

CHAPTER 5**MULTIMODAL PERFORMANCE ELEMENT****Key Topics:**

- **Legislative Requirements**
- **Legislative Intent and Application to San Francisco**
- **Applications of Multimodal Performance Measures**
- **Multimodal Performance Measures: Progress**
- **Work Program - Key Milestones**

1. Legislative Requirements

AB 1963 in 1994 modified Section 65089(b)(2) to replace the transit service standards requirements previously mandated for the 1991 and 1993 CMPs. The revised statutes state 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. At a minimum, these performance measures shall incorporate highway and roadway system performance, and measures established for the frequency and routing of public transit, and for the coordination of transit service provided by separate operators. These performance measures shall support mobility, air quality, land use, and economic objectives, and shall be used in the development of the capital improvement program..., deficiency plans..., and the land use analysis program...."

2. Legislative Intent and Application to San Francisco

The original legislation defined performance narrowly as Level of Service (LOS) on roadways.

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

According to the State legislation [Government Code § 65089.3 (b)(1)(A)], deficiencies are detected only on the roadway system. San Francisco, however, should have performance standards and measurements for the transit network, bicycle network, and pedestrian facilities. San Francisco's high transit mode share and extensive transit network mean that the City will benefit from a multimodal approach to system performance. This is especially true since Deficiency Plans depend on the transit, bicycle and pedestrian systems to offset LOS deficiencies on the roads and intersections.

3. Applications of Multimodal Performance Measures

State law requires that link (roadway) LOS be used for determining CMP conformance and deficiency planning, with certain exceptions. Multimodal performance measures will be used for the following purposes:

a. CMP Conformance Determinations: Link (roadway) Level of Service (LOS) will continue to be used for conformance determinations for areas that are not designated by the City as Infill Opportunity Zones.

Senate Bill 1636, signed by the Governor in September 2002, allows cities to designate Infill Opportunity Zones which are exempt from CMP Level of Service Requirements. Infill Opportunity Zones, if designated by the City, would complement efforts to redefine the level of service monitoring concept to better address the needs of transit and bicycle users and pedestrians. Multimodal performance measures would be used in place of conventional LOS measures within these zones. See Chapter 6 for further discussion of potential City adoption of Infill Opportunity Zones.

b. CIP Amendments: The Authority will continue to evaluate the potential impacts of proposed CIP changes on the performance of the multimodal network. This information is used as one of the factors in deciding Authority concurrence with such proposals. See Chapter 8 for further details.

c. Deficiency Plans: Only link LOS measurements will be used for deficiency determinations.

d. Land Use Impacts Analysis: Multimodal performance measures will be used for the analysis of impacts of local land use decisions on the CMP network.

Another relevant legislative change with implications for multimodal performance measurement is SB 1492, signed by the Governor in September 2002. This bill requires MTC to establish performance goals and measures, to evaluate transportation projects and programs proposed for Track 1 (highest priority) in the 2005 RTP. The Authority has been advocating for project and corridor-specific performance measures for many years. The Authority should also consider whether any of these performance measures are appropriate for the CMP for transit, or for land use impacts analysis of projects.

4. Multimodal Performance Measures: Progress

Consistent with state law, the 2007 San Francisco CMP distinguishes between two tiers of performance measures. Tier 1 includes roadway LOS plus three transit service performance measures: routing, frequency, and inter-operator service coordination. These are the most traditional measures with a documented record of monitoring, analysis, and planning. Roadway LOS is used in connection with CMP conformance determinations.

Tier 2 includes multimodal performance measures that are not yet applied to the CMP conformance process. Standards must eventually be developed for these performance measures. With this CMP, the Authority introduces new quantitative meas-

ures of transit performance—transit speeds and transit speeds relative to auto speed—based on automatic vehicle locator (AVL) data. The Authority also completed a Model update, which dynamically links estimated transit speeds to roadway speeds, documenting the effect that mixed traffic congestion has on transit speed. The Authority also continues its ongoing technical and policy vehicles for development of a final set of Tier 2 performance measures, including: implementation of the policies and strategies in the Countywide Plan and the development of multimodal LOS methodologies based on the Authority's Level of Service Strategic Analysis Report (SAR) and Technical Working Group.

4.1. Tier 1 Performance Measures

a. Roadway Level of Service (LOS): This is the most traditional and best documented performance measure, but it is not desirable or adequate to assess performance in a system which includes a major transit component, as well as substantial pedestrian and bicycle travel. And of course, every trip begins or ends with a pedestrian component, even if that means walking down the street to a parked car. Roadway LOS is described in detail in Chapter 4: LOS Monitoring.

b. Transit Coverage/Routing: This refers to the pattern of the transit route network (e.g., radial, grid, etc.) and the service area covered (e.g., percent of total population served within one-quarter mile; or percent of total urbanized area served).

c. Transit Frequency: This is the number of transit vehicles (buses, trains, or ferries) per hour (e.g., 4 buses per hour). The inverse of the frequency is called "headway", which is the time between transit vehicles (e.g., 15 minutes between buses).

Table 5-A, found at the end of this chapter, shows frequency (headway) and coverage standards for all transit operators that provide service in San Francisco.

A number of transit operators provide connections to and from points outside the City. Because of the predominantly suburban, low-density environment in which they function, which limits the amount and kinds of service they can provide, these operators have established significantly different standards from those that Muni is expected to achieve in San Francisco. These differences are reflected in Table 5-A. The transit standards are essentially established policy and in most cases are taken directly from each operator's current Short Range Transit Plan.

d. Interoperator Coordination: This addresses the linkages between transit services provided by different operators (e.g., timed transfers at transit centers, joint fare cards, etc.), to facilitate the use of transit.

Initially, 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. More recently, SB 1474 set coordination objectives for the region's transit services, and MTC has adopted Resolution 3055, Transit Coordination Implementation Plan, to comply with SB1474. 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.

The Authority is currently engaged with partner agencies in efforts to substantially improve system connectivity and ease interoperator transfers. In the future, travelers in San Francisco—and across the greater Bay Area—will use an integrated mobility account for accessing and paying for transportation. The unified system will provide interoperator functionality (i.e., Translink, a single fare card for use with different transit providers). The integrated mobility account will also include non-transit systems, FasTrak (automated bridge-tolling), parking payment, and, if implemented, congestion pricing. Such a system would provide ready access to account information, especially

through web and mobile interfaces. With a centralized mobility management system, users could also be encouraged to make better transportation decisions and evaluate travel costs and tradeoffs in a more comprehensive manner.

4.2. Tier 2 Performance Measures: Approach

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 particular groups of users—transit riders, bicyclists, and pedestrians.

Traffic congestion has been measured with a widely recognized, standard approach—LOS—for decades. By contrast, information about the performance of the rest of the transportation network, for those who choose to walk, bike, or take transit, is less standardized and the information that is available tends to be of limited value to the user. For example, transit system data is collected mostly in response to federal or state requirements tied to eligibility for funding. Typical data collected includes total daily ridership, an indicator of current demand for service, and cost per passenger mile, an indicator of cost effectiveness. However, while these are useful management tools, they say little about the quality of service, either in terms of system performance, or service as experienced by the user. Similarly, data pertaining to bicycle and pedestrian trips is seldom available. When collected, it is usually in connection with a specific project proposal, and is not a part of a systematic effort that provides a picture of the user's experience.

Multimodal performance data is increasingly needed not just for system performance measurement pursuant to the countywide plan and congestion management planning, but also for 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.

By applying the performance measures for travel by car, transit, bicycle, or foot to different neighborhoods in the City, we can produce a *city-wide picture of comparative mobility* between neighborhoods, modes (e.g. transit vs. auto), or types of users (e.g. transit dependent, elderly). We can also evaluate the accessibility of different parts of the city, by analyzing the number of destinations that are reachable by different modes of transportation.

The Authority's GIS Database is the main tool for analysis of system performance and it will be the main repository for performance-related data.

4.3. Transit Speeds

Muni has recently installed automatic vehicle locator (AVL) technology on its fleet of diesel buses, electric trolley-buses, and light-rail vehicles. A GPS-based real-time monitoring system, AVL is useful both from an operational perspective (i.e., NextBus) and planning perspective. The Authority is in the initial stages of using this extensive data source. AVL data provide highly accurate operational information regarding the operational characteristics of the transit network. The Authority can now monitor average transit speeds in addition to average auto speeds. Changes in transit performance over time can now be readily tracked.

These efforts are complemented by recent improvements to the Authority's travel demand model. The model now links roadway and transit performance. The AVL data helps us validate this Model improvement that makes transit speeds dynamic rather than fixed. This means that as auto speeds change in the model, transit speeds change in response. This allows us to monitor the effects of congestion and changes in auto trip volumes on transit speeds. Improvements to the Model are detailed in Chapter 10.

The 2007 CMP includes, for the first time, reporting of transit speeds on key monitored segments of the Muni system. Currently, AVL data is only available for light-rail and trolley bus lines, but fleetwide data will be available by the end of 2007.

Tables 5.1 and 5.2 below, present auto and transit speeds on the CMP segments for which transit data is available. These tables include transit to automobile travel time ratios, illustrating the significant gap between transit and auto speeds that presently exists on many segments.

The transit priority network (TPN), Figure 5-1 below, consists of all light-rail lines, planned bus rapid transit service, and a collection of other routes, which represent a rapid transit network as guided by the Countywide Transportation Plan. Transit priority treatments and deployment of faster transit services focus on the TPN.

Table 5.3 and Figures 5.2 and 5.3, below, present transit speeds (route-level) on currently monitored portions of the transit priority network. In future CMP updates, the Authority will establish a specific network and methodology for transit performance measurement.

Formatted: Not Highlight

4.4. Transportation System Level of Service Methodologies SAR

In December 2003, the Authority Board adopted the Transportation Level of Service (LOS) Methodologies Strategic Analysis Report (SAR) examining alternative measures for the transportation impacts of projects pursuant to CEQA. The SAR concluded that current transportation impact measures and review process should be redefined to better support San Francisco's existing multimodal transportation and environmental policies. Specifically, The LOS SAR concluded that the existing transportation impact analysis process under CEQA is:

- Unpredictable and not transparent for project sponsors;
- Inefficient for the Planning Department; and
- Inconsistent with the City's Transit First policy, which prioritizes transit, walking, and bicycling to accommodate trip-making in San Francisco.

The LOS SAR recommended that improvements to the transportation impact analysis process include revisions to the measure of transportation

impacts, as well as to the process for reviewing transportation impacts under CEQA.

The SAR also recommended that the Authority convene a technical working group (TWG), including representation from the Planning Department's Office of Major Environmental Assessment, Muni and Department of Parking and Traffic (DPT), user groups, and industry practitioners. The LOS TWG has refined the SAR recommendations for the Authority Board's approval and subsequent action.

Based on the LOS TWG discussions, two actions that reform the analysis of transportation impacts under CEQA were recommended to the Authority Board in July 2005: using a measure of automobile trips generated as the definition of a significant transportation impact, instead of roadway LOS; and adopting by ordinance a transportation impact mitigation fee program.

These new measures in the CEQA context would have some benefits for the CMP program as well. A revised auto trip generation measure would allow the Authority and the City to better understand the impacts of local land use decisions on the CMP network. The impact mitigation fee program could also be used to mitigate deficiencies on the CMP network, similar to the Congestion Management Fee approach being studied by the Los Angeles County MTA. LA MTA is currently in the process of developing a nexus study for a "congestion management fee" program. This countywide fee program would allow for ongoing mitigation of deficiencies by having developers contribute to a fund that would fund a countywide program of transportation projects that would mitigate the effects of growth on Los Angeles County's CMP.

a. Auto Trips Generated Measure: The current measure and standard of significant impacts to transportation, roadway LOS, is a measure of delay to automobiles. This measure should be replaced by a measure and standard based on the number of automobile trips generated by a project.

The Transit First policy in the City Charter recognizes that some short-term auto congestion is a predictable and unavoidable consequence of im-

plementing Transit First policies, since mode shift will occur gradually as the transit, bicycle and pedestrian networks are improved. As the SAR noted, the current measure of transportation impact—a measure of automobile delay—is inconsistent with the Transit First policy for this reason. A measure of auto trips generated, in contrast, recognizes that adding additional automobile trips to San Francisco streets is environmentally undesirable, but distinguishes those from automobile congestion impacts that may result from improving the city's networks for transit, walking, and cycling.

Automobile trip generation methodologies are well developed and would not require extensive further development, although more work is needed to establish a clear methodology for this particular application. The Planning Department's Guidelines for Environmental Review already include a methodology for auto trip generation that could be refined and improved for use as the CEQA impact standard. An appropriate threshold to define a significant increase in automobile trips would need to be defined. For example, the LOS TWG may define the significance threshold on an absolute (specific number of trips) or relative (% increase in trips) basis, taking a street's current level of vehicle demand and capacity into account.

The LOS TWG has identified possible supplemental impact methodologies, such as a measure of transit crowding, which may be important to retain in transportation impact analysis alongside the auto trip generation measure. In addition, system-level (e.g., person-delay) and more robust modal LOS measures are recommended for general transportation planning and analysis purposes that typically take place at the earlier conceptual planning and design phase of a project (prior to the environmental clearance stage), in addition to use in monitoring the performance of transit and bicycle networks for CMP purposes.

b. Transportation Impact Mitigation Fee:

A transportation impact mitigation fee (TIMF) is a development fee levied on new development in proportion to the expected impacts of that development on the transportation system. San Francisco currently has a transit impact development

fee, which mitigates, in part, the impacts of new development on Muni transit service. The LOS TWG recommends extending or complementing the TIDF to cover all modes of transportation. The new fee revenues would fund a designated countywide program of transportation projects for all modes, designed to mitigate the cumulative impacts of countywide growth at the system level.

The TIMF program was recommended as one that would chiefly benefit CEQA transportation impact analysis process, but it would benefit the CMP program as well. It would allow for developers whose project impact the performance of the CMP network to contribute funds to a program that would fund a countywide set of multimodal projects intended to mitigate or offset the impacts of growth on the CMP system.

c. Roadmap: Once a specific methodology has been defined, the LOS TWG recommends that auto trips generated replace auto LOS as the CEQA transportation impact measure.

The new measure and standard would need to be adopted by resolution of the Planning Commission after a public review process. This action needs to be supported by evidence in the legal record - technical reports and analyses that explain the reasons for the new measure. Authority staff, working closely with the Planning Department and the LOS TWG, are close to completing the technical analysis and recommending an Auto Trip Generation measure and significance threshold. The recommendation will include a description of how the new measure will be calculated and applied and identify the threshold of significance for CEQA impact evaluation purposes.

Regarding the TIMF recommendation, the Board of Supervisors may adopt a fee program by ordinance. First, a nexus study must be prepared to determine the reasonable relationship between the projects that must pay the fee, the fee structure and level, and the mitigation projects that would be funded by fee revenues. Any new measure and standard for transportation impact—e.g., auto trips generated—must be ready to incorporate into the nexus study's evaluation. A countywide program of projects that the fee

revenue will be expended upon must also be identified, and the institutional mechanism to administer the revenues must be determined.

Over the next CMP cycle, the Authority will continue development of new transportation impact measures and guidelines, focusing on the above two recommendations. In particular, the scope of work for next steps would potentially include support to the city in implementing the auto trip generation measure, and potentially by supporting the development of local trip generation rates and refined superdistricts, among other activities; and initiating a nexus study to support a TIMF program.

In future cycles, the Authority may work with the TWG to develop supplemental multimodal impact measures for transit and bicycles, which could also be used in the CMP context to evaluate the performance of San Francisco's transit and bicycle networks. Thus, the SAR recommendations advance the next steps in developing "Tier 2" performance measures for all modes in the CMP.

4.5. Tier 2 Performance Measures Derived from Existing Data

In November 1999, San Francisco voters passed Proposition E which, among other things, amended the city charter to require the creation of service standards and milestones for Muni to attain. The MTA's Board of Directors updates these periodically. Table 5-B lists the service standards and milestones that directly pertain to the improvement of mobility.

5. Work Program Items - Key Milestones

- Continue to develop Tier 2 performance measures as alternatives to conventional LOS measures, as well as applications to LOS monitoring methods and evaluation of transportation and Infill projects.
- Monitor and analyze AVL data for Muni's entire fleet.
- Complete technical analysis of Auto Trip Generation measure and provide recommendations to the Planning Commission.

- Continue LOS TWG Phase 2 work. Key components of Phase 2 include revision of Auto Trip Generation Rates and a nexus study for the TIMF.
- Coordinate with city departments to improve the availability and collection of data about level of service and performance of all modes, particularly “before and after” studies related to pedestrian, transit and bicycle travel.
- Continuously improve the San Francisco Model’s capability to model all modes of transportation, including bicycle and pedestrian trips.

Table 5-1
2006 & 2007 Transit to Auto Speed Comparison AM Peak Period

AM Transit and Auto Speeds (CMP segments with currently available transit data)

Name	From	To	Travel Dir.	Dist. (mi)	2006 Auto Speed (mph)	2006 Muni Speed (mph)	2006 Auto/Transit Ratio	2007 Auto Speed (mph)	2007 Muni Speed (mph)	2007 Auto/Transit Ratio	Muni Segment (if different from auto)
Castro/Divisadero	Market	14th Street	N	0.34	16.0	10.7	1.5	9.0	9.3	0.97	
Castro/Divisadero	Geary	Pine	N	0.27	7.1	6.0	1.2	6.1	6.0	1.01	
Sutter	Mason	Gough	W	0.87	12.8	7.1	1.8	8.6	6.8	1.26	
Fulton	Arguello	Masonic	E	0.66	15.0	10.2	1.5	12.5	9.6	1.30	
Market/Portola	Guerrero	Van Ness	E	0.42	6.7	5.8	1.2	8.9	6.2	1.44	
Ocean	19th Avenue	Miramar	E	1.10	14.3	12.2	1.2	13.6	9.4	1.45	Junipero Serra to Miramar
Market/Portola	Castro	Guerrero	E	0.79	13.2	7.5	1.8	10.1	6.9	1.47	
Ocean	Howth	Miramar	W	0.47	13.4	9.0	1.5	11.3	7.4	1.52	
Mission/Otis	9th Street	3rd Street	N	0.98	18.4	9.1	2.0	13.0	8.5	1.53	
Van Ness/S Van Ness	Washington	Lombard	N	0.58	9.2	6.6	1.4	10.2	6.6	1.54	
Castro/Divisadero	14th Street	Market	S	0.34	10.3	10.1	1.0	16.4	10.4	1.58	
Sutter	Divisadero	Gough	E	0.82	15.7	11.0	1.4	14.6	9.1	1.61	Divisadero to Laguna
Ocean	Miramar	Howth	E	0.47	12.6	10.0	1.3	13.4	8.2	1.64	
Castro/Divisadero	14th Street	Geary	N	1.16	11.2	6.9	1.6	11.3	6.8	1.65	
Market/Portola	Van Ness	Guerrero	W	0.42	13.6	8.2	1.7	13.9	8.3	1.67	
Ocean	Miramar	19th Avenue	W	1.10	13.8	9.6	1.4	13.4	8.0	1.68	Miramar to Junipero Serra
16th Street	Potrero	Mission	W	0.66	13.4	7.7	1.7	11.5	6.8	1.68	
Sutter	Gough	Divisadero	W	0.82	15.1	10.2	1.5	15.3	9.0	1.70	
Mission/Otis	14th Street	C. Chavez	S	1.37	16.0	8.7	1.8	13.5	7.8	1.73	
Mission/Otis	C. Chavez	Ocean	S	1.94	18.9	10.6	1.8	16.7	9.6	1.75	
Market/Portola	Van Ness	Drumm	E	1.76	9.3	7.0	1.3	12.0	6.8	1.78	
Columbus	North Point	Greenwich	S	0.43	15.9	8.5	1.9	12.5	7.0	1.79	
4th St/Stockton	Market	Harrison	S	0.47	11.3	6.2	1.8	9.4	5.1	1.84	
Mission/Otis	Ocean	C. Chavez	N	1.94	18.1	9.1	2.0	14.8	8.0	1.84	
Turk	Divisadero	Stanyan	W	0.91	17.1	11.4	1.5	20.0	10.9	1.84	
Mission/Otis	14th Street	9th Street	N	0.65	11.0	6.7	1.7	11.5	6.2	1.85	
Van Ness/S Van Ness	Golden Gate	13th Street	S	0.80	12.7	6.5	2.0	11.8	6.4	1.85	Golden Gate to Mission
Potrero	Division	21st Street	S	0.80	21.5	9.4	2.3	20.5	11.1	1.86	16th Street to 21st Street
West Portal	Ulloa	Sloat	S	0.55	16.1	10.6	1.5	15.1	8.1	1.86	
Market/Portola	Drumm	Van Ness	W	1.76	12.8	7.4	1.7	13.6	7.3	1.87	
16th Street	Mission	Market	W	0.74	12.9	7.0	1.8	13.7	7.2	1.91	Mission to Church
Mission/Otis	C. Chavez	14th Street	N	1.37	13.6	8.1	1.7	14.6	7.7	1.91	
Fulton	Arguello	Park Pres.	W	0.73	18.0	10.8	1.7	20.1	10.2	1.97	
Mission/Otis	3rd Street	Embarcadero	N	0.73	11.8	5.5	2.2	10.2	5.2	1.98	3rd Street to Main
Van Ness/S Van Ness	Golden Gate	Washington	N	0.83	11.5	5.7	2.0	11.9	5.9	2.01	
Mission/Otis	3rd Street	9th Street	S	0.98	16.3	9.1	1.8	16.6	8.2	2.03	
Castro/Divisadero	Pine	Geary	S	0.27	11.7	7.4	1.6	15.6	7.5	2.09	
16th Street	Mission	Potrero	E	0.66	15.9	7.0	2.3	13.6	6.5	2.10	
Mission/Otis	Embarcadero	3rd Street	S	0.73	13.2	6.9	1.9	13.1	6.2	2.12	Main to 3rd Street
Fulton	Masonic	Arguello	W	0.66	18.5	11.6	1.6	23.5	10.9	2.15	
West Portal	Sloat	Ulloa	N	0.55	18.7	7.9	2.4	15.3	7.1	2.16	
Castro/Divisadero	Geary	14th Street	S	1.16	12.3	7.0	1.8	15.8	7.3	2.17	
Mission/Otis	9th Street	14th Street	S	0.67	14.1	7.9	1.8	15.2	7.0	2.17	
5th St/Stockton	Harrison	King	S	0.43	16.0	7.4	2.2	16.0	7.3	2.21	Harrison to Townsend
North Point	Columbus	Van Ness	W	0.38	17.6	9.7	1.8	17.0	7.7	2.21	
North Point	Van Ness	Columbus	E	0.38	18.9	8.7	2.2	13.1	5.9	2.22	
Turk	Stanyan	Divisadero	E	0.91	17.7	10.2	1.7	20.8	9.3	2.24	
Van Ness/S Van Ness	Lombard	Washington	S	0.58	12.7	7.0	1.8	17.8	7.7	2.32	
Columbus	Greenwich	North Point	N	0.43	18.8	8.9	2.1	16.6	7.1	2.33	
Van Ness/S Van Ness	13th Street	Golden Gate	N	0.79	11.8	6.1	1.9	14.6	6.1	2.40	Mission to Golden Gate
Potrero	21st Street	Division	N	0.80	17.7	11.7	1.5	26.5	10.9	2.43	21st Street to 16th Street
Mission/Otis	Ocean	Sickles	S	1.45	20.7	12.3	1.7	25.3	10.2	2.48	
Sutter	Market	Mason	W	0.56	11.2	7.3	1.5	16.9	6.7	2.51	
Market/Portola	Guerrero	Castro	W	0.79	16.9	6.3	2.7	15.7	6.2	2.52	
Van Ness/S Van Ness	Washington	Golden Gate	S	0.83	16.1	6.0	2.7	17.2	6.4	2.70	
Mission/Otis	Sickles	Ocean	N	1.45	26.3	9.3	2.8	21.8	8.1	2.71	
Hayes	Market	Gough	W	0.38	16.6	7.2	2.3	18.0	6.5	2.79	
Potrero	21st Street	C. Chavez	S	0.61	19.1	8.8	2.2	25.5	8.9	2.87	21st Street to 24th Street
16th Street	Market	Mission	E	0.74	19.0	5.8	3.3	18.5	6.1	3.04	Church to Mission
Fulton	Park Pres.	Arguello	E	0.73	22.3	9.0	2.5	29.8	8.0	3.73	
Main	Mission	Market	N	0.13	13.9	4.5	3.1	16.8	4.4	3.78	
Potrero	C. Chavez	21st Street	N	0.61	17.8	7.1	2.5	26.6	6.4	4.18	24th Street to 21st Street

Table 5-2
2006 & 2007 Transit to Auto Speed Comparison, PM Peak Period

PM Transit and Auto Speeds (CMP segments with currently available transit data)

Name	From	To	Travel Dir.	Dist. (mi)	2006 Auto Speed (mph)	2006 Muni Speed (mph)	2006 Auto/Transit Ratio	2007 Auto Speed (mph)	2007 Muni Speed (mph)	2007 Auto/Transit Ratio	Muni Segment (if different from auto)
Castro/Divisadero	Market	14th Street	N	0.34	15.2	9.6	1.6	10.0	9.2	1.09	
Fulton	Arguello	Masonic	E	0.66	15.0	9.6	1.6	10.9	8.2	1.33	
Castro/Divisadero	14th	Market	S	0.34	12.0	9.1	1.3	11.6	8.4	1.38	
Market/Portola	Van Ness	Drumm	E	1.76	11.0	6.6	1.7	9.2	6.2	1.48	
Market/Portola	Van Ness	Guerrero	W	0.42	12.1	6.5	1.9	8.3	5.4	1.55	
Castro/Divisadero	Pine	Geary	S	0.27	11.7	5.6	2.1	8.6	5.5	1.56	
Ocean	Howth	Miramar	W	0.47	9.5	8.3	1.1	10.7	6.6	1.63	
16th Street	Mission	Potrero	E	0.66	13.1	6.5	2.0	9.8	6.0	1.63	
Market/Portola	Castro	Guerrero	E	0.8	10.0	7.0	1.4	10.6	6.4	1.65	
Castro/Divisadero	Geary	Pine	N	0.27	7.5	5.5	1.4	10.3	6.1	1.68	
Van Ness/S Van Ness	Washington	Golden Gate	S	0.83	8.0	4.7	1.7	10.4	6.1	1.69	
Mission/Otis	3rd Street	Embarcadero	N	0.73	7.6	5.6	1.3	8.9	5.2	1.72	3rd Street to Main
Castro/Divisadero	Geary	14th	S	1.16	12.3	5.5	2.2	9.4	5.4	1.74	
5th St/Stockton	Harrison	King	S	0.43	15.0	8.0	1.9	14.1	7.9	1.79	Harrison to Townsend
Mission/Otis	3rd Street	9th Street	S	0.98	18.3	8.4	2.2	13.2	7.2	1.85	
Mission/Otis	9th Street	3rd Street	N	0.98	12.7	8.5	1.5	14.2	7.6	1.86	
Turk	Stanyan	Divisadero	E	0.91	18.4	10.5	1.8	19.1	10.0	1.91	
Columbus	North Point	Greenwich	S	0.43	15.9	7.3	2.2	12.5	6.6	1.91	
Market/Portola	Guerrero	Van Ness	E	0.42	7.0	5.5	1.3	10.5	5.4	1.94	
Mission/Otis	C. Chavez	Ocean	S	1.94	14.7	8.2	1.8	14.5	7.5	1.94	
Mission/Otis	Ocean	C. Chavez	N	1.94	19.1	8.8	2.2	15.3	7.8	1.95	
Mission/Otis	Ocean	Sickles	S	1.45	21.3	9.7	2.2	16.6	8.5	1.95	
Sutter	Mason	Gough	W	0.87	13.3	6.5	2.1	12.4	6.3	1.97	
16th Street	Market	Mission	E	0.74	11.0	5.5	2.0	10.5	5.3	1.99	Church to Mission
Potrero	Division	21st Street	S	0.80	16.5	9.4	1.8	20.5	10.3	1.99	16th Street to 21st Street
Market/Portola	Drumm	Van Ness	W	1.76	9.9	6.2	1.6	11.5	5.7	2.00	
Sutter	Divisadero	Gough	E	0.82	15.8	11.4	1.4	15.9	7.7	2.06	Divisadero to Laguna
Sutter	Gough	Divisadero	W	0.82	13.3	9.1	1.5	15.6	7.6	2.07	
Ocean	Miramar	Howth	E	0.47	14.2	9.0	1.6	13.7	6.6	2.07	
Mission/Otis	Embarcadero	3rd Street	S	0.73	13.4	7.0	1.9	11.3	5.4	2.08	Main to 3rd Street
Potrero	21st Street	Division	N	0.80	14.9	9.7	1.5	21.3	10.2	2.09	21st Street to 16th Street
Ocean	19th Avenue	Miramar	E	1.10	12.4	9.5	1.3	14.9	7.1	2.11	Junipero Serra to Miramar
Mission/Otis	14th Street	9th Street	N	0.65	12.3	6.6	1.9	12.6	5.9	2.12	
Castro/Divisadero	14th	Geary	N	1.16	9.4	6.7	1.4	13.8	6.5	2.14	
Ocean	Miramar	19th Avenue	W	1.10	12.5	9.5	1.3	15.4	7.2	2.15	Miramar to Junipero Serra
4th St/Stockton	Market	Harrison	S	0.47	8.9	5.1	1.7	9.1	4.2	2.17	
North Point	Columbus	Van Ness	W	0.38	19.5	7.4	2.6	12.6	5.8	2.19	
Mission/Otis	C. Chavez	14th Street	N	1.37	12.6	7.0	1.8	13.8	6.3	2.19	
Turk	Divisadero	Stanyan	W	0.91	21.3	10.2	2.1	18.9	8.6	2.20	
16th Street	Mission	Market	W	0.74	10.6	5.9	1.8	14.1	6.4	2.22	Mission to Church
Potrero	21st Street	C. Chavez	S	0.61	15.5	7.4	2.1	15.8	7.1	2.23	21st Street to 24th Street
Van Ness/S Van Ness	Golden Gate	13th	S	0.80	9.1	4.1	2.2	12.7	5.7	2.25	Golden Gate to Mission
Mission/Otis	14th Street	C. Chavez	S	1.37	13.3	6.5	2.1	13.4	5.7	2.34	
Mission/Otis	Sickles	Ocean	N	1.45	23.0	9.4	2.5	19.8	8.2	2.41	
Sutter	Market	Mason	W	0.56	11.6	5.7	2.0	13.5	5.5	2.46	
West Portal	Sloat	Ulloa	N	0.55	15.1	6.6	2.3	15.1	6.1	2.48	
Mission/Otis	9th Street	14th Street	S	0.67	12.9	6.7	1.9	13.4	5.4	2.48	
16th Street	Potrero	Mission	W	0.66	11.2	5.9	1.9	13.6	5.4	2.50	
Columbus	Greenwich	North Point	N	0.43	13.3	8.1	1.6	16.8	6.7	2.50	
Van Ness/S Van Ness	13th	Golden Gate	N	0.79	10.2	5.0	2.0	12.8	5.1	2.50	Mission to Golden Gate
West Portal	Ulloa	Sloat	S	0.55	17.1	8.9	1.9	15.4	6.1	2.52	
Fulton	Masonic	Arguello	W	0.66	20.7	10.3	2.0	23.9	9.3	2.57	
Market/Portola	Guerrero	Castro	W	0.8	19.4	6.3	3.1	15.0	5.8	2.59	
Hayes	Market	Gough	W	0.38	11.8	6.1	2.0	13.3	5.1	2.61	
Fulton	Arguello	Park Pres.	W	0.73	23.6	8.7	2.7	21.0	7.6	2.78	
Van Ness/S Van Ness	Lombard	Washington	S	0.58	13.5	6.4	2.1	19.9	7.1	2.79	
North Point	Van Ness	Columbus	E	0.38	11.4	6.8	1.7	15	5.3	2.85	
Van Ness/S Van Ness	Golden Gate	Washington	N	0.83	16.6	5.3	3.1	16.9	5.7	2.96	
Van Ness/S Van Ness	Washington	Lombard	N	0.58	22.4	7.9	2.8	26.6	8.1	3.30	
Fulton	Park Pres.	Arguello	E	0.73	25.0	8.3	3.0	26.1	7.1	3.69	
Main	Mission	Market	N	0.13	14.4	4.1	3.5	16.3	4.1	4.02	
Potrero	C. Chavez	21st Street	N	0.61	17.0	6.4	2.7	23.6	5.8	4.10	24th Street to 21st Street

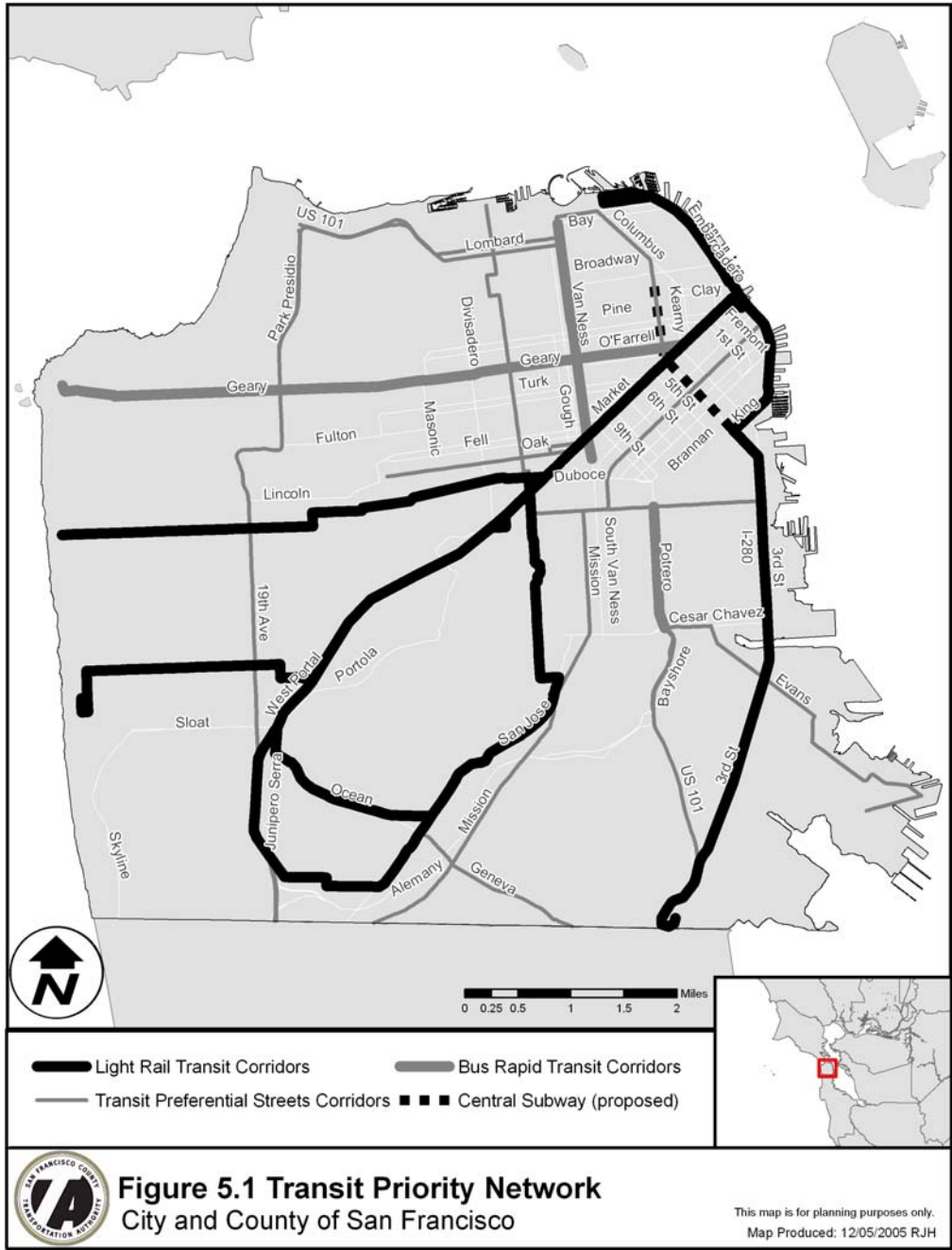


Table 5-3
Transit Speeds (mph), Transit Priority Network, Spring 2007

Route Name	Direction	Segment Name	AM Speed	PM Speed
F-Market	Inbound	Market rail: Castro-Church	6.6	6.1
		Market rail: Church-Van Ness	6.4	5.6
		Market rail: Van Ness-7th	6.6	6.0
		Market rail: 7th-4th	7.5	6.0
		Market rail: 4th-1st	7.1	6.4
		Market rail: 1st-Steuart	5.5	5.1
		Embarcadero: Mission-Grant	8.7	7.8
	Embarcadero/Jefferson: Grant-Jones	5.0	4.3	
	Outbound	Beach: Jones-Stockton	7.0	4.6
		Embarcadero: Stockton-Steuart	8.6	7.6
		Market rail: Steuart-1st	5.5	4.3
		Market rail: 1st-4th	8.4	6.5
		Market rail: 4th-7th	8.6	6.0
		Market rail: 7th-Van Ness	6.8	5.8
Market rail: Van Ness-Church		7.7	5.6	
Market rail: Church-Castro	5.5	5.6		
J-Church	Inbound	San Jose: Ocean-30th	14.0	14.4
		Church: 30th-24th	7.7	7.2
		Church: 24th-Duboce	7.1	6.9
		Market: Van Ness-Embarcadero	11.0	9.8
		Embarcadero/King: Market-4th	7.9	7.3
	Outbound	King/Embarcadero: 4th-Market	8.4	7.4
		Market: Embarcadero-Van Ness	11.5	11.6
		Church: Duboce-24th	8.5	7.7
Church: 24th-30th	8.2	7.9		
San Jose: 30th-Ocean	15.4	14.6		
K-Ingleside	Inbound	Ocean/J.S.: Geneva - St. Francis	7.6	6.9
		West Portal: St. Francis-Ulloa	7.1	6.1
		Twin Peaks Tunnel: West Portal-Castro	17.4	16.1
		Market: Castro-Van Ness	10.0	11.1
		Market: Van Ness-Embarcadero	11.0	9.8
	Outbound	Market: Embarcadero-Van Ness	9.8	10.9
		Market: Van Ness-Castro	12.2	13.1
		Twin Peaks Tunnel: Castro-West Portal	16.2	15.6
		West Portal: Ulloa-St. Francis	8.1	6.1
		J.S./Ocean: St. Francis. - Geneva	8.9	6.9
L-Taraval	Inbound	46th/Taraval: Wawona-Sunset	8.5	8.7
		Taraval: Sunset-22nd	8.1	8.0
		Taraval/Ulloa: 22nd-West Portal	6.0	5.8
		Twin Peaks Tunnel: West Portal-Castro	17.3	16.2
		Market: Castro-Van Ness	10.2	11.0
		Market: Van Ness-Embarcadero	11.0	9.7
	Outbound	Market: Embarcadero-Van Ness	10.0	11.0
		Market: Van Ness-Castro	12.3	13.2
		Twin Peaks Tunnel: Castro-West Portal	16.3	15.6
		Ulloa/Taraval: West Portal-22nd	7.5	6.3
Taraval: 22nd-Sunset	9.2	7.8		
Taraval/46th: Sunset-Wawona	7.0	6.5		
M-Ocean View	Inbound	San Jose/Randolph: Geneva-19th	9.2	8.9
		19th/Right-of-Way: Holloway-St. Francis	7.7	6.2
		West Portal: St. Francis-Ulloa	7.1	6.1
		Twin Peaks Tunnel: West Portal-Castro	17.4	16.1
		Market: Castro-Van Ness	10.0	11.1
		Market: Van Ness-Embarcadero	11.0	9.8
	Outbound	Market: Embarcadero-Van Ness	10.0	11.2
		Market: Van Ness-Castro	12.3	13.2
		Twin Peaks Tunnel: Castro-West Portal	16.2	15.6
West Portal: Ulloa-St. Francis	8.1	6.1		

Route Name	Direction	Segment Name	AM Speed	PM Speed
		Right-of-Way/19th: St. Francis-Holloway	10.1	8.2
		Randolph/San Jose: 19th-Geneva	10.5	9.1
N-Judah	Inbound	Judah: La Playa-Sunset	7.3	7.6
		Judah: Sunset-19th	8.3	8.4
		Judah/Irving: 19th-Hillway	6.8	6.0
		Carl/Duboce: Hillway-Church	10.8	10.1
		Market: Van Ness-Embarcadero	11.0	9.7
	Outbound	Market: Embarcadero-Van Ness	9.8	10.1
		Duboce/Carl: Church-Hillway	14.1	12.5
		Irving/Judah: Hillway-19th	8.0	6.3
		Judah: 19th-Sunset	11.7	9.2
		Judah: Sunset-La Playa	8.1	7.2
T-Third	Inbound	Third: Sunnysdale-Carroll	10.8	11.2
		Third: Carroll-Evans	8.5	8.6
		Third: Evans-20th	12.5	12.2
		Third: 20th-King	7.5	7.6
		King/Embarcadero: 4th-Market	8.1	7.2
		Market: Embarcadero-Van Ness	11.5	11.6
		Market: Van Ness-Castro	12.3	13.2
	Outbound	Market: Castro-Van Ness	8.3	8.0
		Market: Van Ness-Embarcadero	11.0	9.8
		Embarcadero/King: Market-4th	7.7	7.2
		Third: King-20th	10.5	9.7
		Third: 20th-Evans	12.0	11.5
		Third: Evans-Carroll	9.4	8.3
		Third: Carroll-Sunnysdale	8.8	8.8
7-Haight	Inbound	Haight: Stanyan-Masonic	7.3	6.0
		Haight: Masonic-Fillmore	8.6	8.5
		Haight/Page: Fillmore-Market	4.9	6.2
	Outbound	Haight: Market-Fillmore	9.5	6.2
		Haight: Fillmore-Masonic	10.5	8.8
		Haight: Masonic-Stanyan	8.4	6.6
14-Mission	Inbound	Mission: San Jose-Lowell	8.8	8.9
		Mission: Lowell-Geneva	7.3	8.2
		Mission: Geneva-Ocean	8.6	7.9
		Mission: Ocean-Silver	6.8	6.9
		Mission: Silver-30th	9.0	8.9
		Mission: 30th-24th	7.8	7.0
		Mission: 24th-16th	7.7	6.1
	Outbound	Mission: 16th-24th	8.3	5.9
		Mission: 24th-30th	7.4	5.5
		Mission: 30th-Silver	10.7	8.7
		Mission: Silver-Ocean	9.0	6.7
		Mission: Ocean-Geneva	11.2	8.9
		Mission: Geneva-Lowell	8.5	7.9
		Mission: Lowell-San Jose	10.9	8.6
22-Fillmore	Inbound	18th/17th: 3rd-Kansas	9.4	8.2
		16th: Kansas-Bryant	6.9	5.2
		16th: Bryant-Mission	7.2	6.1
		16th/Church: Mission-Market	6.7	6.1
		Church/Fillmore: Market-Haight	6.4	5.4
		Fillmore: Haight-McAllister	5.9	5.0
		Fillmore: McAllister-Sutter	5.9	5.2
		Fillmore/Steiner: Sutter-Union	6.5	6.1
	Outbound	Steiner/Fillmore: Union-Sutter	6.7	5.5
		Fillmore: Sutter-McAllister	5.9	4.8
		Fillmore: McAllister-Haight	5.3	5.0
		Fillmore/Church: Haight-Market	5.7	4.8
		Church/16th: Market-Mission	6.2	5.6
		16th: Mission-Bryant	6.9	6.6

Route Name	Direction	Segment Name	AM Speed	PM Speed
		16th: Bryant-Kansas	6.5	5.9
		17th/18th: Kansas-3rd	9.5	9.8
30-Stockton	Inbound	Divisadero/Chestnut: Jefferson-Fillmore	7.9	7.1
		Chestnut: Fillmore-Van Ness	8.3	8.2
		North Point-Columbus: Van Ness-Union	6.1	5.8
		Stockton: Union-Sutter 30	5.7	4.6
	Outbound	Stockton: Sutter-Market	6.2	4.7
		Kearny/Sutter: Market-Stockton	5.4	4.3
		Stockton: Sutter-Union 30	5.5	4.5
		Columbus/North Point: Union-Van Ness	7.5	6.4
49-Van Ness	Inbound	Chestnut: Van Ness-Fillmore	9.6	7.9
		Chestnut/Broderick: Fillmore-Jefferson	7.0	6.9
		Van Ness: Market-McAllister	6.0	4.8
		Van Ness: McAllister-O'Farrell	6.0	5.5
	Outbound	Van Ness: O'Farrell-Union	6.1	6.4
		Van Ness: Union-North Point	5.5	6.8
		Van Ness: North Point-Union	6.3	6.5
		Van Ness: Union-O'Farrell	7.1	6.4
		Van Ness: O'Farrell-McAllister	6.4	6.4
		Van Ness: McAllister-Market	6.0	5.6

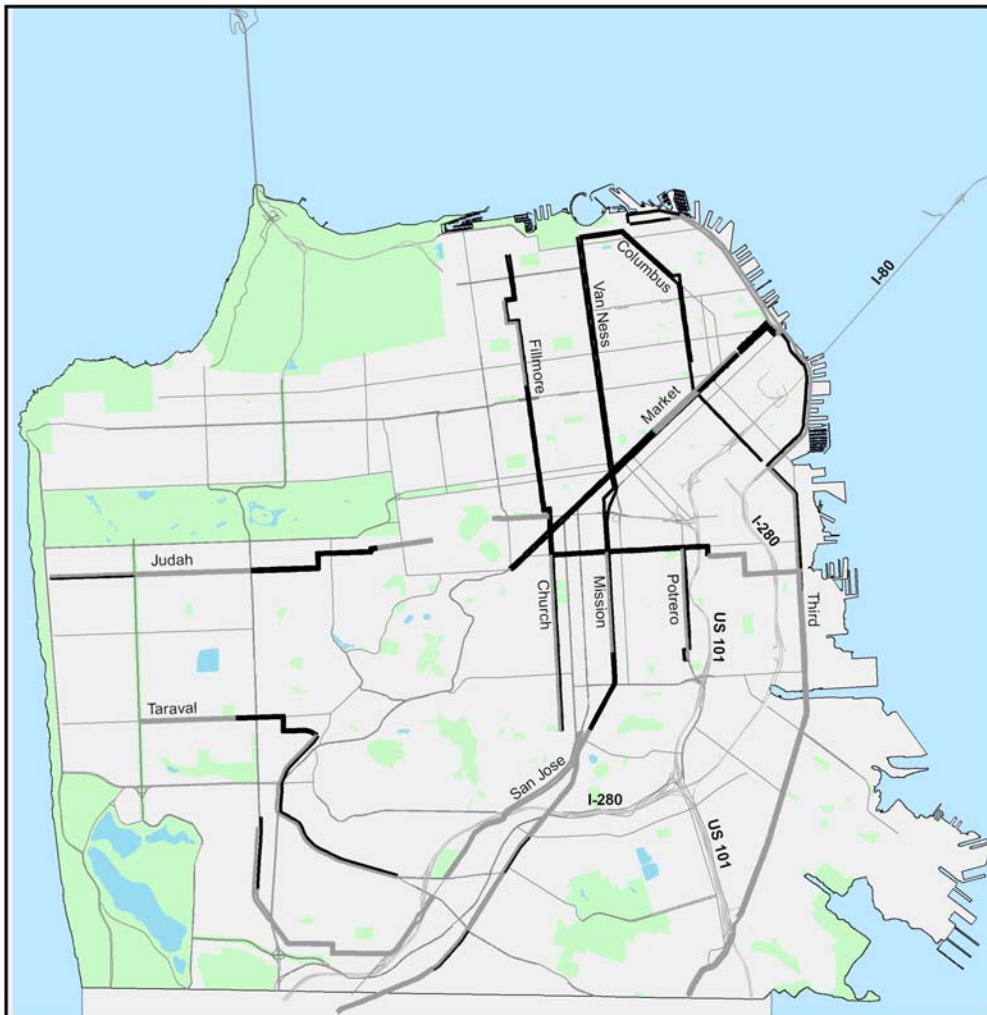


Figure 5-2 - Transit Priority Network AM Speeds, Monitored Segments

— Below 8 mph — 8 mph and faster

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



**San Francisco
Trolley Bus and LRT Speeds**

Spring 2007: AM Peak

0 0.5 1 Miles

This map is intended for planning purposes only.

Map Produced: 7/16/2007 JDK

Source: MTA AVL data, April 2007



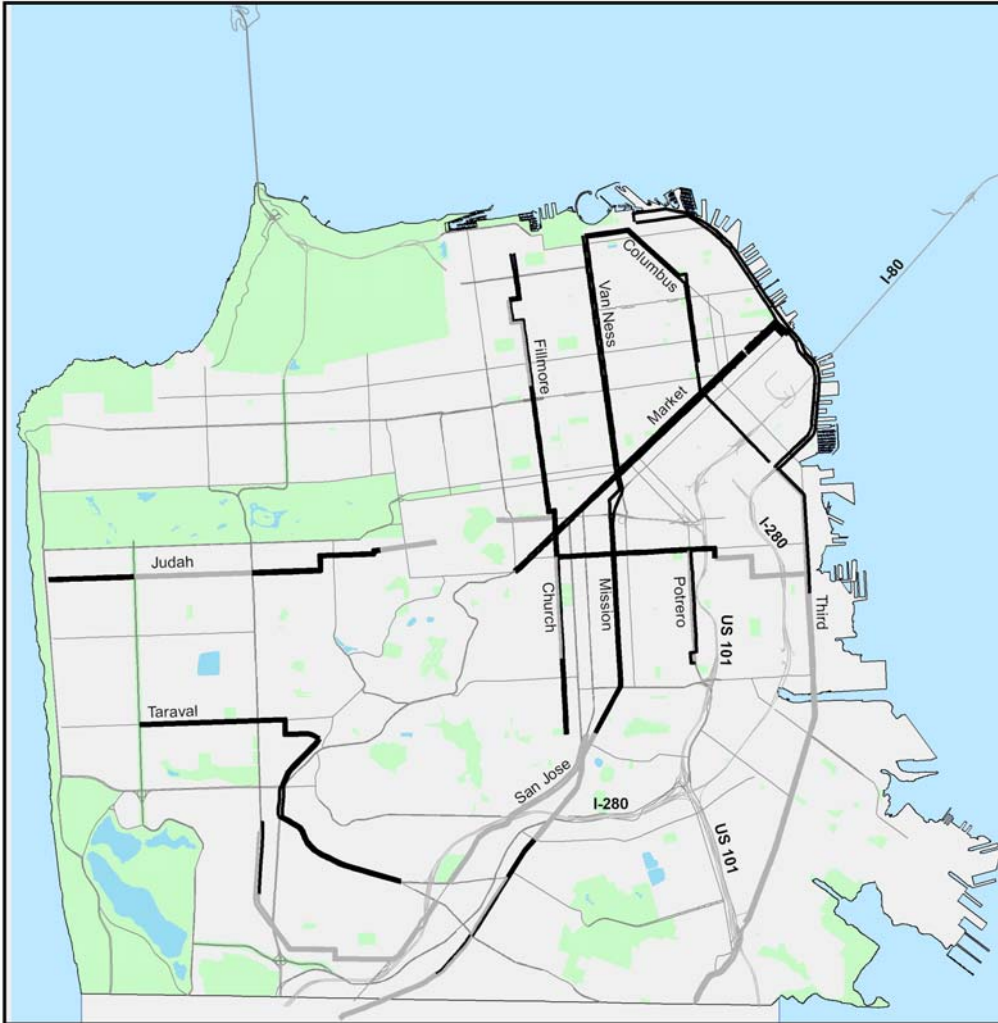


Figure 5-3 - Transit Priority Network Speeds PM, Monitored Segments

— Below 8 mph — 8 mph and faster

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



**San Francisco
Trolley Bus and LRT Speeds**
Spring 2007: PM Peak

0 0.5 1 Miles

This map is intended for planning purposes only.

Map Produced: 7/16/2007 JDK

Source: MTA AVL data, April 2007



Table 5-A

**Transit Service
Frequency and Coverage Standards
Muni**

Frequency Standard (headway in minutes)

Weekday	Peak	Base	Evening	Owl
Radial	10	15	20	30
Express	10	--	--	--
Cross-town	15	15	20	30
Feeder	20	30	30	--
Weekend	Base	Evening	Owl	
Radial	15	20	30	
Cross-town	20	20	30	
Feeder	30	30	--	

Coverage Standard

Walking distance to a route that runs at least 19 hours per day is one-quarter mile or less.

AC TRANSIT**Frequency Standard** (headway in minutes)

SERVICE TYPE	TIME PERIOD				
	Peak	Mid-day	Night	Owl	Weekend/Holidays
Transbay Express	10-30	--	--	--	--
Transbay Basic	10-15	30-45	45-60	--	30

Coverage Standard

AC Transit provides two levels of service to the Transbay Terminal in San Francisco. Transbay Express provides medium to high frequency peak-hour service between San Francisco and selected areas of the District where there is demand for transit services which BART cannot meet. Transbay Basic provides direct service between San Francisco and major East Bay areas that are not well served by BART; the service operates all day at a medium to high frequency on a local and/or limited stop basis.

Table 5-A (cont.)**BART**

Frequency Standard (headway in minutes)

LINE

TIME PERIOD	Pittsburg/ Bay Point	Dublin/ Pleasanton	Fremont	Richmond	Downtown San Francisco (City Center)
	Daly City	Millbrae	Daly City	Daly City	
Weekday Peak	5	15	15	15	2.7
Weekday Mid-day	15	15	15	15	3.8
Weekday Night	20	20	--	--	10.0
Saturday Day	20	20	20	20	5.0
Saturday Night	20	20	--	--	10.0
Sunday/Holiday all day	20 20	--	--	10.0	

Coverage Standard

BART rail service is provided between the hours of 4:00 a.m. and approximately 1:30 a.m. Monday through Friday, 6 a.m. to approximately 1:30 a.m. on Saturdays, and 8 a.m. to approximately 1:30 a.m. on Sundays and major holidays. Closings for individual stations are timed with the schedule for the last train beginning at approximately midnight.

BART has eight stations in San Francisco: Four spaced a half mile apart on Market Street and four at variable distances in the central and southern areas of the City.

Table 5-A (cont.)**CALTRAIN****Frequency Standard**

3 trains per hour during peak periods, supplemented by Baby Bullet express service twice per hour during peak periods.

30-minute headways on weekday midday service. 60 minute headways on weekends.

Coverage Standard

The Caltrain system operates on a 77.2-mile route between San Francisco and Gilroy. There are 33 stations in the 19 cities that Caltrain serves, including two in San Francisco. San Francisco is also directly served by the Bayshore Caltrain station, located immediately south of the City/County limits in San Mateo County.

GOLDEN GATE TRANSIT**Frequency Standard** (headway in minutes)

SERVICE TYPE	TIME PERIOD	
	Peak	Base
Commuter Bus	-- ¹	--
Basic Service Bus	30	60
Larkspur Ferry	30	1 hr.
Sausalito Ferry	70	1.5 hrs.

Coverage Standard

Commuter bus routes operate weekdays, in the peak travel direction, between residential areas in Marin and Sonoma Counties and the San Francisco Financial District and Civic Center.

Basic service routes operate all day, seven days a week, between the Transbay Terminal and Civic Center in San Francisco and various suburban centers within Marin and Sonoma Counties.

The Sausalito Ferry operates with one boat and can only provide service as quickly as it can travel back and forth between Sausalito and San Francisco, usually an hour and a half.

¹ For commuter bus service, most Golden Gate Transit bus lines operate two to five times per hour during peak periods in the peak direction. Currently, there are 18 bus lines providing express commuter service to/from San Francisco at frequent intervals during peak commuter hours Monday through Friday except holidays.

Table 5-A (cont.)**SAMTRANS****Frequency Standard** (headway in minutes)

SERVICE TYPE	TIME PERIOD	
	Peak	Base
Commuter Bus	30	--
Basic Service Bus	30	60
Trunk Bus routes (El Camino)	15	30

Coverage Standard

Within walking distance (0.25 mile) of existing route, which covers the majority of urbanized San Mateo County

Table 5-B**1999 Proposition E Service Standards and Goals (Muni)**

STANDARD	FY	FY	FY	FY	FY	FY	FY	FY	FY	FY
	99/00 Actual	00/01 Goal	00/01 Actual	01/02 Goal	01/02 Actual	02/03 Goal	02/03 Actual	03/04 Goal	03/04 Actual	04/05 Goal
Vehicles that run on time ²	46%	65%	65.5%	70%	71.9%	75%	70.9%	85%	68%	85%
Scheduled service hours delivered	95.6%	96.5%	94.5%	97%	97.8%	97.5%	94.5%	98.5%	97.3%	98.5%
Vehicles too full to board	0.15%	<5%	0.00%	<5%	0.33%	<5%	1.62%	<5%	2.11%	<5%
Peak period load factors (% of capacity)	Various	No greater than 85%	13 lines exceeded goal	No greater than 85%	8 lines exceeded goal	No greater than 85%	2 lines exceeded goal	No greater than 85%	3 lines exceeded goal	No greater than 85%
Actual headways vs. scheduled	45%	80%	56.8%	85%	72.1%	85%	74.8%	85%	69.2%	85%
Vehicle availability	99.6%	98.5%	99.5%	98.5	99.2%	98.5%	99.6%	98.5%	99.0%	98.5%

Source: San Francisco Municipal Railway *FY2006 – FY2025 Short Range Transit Plan*, 2005.² On time defined as no more than one minute early or four minutes late as measured against a published schedule.