia Boulevard Circulation and Accessibility Study Update

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. The Transportation Authority prepared a Transportation Investment and Growth Strategy, which describes how San Francisco will support PDAs through transportation investment. This is currently being updated for December 2021. The city's use of Metropolitan Transportation Commission PDA planning funds is supporting the following planning efforts and studies in line with the Transportation Investment and Growth Strategy:

- PDA Planning Projects
  - Caltrain Southeast Rail Station Study
  - District 4 Mobility Improvements Study
  - Octavia Boulevard Circulation and Accessibility Study Update

- » Embarcadero Multimodal Design
- » Bayshore Multimodal Facility Location Study
- » M-Oceanview Realignment
- » Ocean Avenue Streetscape Plan
- » Market/Noe Streetscape Design and EIR update
- » Balboa Reservoir TDM
- » Transit Corridors Study (ConnectSF)
- » Streets and Freeways Study (ConnectSF)
- » Downtown/Van Ness (Central Corridor)
- » Treasure Island Mobility Management Study

PLANNING PROJECTS

ConnectSF is a multi-agency collaborative process to build an effective, equitable, and sustainable transportation system for San Francisco's future. ConnectSF has defined a 50-year vision of San Francisco's future that represents our priorities, goals, and aspirations as a city within the larger Bay Area. That vision is guiding plans for the city and its transportation system as agencies work to identify needed transit, streets, and highway improvements. ConnectSF developed a long-range vision for 2065 that serves as the underpinning of the next San Francisco Transportation Plan, 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:

- Vision Zero Program
- Caltrain Downtown Rail Extension to Salesforce Transit Center
- New Transbay Rail Crossing (Link21)
- 101/280 Managed Lanes Equity Study and MAP 101 coordination
- Transportation Sustainability Program (including the Transportation Sustainability Fee and the Travel Demand Management Ordinance))
- Van Ness, Geary, and Geneva/Harney Bus Rapid Transit
- Better Market Street Project
- Treasure Island Mobility Management Program
- Neighborhood Transportation Improvement Program (planning and capital improvement grants)
- School Access Study
- SFMTA Quick Build and MuniForward projects

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 K transportation sales tax, Proposition AA vehicle registration fee 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 programmed funds.

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

The Transportation Authority is also overseeing and leading the delivery of key projects, many of which support infill transit-oriented development, including serving as lead agency for the construction of the Yerba Buena Island Southgate Road Realignment and West Side Bridges Seismic Retrofit Projects.

Finally, the Transportation Authority is undertaking two additional planning and funding efforts: updating our countywide transportation plan known as the San Francisco Transportation Plan (SFTP) – a third phase of ConnectSF – and preparing to seek voter support to extend the transportation sales tax program another 30 years through development and approval of a new transportation sales tax Expenditure Plan.

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