



Memorandum

Date: November 20, 2017
To: Transportation Authority Board
From: Joe Castiglione – Deputy Director for Technology, Data & Analysis
Subject: 12/5/17 Board Meeting: Approval of the 2017 San Francisco Congestion Management Program

<p>RECOMMENDATION <input type="checkbox"/> Information <input checked="" type="checkbox"/> Action</p> <p>Approve the 2017 San Francisco Congestion Management Program (CMP)</p> <p>SUMMARY</p> <p>As the Congestion Management Agency (CMA) for San Francisco, the Transportation Authority is responsible for developing and adopting a CMP for San Francisco on a biennial basis. The CMP is the principal policy and technical document that guides the Transportation Authority’s CMA activities and demonstrates conformity with state congestion management law. The 2017 CMP incorporates several substantive updates, including 2017 system performance monitoring results; the updated CMP Capital Improvement Program; updates on initiatives to manage demand through pricing, incentives, and other strategies; Transportation Authority and City efforts to integrate land use and transportation planning in key locations; and other significant policy and planning progress since 2015.</p>	<p><input type="checkbox"/> Fund Allocation</p> <p><input type="checkbox"/> Fund Programming</p> <p><input type="checkbox"/> Policy/Legislation</p> <p><input checked="" type="checkbox"/> Plan/Study</p> <p><input type="checkbox"/> Capital Project Oversight/Delivery</p> <p><input type="checkbox"/> Budget/Finance</p> <p><input type="checkbox"/> Contract/Agreement</p> <p><input type="checkbox"/> Other:</p> <p>_____</p>
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DISCUSSION

Background.

The inaugural CMP was adopted in 1991, and the Transportation Authority Board has approved subsequent updates on a biennial basis. The CMP is the principal policy and technical document that guides the Transportation Authority’s CMA activities. Through the CMP, the Transportation Authority also monitors the City’s conformity with CMP requirements, per state congestion management law. Conformance with the CMP is a requirement for the City to receive state fuel tax subventions and for the City’s transportation projects to qualify for state and federal funding.

State congestion management statutes aim to tie transportation project funding decisions to measurable improvement in mobility and access, while considering the impacts of land use decisions on local and regional transportation systems. CMPs also help to implement, at the local level, transportation measures that improve regional air quality.

The original CMP laws were enacted in 1989; since then, multiple legislative actions have amended the CMP requirements. For instance, Senate Bill (SB) 1636 (Figueroa), passed in 2002, granted local jurisdictions the authority to designate Infill Opportunity Zones (IOZs) in areas meeting certain requirements. Within a designated IOZ, the CMA is not required to maintain traffic conditions to the adopted automobile level of service (LOS) standard. Most recently, SB 743 (Steiner) modified the criteria for local jurisdictions to designate IOZs and eliminated the previous December 2009 deadline to do so. The San Francisco IOZ, covering most of San Francisco based on transit frequency and land use criteria, was adopted by the Board of Supervisors in December 2009, but additional areas may now qualify for designation under the new legislation.

CMP Elements: The CMP has several required elements, including:

- A designated congestion management network and biennial monitoring of automobile LOS on this network;
- Assessment of multimodal system performance, including transit measures;
- A land use impact analysis methodology for estimating the transportation impacts of land use changes; and
- A multimodal Capital Improvement Program (CIP).

The CMP also contains the Transportation Authority’s technical and policy guidelines for implementing CMP requirements, including deficiency plans, travel demand forecasting, and transportation fund programming.

2017 CMP Update: The 2017 CMP is a substantive update, reflecting new data collection, activities related to important policy developments at various levels, and significant planning progress since 2015. Key updates include the following:

- **Roadway Level-Of-Service (LOS) Results:** The Transportation Authority, through its consultant team Iteris, conducted roadway LOS monitoring on the CMP

Facility Type	Spring 2015	Spring 2017
Arterial AM	14.6 mph	13.6 mph
Arterial PM	12.7 mph	12.2 mph
Freeway AM	38.8 mph	35.8 mph
Freeway PM	26.2 mph	26.4 mph

network during the spring of 2017. Combined average weekday speeds over all CMP segments in the morning and evening peak periods for 2015 and 2017 are shown in Figure 1. Average arterial travel speeds have decreased 7% from 14.6 miles per hour (mph) to 13.6 mph in the AM peak and decreased 4% from 12.7 mph to 12.2 mph in the PM peak. The average travel speed on freeways decreased 8% from 38.8 mph to 35.8 mph in the AM peak. However, in the PM peak, the average travel speed for freeways remained generally flat, with a slight improvement by 1% from 26.2 mph to 26.4 mph. While the overall declines in speeds between

2015 and 2017 indicate a continuing degradation of roadway performance, these declines were smaller in magnitude than the declines between 2013 and 2015, which are documented in the 2015 CMP report.

- **Transit Performance:** Similarly, average Muni bus speeds on the CMP network decreased between 2015 and 2017, but at a much lower rate than auto speeds. The net effect is that transit has become more competitive with driving, as indicated by drop in the ratio of auto speed to transit speed in AM peak from an average of 1.77 in 2015 to 1.67 in 2017.

The Transportation Authority performed an analysis of Muni bus speeds using data provided by the San Francisco Municipal Transportation Agency from on-vehicle Automatic Passenger Counters. Average bus speeds on the CMP network during the 2017 monitoring period were 8.13 mph in the AM peak period and 7.34 mph in the PM peak. Compared to the last monitoring cycle in 2015, speeds declined by approximately two percent in the AM peak period and one percent in the PM peak period.

Transit speed variability is measured in terms of what percent of the average transit speed is the standard deviation. An increase in this measure implies increased variability in transit speeds and hence decreased reliability. Over the current monitoring period, transit speed variability has remained consistent over the past few years and in 2017, the PM variability at 18% is slightly higher than the AM variability at 16%.

- **Transit to Automobile Travel Time 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. In the current period, transit speeds continued the trend of improving relative to auto speeds between 2015 and 2017, with the share of “transit competitive” segments, defined as those segments with a ratio less than or equal to 2.0, increased from 79% to 88%.
- **Transportation Demand Management (TDM):** The TDM Element has been updated to include the city’s efforts to implement TDM programs for new developments, through area plans, developer agreements, and planning code requirements. Updates to Transportation Sustainability Program’s (TSP) three components (Invest: Transportation Sustainability Fee, Align: CEQA Reform, and Shift: Transportation Demand Management) are also included. It reflects advancements in TDM studies and plans, including the BART Smart Travel Rewards Pilot (BART Perks) and Parking Supply and Utilization Study (PSUS). It includes updates on the city’s policies for commuter shuttles, carsharing, bikesharing.
- **Land Use Impacts Analysis Program:** This chapter has been updated to reflect the adoption of Priority Conservation Areas (PCAs) under Plan Bay Area and the One Bay Area Grant (OBAG) which promotes development within Priority Development Areas (PDAs) in the Bay Area. It includes a discussion of neighborhood- and community-level transportation planning through the Prop K-funded Neighborhood Transportation Improvement Program and the Metropolitan Transportation Commission’s (MTC’s) Community Based Transportation Planning program. Finally, the chapter provides updates to Transportation Authority’s coordination efforts with other City agencies to develop consistent measures for assessing land use impacts on transportation.

- **CIP:** The CMP must contain a seven-year CIP that identifies investments that maintain or improve transportation system performance. The CMP's CIP is amended concurrently with relevant Transportation Authority Board programming actions. Thus, the 2017 CMP reflects program updates since adoption of the 2015 CMP, most notably 2016 and 2017 Transportation Fund for Clean Air county programs, Cycle 4 of the Lifeline Transportation Program, OBAG Cycle 2, and the 2017 Prop AA Strategic Plan. Also, as required by state law, the CMP confirms San Francisco's project priorities for the Regional Transportation Improvement Program, which is adopted by MTC for submission to the state.

Over the next two years, the Transportation Authority will continue to coordinate transportation investments and support all aspects of project delivery across multiple agencies and programs, from smaller neighborhood pedestrian, bicycle and traffic calming projects to major projects including the Presidio Parkway, the Transbay Transit Center and Caltrain Downtown Extension, Caltrain Electrification, the Central Subway, and proposed bus rapid transit improvements on Van Ness Avenue and Geary Boulevard.

- **Modeling:** State law requires CMAs to develop, maintain, and utilize a computer model to analyze transportation system performance, assess land use impacts on transportation networks, and evaluate potential transportation investments and policies. The Transportation Authority's activity-based travel demand model, SF-CHAMP, has been updated since 2015, and model enhancements are discussed in the 2017 CMP, along with required documentation of consistency with MTC modeling practices.

FINANCIAL IMPACT

The recommended action would not have an impact on the adopted Fiscal Year 2017/18 budget.

CAC POSITION

The CAC will consider this item at its November 29, 2017 special meeting.

SUPPLEMENTAL MATERIALS

Attachment 1 – Draft CMP Executive Summary

Enclosure 1 – Draft 2017 San Francisco Congestion Management Program (Pending)

Enclosure 2 – CMP Technical Appendices (Pending)

EXECUTIVE SUMMARY

A. Introduction

The San Francisco Congestion Management Program (CMP) is a biennial program 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. In the years since, the Transportation Authority has designated most of the city as an Infill Opportunity Zone, enabling the use of alternatives to LOS for purposes of monitoring transportation system performance¹ (although it still reports LOS for planning purposes). The agency has evolved its CMP to include more multimodal and system performance monitoring, 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.² In November 2013, the state passed SB 743, which specifically repeals automobile delay as measured by LOS as a significant environmental impact in environmental review, and tasks the Office of Planning and Research (OPR) with preparing guidance on appropriate alternative metrics. Locally, San Francisco acted to replace LOS with Vehicle Miles Travelled (VMT) as the city's CEQA transportation impact measure, in Spring 2015.

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 facilitate sustainable 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.

The purpose of the 2017 San Francisco Congestion Management Program (CMP), prepared by the San Francisco County Transportation Authority, (the Transportation Authority) 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);

¹ See 2009 SB1636 Infill Opportunity Zone legislation and SFCTA Resolution R10-38

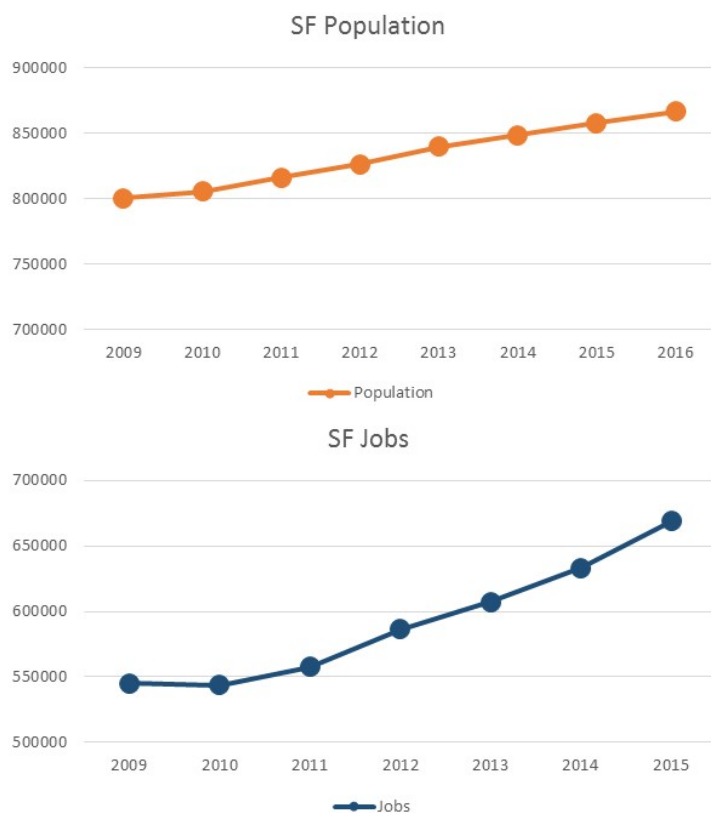
² In order to reduce vehicle delay and improve LOS, without considering strategies that encourage shifts to other modes, the increased roadway capacity is the implied solution, which, in turn, has been shown to lead to more driving (induced demand).

- Describe San Francisco’s congestion management strategies and efforts; and
- Outline the congestion management work program for fiscal years 2017/18 and 2018/19.

B. State of Transportation

San Francisco is an employment and population hub in a region that has continued to experience tremendous growth, outpacing all projections. Since 2009, San Francisco has added over 50k residents and over 100k jobs (see Figure 0-1). Between 2014 and 2016 alone, San Francisco added 20,000 residents, bringing the total population to 870,000, and the daytime population (which includes non-residents who work in the city) is well over one million. Employment growth during this same two-year period has also been torrid. According to the Bureau of Labor Statistics, total employment in San Francisco during these two years increased by almost 10%, from 640,000 to 703,000 jobs. This continues the trend of job growth exceeding population growth in the county by a factor of about three to one. Housing production, on the other hand, is lagging. This means that people are coming to San Francisco for work but live elsewhere and commute into the city. Strategies to managing congestion are key to maintaining our accessibility as the city grows. 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.

Figure 0-1: San Francisco Population and Job Growth since 2009



Source: MTC Vital Signs / American Community Survey

Roadway Level of Service

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 decreased since 2015 for most measured time periods and road types. Average arterial travel speeds have decreased 7% from 14.6 mph to 13.6 mph in the AM peak and decreased 4% from 12.7 mph to 12.2 mph in the PM peak. The average travel speed on freeways decreased 8% from 38.8 mph to 35.8 mph in the AM peak. In the PM peak, the average travel speed for freeways has remained generally flat, increasing slightly from 26.2 mph to 26.4 mph, although most of these facilities continued to operate at the lowest levels of service. While the overall declines in speeds between 2015 and 2017 indicate a continuing degradation of roadway performance, these declines were less significant than the declines between 2013 and 2015. Overall roadway performance has been declining since 2009 (see Figure 0-2).

Figure 0-2: CMP Network Average Travel Speed Change

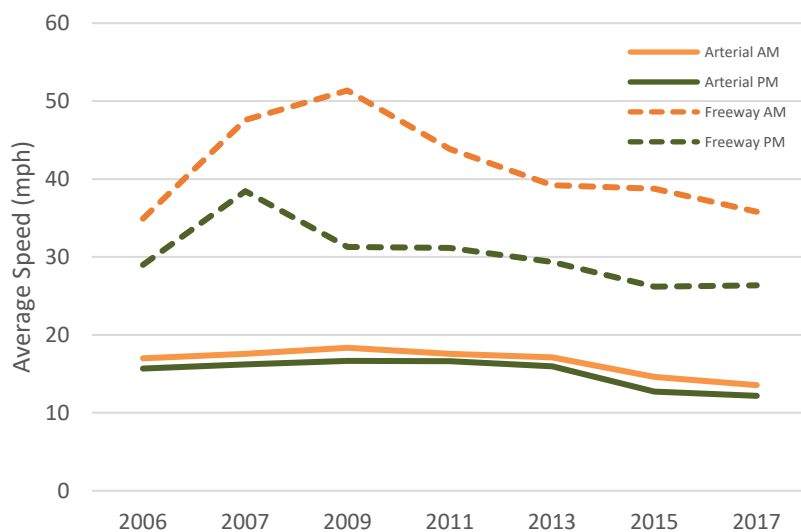
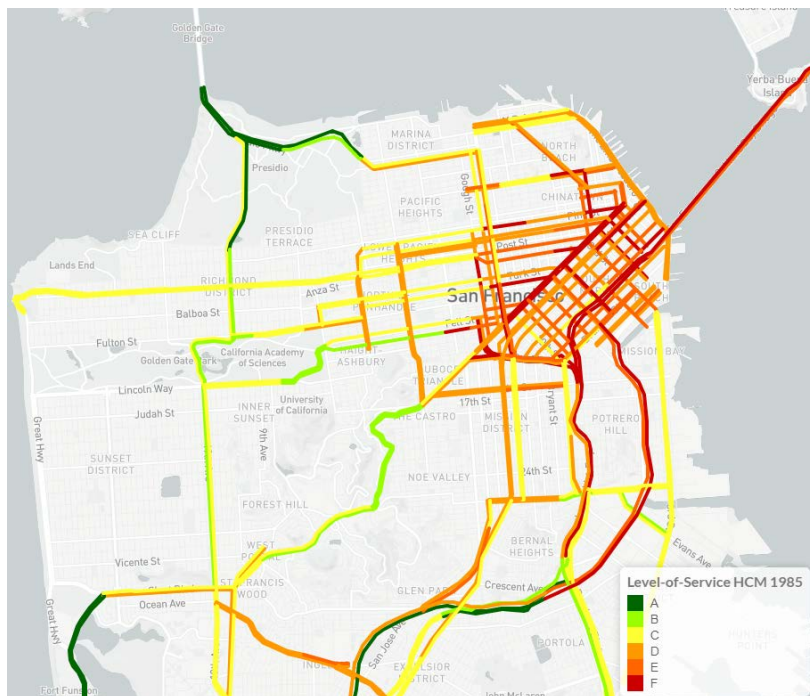


Figure 0-3 shows where the congestion is greatest in the county, primarily concentrated in the downtown and South of Market neighborhoods, and on the freeways and the arterials serving these freeways. An interactive version of this map that allows users to view historical trends can be found at cmp.sfcta.org.

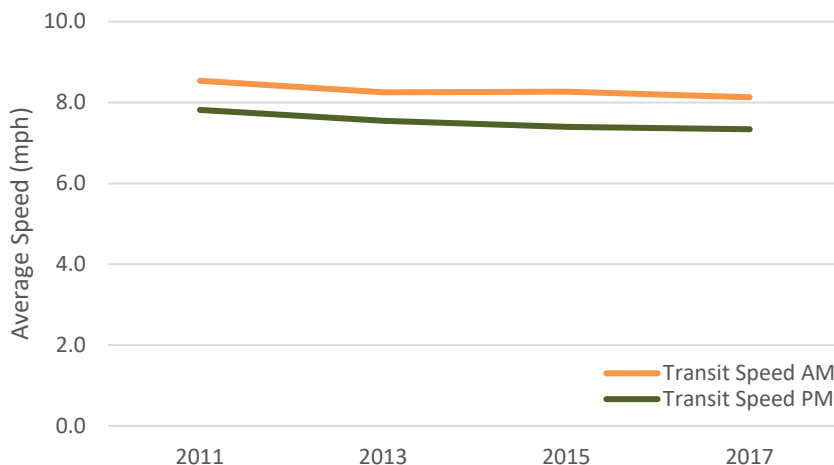
Figure 0-3: Overall Average Transit Speeds Trend for CMP Network



Transit Speeds

In addition to monitoring roadway speeds, the Transportation Authority also tracks surface transit speeds. Transit speeds on the CMP network declined slightly since 2015, although this decline was less than the decline in roadway speeds on the CMP network, and less than the decline experienced on roadways overall. Compared to 2015, the average transit speed (collected for buses only) in 2017 on the CMP network in the AM peak declined 2% from 8.26 to 8.13 mph. In the PM peak period also transit speed declined 1% from 7.40 to 7.34 mph. This relatively better performance for transit as compared with vehicles may be attributable to the city’s expanded efforts to provide on-street transit priority during this period.

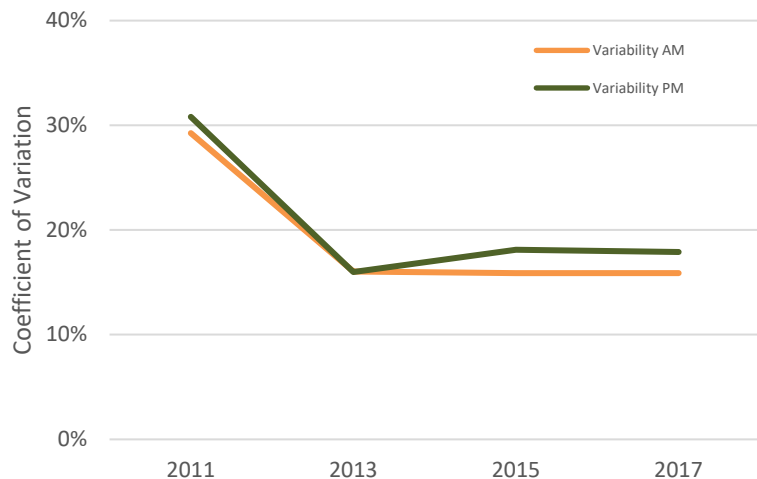
Figure 0-4: Overall Average Transit Speeds Trend for CMP Network



Transit Travel Time Reliability

Transit speed information is also used to calculate measures of transit travel time reliability. Figure 0-5 shows that transit travel time reliability is relatively good, despite increasing roadway congestion, and that this travel time reliability has remained steady between 2015 and 2017, preserving the transit reliability gains observed between 2013 and 2015. Again, this result is an indicator of the effectiveness of the city’s on-street transit priority efforts.

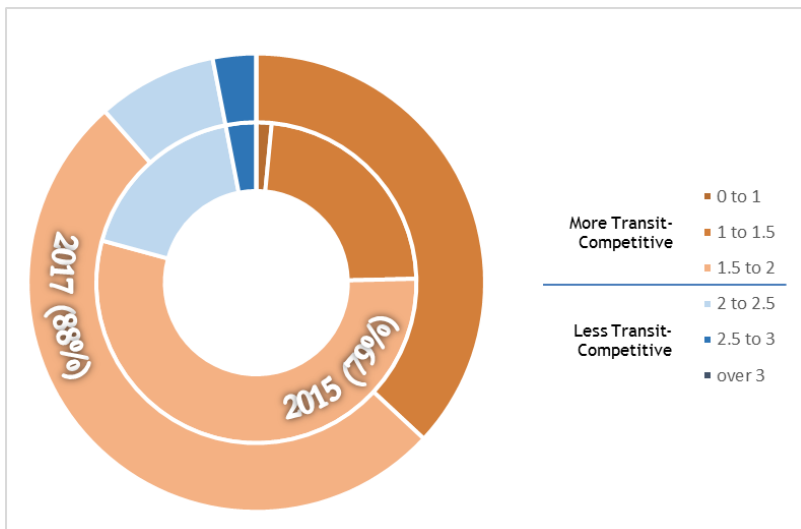
Figure 0-5: Transit Travel Time Reliability



Auto-Transit Travel Time 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. 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 0-6, transit speeds continued the trend of improving, relative to auto speeds between 2015 and 2017, with the share of “transit competitive” segments, defined as those segments with a ratio less than or equal to 2.0, increased from 79% to 88%. Overall, between 2015 and 2017 the average auto-to-transit speed ratio improved from 1.77 to 1.67 in the AM peak and 1.72 to 1.66 in the PM peak.

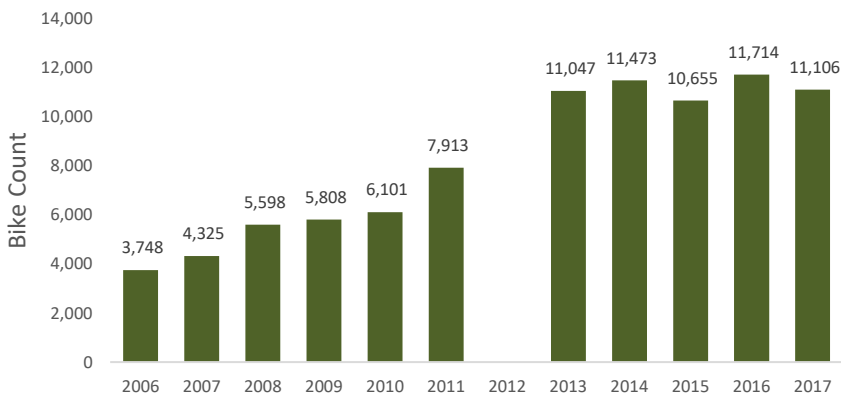
Figure 0-6: Auto-Transit Speed Ratio



Multimodal Volumes

The City and County of San Francisco has placed a high priority on shifting travelers’ modes to increase the number of trips made by walking and bicycling. Figure 0-7 shows bicycle counts collected by SFMTA from 2006 through 2017. It must be noted that, while count locations have been increasing, the figure reflects counts from a subset of the same 19 counters for all years. The most recent data suggests that bicycle ridership has remained steady over the past five years.

Figure 0-7: Bicycle Volumes

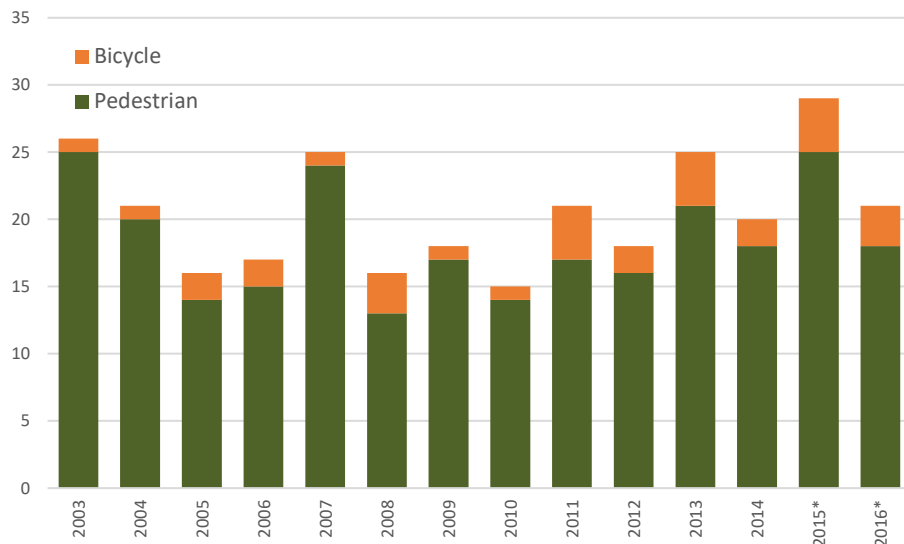


Pedestrian and Bicycle Safety

Safety for pedestrians and cyclists are key measures of non-motorized transportation performance, and a critical policy priority for the city of San Francisco. The City and County of San Francisco adopted Vision Zero as a policy in 2014, committing to build better and safer streets, educate the public on traffic safety, enforce traffic laws, and adopt policy changes that save lives. Figure 0-8 illustrates the number of

pedestrian and bicycle fatalities in San Francisco since 2013. It shows that while non-motorized fatalities were lower in 2016 than in 2015, there appears to be an overall increasing trend in the absolute number fatalities since 2010, a period of rapid city housing and job growth.

Figure 0-8: Pedestrian and Bicycle Fatalities



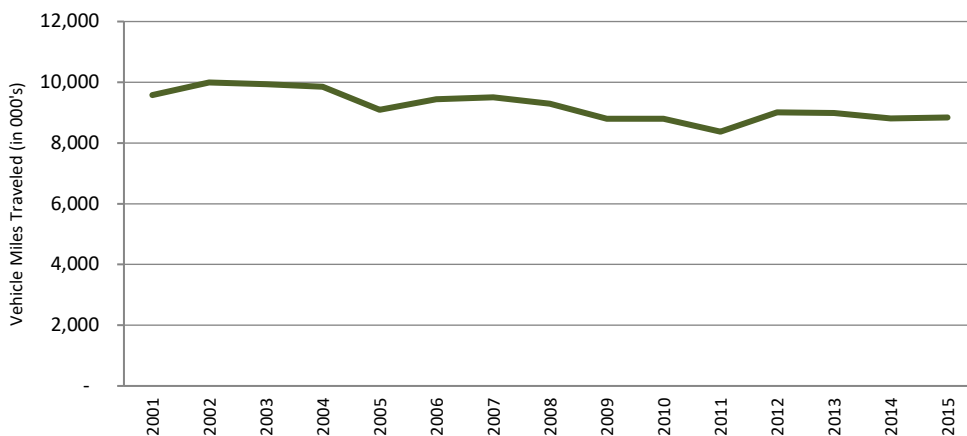
* provisional data

Other Measures

Vehicle Miles Traveled (VMT)

There is evidence that these long-term congestion management strategies are working. As shown in Figure 0-9, vehicle miles traveled (VMT), a measure of the amount of total amount of driving, has generally been holding steady, and is noticeably lower than the levels reached in 2002 and 2003. Given the rapid growth of households and jobs in the city during this timeframe, this flat VMT trend indicates that the city’s Transit First policies are working.

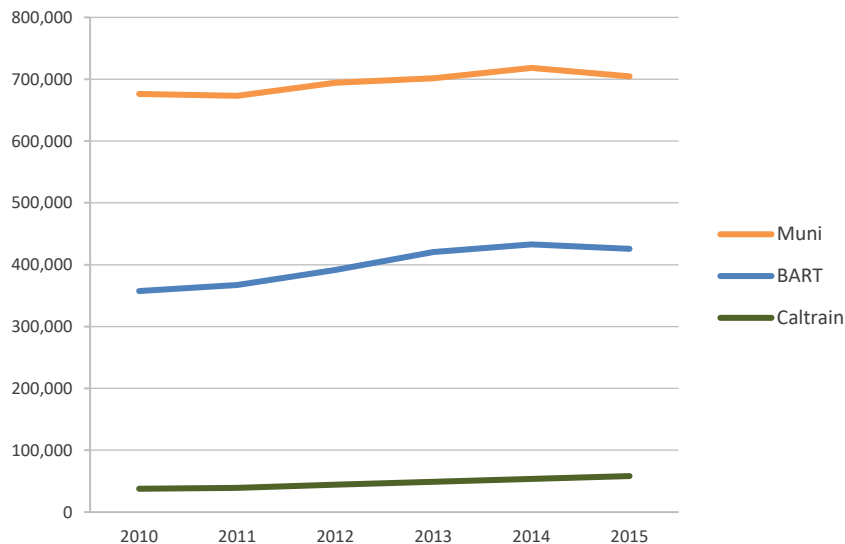
Figure 0-9: Vehicle Miles Traveled



Transit Volumes

San Francisco’s strong backbone of local and regional transit has been key to our ability to manage congestion. Muni, BART, Caltrain, and a handful of commuter bus lines, help move people into and around the city efficiently. Privately sponsored and operated services are also adding needed capacity. But as demand grows, our major transit systems are becoming crowded. Between 2010 and 2014, ridership on the three largest transit providers in San Francisco has been growing, however both Muni and BART saw decreases in ridership in 2015, as shown in Figure 0-10.

Figure 0-10: Average Daily Passengers by Transit Operator



Transportation Network Company (TNC) Volumes

Transportation network companies (TNCs) such as Uber and Lyft have become an increasingly visible presence on San Francisco streets, but until recently, there has been no comprehensive data source to help the public and decision-makers understand how many TNC trips occur in San Francisco, how much vehicle travel they generate, and their potential effects on congestion, transit ridership, and other measures of system performance. In 2017, the SFCTA released a report, TNCs Today: A Profile of San Francisco Transportation Network Company Activity, that revealed that there are a significant number of TNC trips occurring within San Francisco – over 170,000 on a typical weekday and over 220,000 on Fridays and Saturdays. In addition, the report showed that these trips primarily occur in the most congested parts of the city, at the most congested time of day. Table 0-1 indicates that it is estimated that TNCs may comprise up to 25% of peak period intra-San Francisco vehicle trips in the supervisorial districts that encompass South of Market and downtown. Recent research from UC Davis also suggests that the TNC trips draw from other sustainable modes such as transit, cycling and walking, as well as result from newly generated trips, rather than replacing driving trips.³

³ Clewlow and Mishra, “Disruptive Transportation: the Adoption, Utilization and Impacts of Ride-Hailing in the United States”, UC Davis Institute of Transportation Studies, October 2017.

Table 0-1: TNC Share of Intra-SF Vehicle Trips by Supervisor District

Supervisor District	% AM	% PM
1	8%	7%
2	20%	17%
3	19%	20%
4	4%	3%
5	14%	13%
6	25%	26%
7	5%	4%
8	10%	8%
9	10%	9%
10	7%	7%
11	3%	2%

C. What are we doing to manage congestion?

C.1 | Managing Demand for Travel

San Francisco has a robust set of travel demand management (TDM) programs, policies, and requirements designed to enable and encourage people to make trips by transit, walking, and biking and to smooth vehicle circulation. 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:
 - » Commuter Benefits Ordinance and Emergency Ride Home Program
 - » SFMTA Commuter Shuttle Policy
 - » SFMTA Carsharing Policy
 - » BART Smart Travel Rewards Pilot Project
 - » Parking Management and SF*park*
 - » SF Moves Neighborhood TDM Outreach Pilot Project
 - » Travel Demand Management Ordinance

» Bayview Moves Pilot Project

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, the region's Sustainable Communities Strategy, 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. 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
 - » Rail Storage Alternatives Analysis and I-280 Boulevard Feasibility Study
 - » Embarcadero Multimodal Design
 - » Bayshore Multimodal Facility Location Study
 - » M-Oceanview Realignment
 - » Ocean Avenue Streetscape Plan
 - » Market/Noe Streetscape Design
 - » Balboa Reservoir TDM

C.2 | Planning Projects

Connect SF, a long-range effort to define the desired and achievable transportation future for San Francisco, was launched in 2016 as a partnership between the Transportation Authority, the SFMTA, San Francisco Planning, and the Office of Economic and Workforce Development. The effort will produce a roadmap to arrive at that future, and will include a major update to the San Francisco Transportation Plan (SFTP), which was passed in 2013, with a minor update in 2017. The 2017 update includes a progress report on projects, policies, and planning studies that support and complement the 2013 SFTP's investment priorities; revises transportation funding revenue forecasts, updates project costs, and reassesses projects previously identified for funding; and identifies new planning efforts and policy papers that are underway or anticipated to begin soon. 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
- MTC Regional Core Capacity Transit Study
- Freeway Corridor Management Study (managed lanes/carpool lane feasibility)
- 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)
- Emerging Mobility, Commuter Shuttle, Late Night Transportation, and School Transportation sector studies

- San Francisco Subway Vision

C.3 | Funding and Delivering Projects

The Transportation Authority is addressing near- and long-term transportation needs for San Francisco by funding projects and programs - primarily capital infrastructure improvements, through grant programs such as Proposition K transportation sales tax, Proposition AA vehicle registration fee, and regional One Bay Area Grants (OBAG), and 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
- BART New and Renovated Vehicles
- Central Subway
- Caltrain Extension to a new Transbay Transit Center
- Caltrain Electrification

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
- Caltrain Electrification
- 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:

- Presidio Parkway (co-sponsor with Caltrans)
- Folsom Street Off-Ramp Realignment (lead)
- Yerba Buena Island I-80 Interchange Improvement Project (lead)