



Introduction to the TEP

1. Introduction to the TEP and briefing binder
2. Goals
3. Major tasks
4. Who is involved
5. Schedule
6. Muni system overview

Introduction to the TEP

INTRODUCTION

This chapter provides a brief overview of the Transit Effectiveness Project (TEP), including its goals, its major tasks, who is involved, and schedule.

TEP GOALS

The TEP is an 18-month effort (expected to end in December 2007) jointly undertaken by the City's Controller's Office and the Municipal Transportation Agency (MTA) to conduct a comprehensive review of the existing Municipal Railway (Muni) transit system. Its goals are to:

- Improve Muni's overall performance and promote the long-term financial stability of MTA.
- Strengthen Muni's ability to respond to current travel needs, and provide a blueprint for future service.
- Make Muni service more attractive.
- Make Muni service more economical and cost-effective.
- Develop a multi-year action plan for MTA that clearly articulates goals, strategies and resources, and provides a 5 to 7 year road map for the MTA Board and management.

MAJOR TASKS

The major tasks of the TEP include:

- Define a vision for public transit in San Francisco.
- Review Muni’s performance trends and explore best transit planning practices in comparable areas.
- Conduct a major study of travel patterns and markets including a survey of San Francisco residents to determine how Muni can be attractive to more people for more trips.
- Revisit service design policies to ensure alignment with current and projected realities.
- Complete a comprehensive review and benchmarking study ensuring that Muni is properly staffed and utilizes best practices in transportation management and delivery.
- Develop cost allocation model and financial plan.
- Develop recommendations for improved service, improved service delivery, and provide an implementation road map for management and staff.

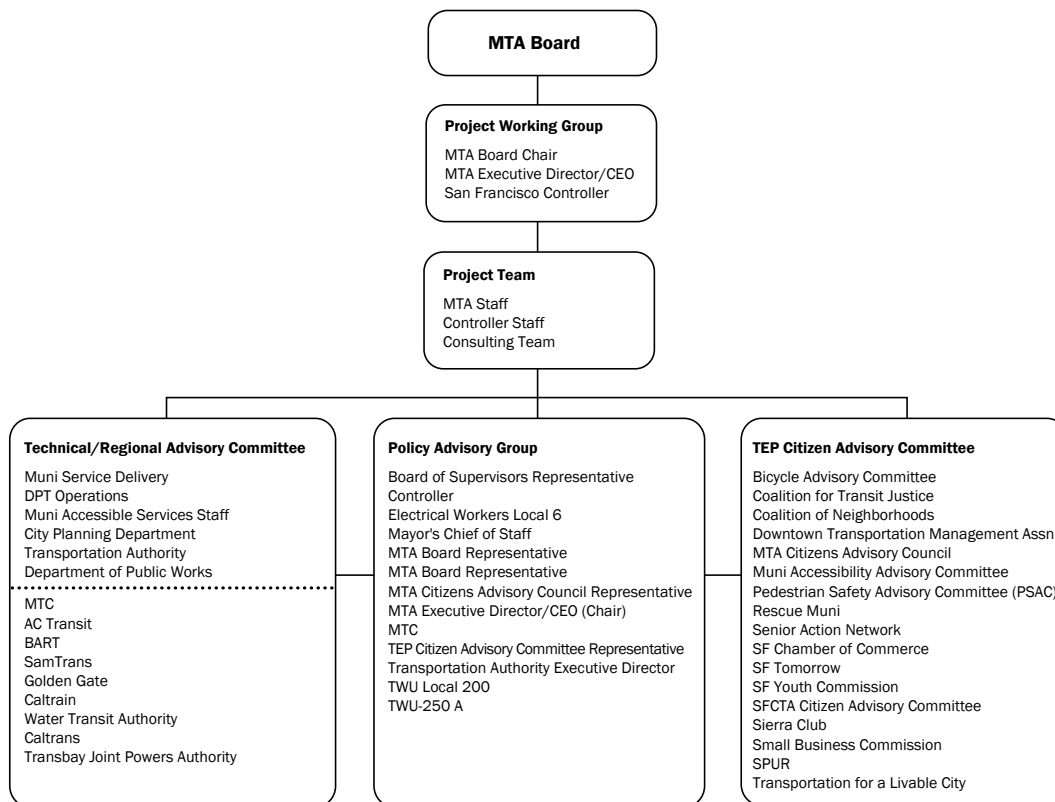
WHO IS INVOLVED

As a comprehensive review of Muni, the TEP will require the participation of a wide range of MTA staff, as well as staff from other city departments. A stakeholder input plan was developed to help the TEP process achieve the best results possible. Its structure is illustrated in Figure 1-1.

The consulting team includes:

- Transportation Management & Design, Inc. (TMD)
- AECOM Consulting
- Cambridge Systematics
- CHS Consulting Group
- Circle Point
- EIP Associates
- Jungle Communications
- Nelson/Nygaard Consulting Associates Inc.

Figure 1-1 Stakeholder Input Structure



SCHEDULE

What follows is a high level overview of the TEP schedule:

- Spring 2006 – Project Initiation
- Summer 2006 – Visioning and goal setting
- Summer to Fall 2006 – Service evaluation and city wide market research
- Fall 2006 – Early action items
- Fall 2006 to Summer 2007 – Planning
- Fall to December 2007 – Revisions and approvals

ABOUT THIS BRIEFING BOOK

This briefing book has been assembled to provide the necessary background information and performance data to make well-informed decisions about Muni and, more generally, the future of transportation in San Francisco. It will be particularly useful for the Policy Advisory Group and other key stakeholders during the TEP's initial visioning and goal setting, but is likely to remain a useful reference throughout the project.

It contains the following sections:

- Chapter 2 – Summary of key issues that have emerged from the creation of this briefing book that the TEP will address
- Chapter 3 – High level overview of transportation in San Francisco and profile of who currently uses Muni (and who does not)
- Chapter 4 – Summary of the results of stakeholder interviews.
- Chapter 5 – Comparison of Muni to its peers to provide context for understanding Muni's performance, and compendium of peer data for easy reference
- Chapter 6 – Review of Muni's past performance and high level examination of the underlying factors. Includes compendium of relevant Muni data as reported for Proposition E.
- Appendix – San Francisco's existing transportation policies

MUNI SYSTEM OVERVIEW

The San Francisco Municipal Railway (Muni) operates public transportation in San Francisco. It is the Bay Area’s largest transit operation and seventh largest in the U.S. It carries about 686,000 trips every weekday – 216 million trips per year – with 4,800 employees and an annual budget of over \$600 million.

Muni’s fleet of about 1,000 vehicles, over half of which are electric, consists of subway-surface light-rail vehicles (Metro streetcars), electric trolley buses, diesel buses, cable cars, and historic streetcars (see Figure 1-2 for more fleet information).

Figure 1-2 Muni Transit Vehicles and Lines

Type	Vehicles	Lines	Round-Trip Route Miles
Diesel bus	495	54	789
Trolley bus	333	17	191
Metro streetcar	151	5	78
Historic streetcar	26	1	6
Cable car	40	3	10
Total	1045	80	1074

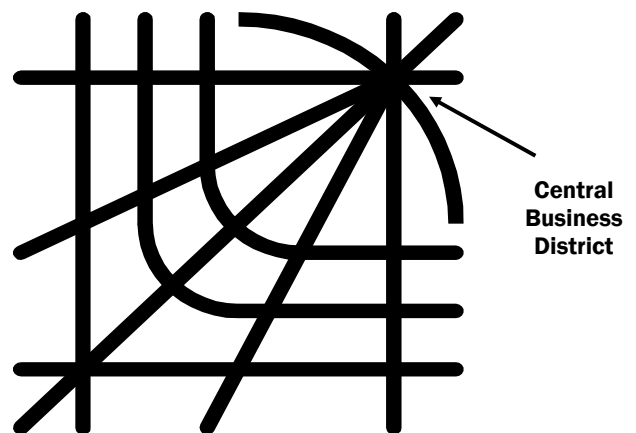
Service Design

Muni’s service is based on service design standards. These standards guide decisions to determine the spacing of routes through the City, the frequency of buses and streetcars, the spacing of stops along a line, and the average loads experienced by passengers on vehicles (Muni’s current standards are listed in the Appendix). The standards also guide development of other programs that contribute to improved transit service.

In 1982, Muni’s service network was overhauled to create the current network. This overhaul entailed changes on 25 lines and was the single largest set of route changes in Muni’s history. The new route structure succeeded in serving the existing riders and attracting new riders.

Because San Francisco’s Central Business District (CBD) is not in the center, but on the edge of the city with water on two sides, the transit network is a modified grid, illustrated by the conceptual diagram in Figure 1-3. The downtown-focused radials are intersected by circumferential “crosstown” lines. The modified grid is focused on the CBD, but is designed for a rider to get from any point in the City to any other point with no more than one transfer.

Figure 1-3 Schematic Diagram of Current Muni Service Network





Key Issues for the TEP

1. Key issues for TEP decision makers
2. Key concepts

Key Issues for the TEP

This chapter summarizes the key issues that emerged during the creation of this briefing binder, highlighting the issues that the TEP will need to address during the project's goal setting and visioning process. References point to chapters throughout this binder that provide more information about key issues.

INTRODUCTION

For the first time in nearly 30 years, Muni has the opportunity to address questions about its mission, its role in the City, and the services it provides. Questions to be addressed by the TEP include:

- What are the services that Muni should provide to maintain or increase ridership and mode share?
- How can Muni ensure that the services it provides are the highest quality possible?
- What organizational structure and level of staffing is necessary to support this service?
- What is the right relationship between Muni and other modes?

The answers to these questions go beyond looking at Muni or even the MTA in isolation, but rather require thinking about how Muni fits into an overall vision for San Francisco. When asked "What is your vision for transportation in San Francisco?" most stakeholders answered with visions of the city, including its economic vitality, the beauty of its streets, and overall quality of life.

A vision for Muni, and therefore transportation in San Francisco, is necessarily a vision for San Francisco as a city. Few cities are able to set aside the time and resources required to think coherently and strategically about the relationship between their public transit system, the city's mobility, and goals for the future. The TEP is an extraordinary once in a generation opportunity to articulate a vision for a transportation system that reflects the values of San Francisco.

We cannot talk about urban transport until we know what kind of city we want, and to talk about the kind of city we want, we have to know how we want to live.

– Enrique Penalosa, Former Mayor of Bogata

A city's internal transportation system—the layout of its streets and roads the layout of streetcar systems and subways—determines the character of the city, how its citizens live and work. Different transportation systems produce different types of cities, and the places within them, as effortlessly as different types of soils produce different sorts of shrubbery, flowers, and trees.

– Alex Marshall, *How Cities Work*

KEY ISSUES FOR THE TEP

What follows is a list of key issues for the TEP that emerged from stakeholder interviews and from the summary of peer data and Muni performance trends that follow.

Developing a Vision with Measures for Success

In interviews, stakeholders were nearly unanimous in supporting the TEP as an opportunity to develop a comprehensive vision for transportation in San Francisco. Existing City policy, especially the Transit First language of the City Charter (see the Appendix to this binder), imply a vision for San Francisco – one where transit plays a dominant role on City streets – that has not been fully realized or translated into a clear vision with related concrete goals. The TEP process promises to change transportation in San Francisco for the better, but must provide specifics about what “better” means.

Stakeholder interviews highlight the absence of clear vision and goals as a critical problem with Muni and the MTA. Although Proposition E requires Muni to report on a comprehensive set of performance measures, by themselves these measures do not specify a clear direction for MTA to use for managing transportation in San Francisco. The TEP is an opportunity to give both the MTA and Muni clear, and possibly bold, direction.

Stakeholders were asked what the “ultimate measure of success” should be for MTA and a majority indicated that transit mode share (the percent of all trips made on transit) would be an excellent indicator of success because it encompasses so many other important goals including rider satisfaction and overall transit performance. Productivity and cost efficiency standards were also mentioned as important to an overall vision where transit is so easy and pleasurable to use that any San Franciscan can contemplate life in the City without a car. One of the key issues for the TEP will be refining the MTA's measures of success to develop simple and easily understood metrics that evaluate how well Muni and MTA are doing in achieving its goals.

Increasing Muni's Ridership and Mode Share

Historical data show that Muni's ridership and mode share have either not increased or fallen over the last 20 years. Many of the reasons for this decline are out of Muni's control: car ownership rates in San Francisco have risen with incomes, employment centers have dispersed more widely in the Bay Area, and more people are working at home. About two percent of Muni's overall ridership decline of 12 percent over the last 20 years can be attributed to BART, which carries some of the local San Francisco trips that had previously been served by Muni (see Chapter 6 for a discussion of ridership and mode share trends).

Almost all stakeholders voiced a desire for Muni to become more relevant in the lives of San Franciscans by carrying more riders and significantly increasing its share of all trips. To attract more riders, Muni may need to offer new or different services to expand its appeal to different markets and to expand its market share among current riders. Stakeholders also emphasized that the quality of Muni service is one of the factors in shifting the mode share that the MTA can control directly, and that better service, measured by speed, reliability, and customer experience, will encourage everyone to ride transit more.

Some stakeholders stressed that increasing ridership and mode share is not entirely a Muni issue, but also an MTA and City issue. Improving Muni service enough to attract many new riders, often from their cars, will likely require changing how street space is allocated and managed to support improved transit service, and developing policies related to parking and congestion that further support the MTA's goals for Muni. This can be guided by the City's Transit First policy and Proposition E, which created the MTA to manage all transportation modes more coherently and effectively.

The factors that influence ridership are described below.

How can Muni attract more riders?

The factors that make transit an attractive choice for more trips have been well-established by academic research and real-world experience. They include:

- **Reliability** – ability to depend on transit for important trips and to arrive at one's destination about when one expects to. Reliability strongly influences rider confidence and perception of a transit system.
- **Travel time** – rich or poor, people typically place a high value on their time. When choosing how to make a trip, people's choices are most sensitive to

Why is increasing transit ridership in San Francisco important?

Better Muni service is a crucial factor in:

- Improving the quality of life for those that live, work, and visit in San Francisco.
- Increasing the City's economic competitiveness.
- Improving environmental health by reducing car trips.
- Maintaining or reducing current levels of auto congestion and parking demand which can not be accommodated on existing street infrastructure.
- Maximizing the ability of its limited street network to move people.

door-to-door travel times. Factors that influence travel time include:

- Speed of transit vehicles.
- Reliability – while reliability is important for customer experience, it is also a factor in travel time since a reliable system reduces the variability in waiting times which contribute significantly to travel time, especially in a local system with relatively short trips.
- Frequency – an important factor in total travel times, influencing perceived and real wait times for transit riders.
- Transfers – transfers add to the coverage of a transit system, but too many transfers or inconvenient transfers add to a passenger's total trip time.
- **Passenger loads** – transit is less attractive when passengers must stand for long periods of time, especially when vehicles are very crowded. According to Proposition E data, about 30% of Muni vehicles are overcrowded.
- **Coverage** – whether or not transit service is provided near one's origin and destination. Coverage is related to convenience, since passengers will not need to travel long distances to reach a transit route if coverage is good.

- **Span** – the hours of service, including late night service (whether it operates 18 to 24 hours a day) and whether or not fast, frequent, and reliable service is provided all day (rather than just at peak times).
- **Cost** – potential passengers weigh the cost and value of using transit versus the out-of-pocket costs and value of choosing another way to make a trip.
- **Information** – the ease with which current and potential riders can learn about the system, how to use it, and what’s changing.
- **Appearance** – of vehicles, stations, stops, and staff.
- **Comfort** – including cleanliness, seat comfort, and the severity or amount of acceleration/ deceleration, both lateral and longitudinal.
- **Safety and security** – can use transit with the expectation that you will arrive safely with no threat to your personal security.
- **Customer service** – Portland’s Tri-Met is considered a model transit agency in their attention to the “total transit experience,” which adopts a broad definition of customer service. They strive to make transit as attractive and user-friendly as possible from before you leave your home until you reach the door of your destination. Like successful businesses, they have profited from paying close attention to the needs, desires, and perspective of their customers.
- **Rider experience** – Collectively, the preceding factors contribute to the overall experience of using transit. This is the bottom line of customer satisfaction.

The extent to which San Franciscans value one or more of these factors over others will be the subject of the study’s market research. The TEP will explore each of these factors in detail, with guidance from the Policy Advisory Group, Technical/Regional Advisory Committee, and Citizen Advisory Committee.

How Can Muni Become More Cost Effective

Another key question for the TEP will be how Muni can maximize the service it provides by stabilizing or reducing its cost per passenger trip. There are two approaches to improving cost effectiveness:

Increase productivity

Productivity is defined as the number of people carried per hour each vehicle is operated. The cost to operate a bus is roughly the same regardless of how fast or slow it moves, the

size of the vehicle it operates, or whether a lot of people ride or only a few. As the number of passengers who board per hour increases, the cost per passenger trip goes down.

To illustrate, if it costs \$100 per hour to operate a bus, it costs \$5.00 per person to carry 20 people in an hour, but it costs only \$1.25 per person to carry 80 people in that same hour. Because people get on and off the bus all through the hour, the bus carrying 80 people in an hour may never be overcrowded, but will be much more productive than the bus that carries only 20 people in an hour.

As a system, Muni is already one of the most productive transit systems in the country, second only to New York City among the peer systems studied. However, in a very small and dense geographic service area such as the City of San Francisco, Muni can expect to be an industry leader in this area.

Muni can increase productivity by attracting more riders or by increasing average transit speeds so that each bus can provide more service in a vehicle hour. Strategies to attract more riders were described above. As a system, Muni’s speed has declined by about 1% per year for the last 20 years (See Chapter 6 for a discussion of transit speeds). Keys to increasing transit speed include:

- **Design vehicles and stops for speed** – Low floor buses, level with boarding platforms and sidewalks, more and larger doors, and other enhancements can help to speed boarding and alighting and make vehicles more accessible, especially for riders that generally take extra time.
- **Design fares and collection policies for speed** – Allowing all door boarding and helping passengers to know where to stand for boarding will reduce time spent at stops. Prepaid fares that eliminate cash transactions on vehicles speed boarding. This requires enhanced proof of payment and other techniques for moving large numbers of people quickly.
- **Transit Priority Streets that protect transit travel time** – There are a host of techniques for improving transit travel time, ranging from exclusive transit lanes, to queue jumps at intersections, to various signalization enhancements. Each of these has impacts on other modes and each offers different levels of effectiveness in maintaining transit speeds. Other cities, such as Seattle and Minneapolis, have developed standards for transit speeds on priority routes that are based on maintaining transit speeds (including all stops and other forms of delay) at a minimum percentage of the posted speed limits. As transit speeds

deteriorate measures are taken to enhance speed, including removing auto lanes if needed. The MTA cannot realize the San Francisco's Transit First policy because it does not have the full authority to make these kinds of improvements as needed to protect travel time.

- **Reduce the number of stops** – Wider spacing of transit stops has been shown to both reduce in-vehicle travel times and improve reliability. Travel times are reduced because buses must decelerate and accelerate less frequently, and there are fewer delays caused by pulling in and out of traffic. Fewer stops increase reliability by avoiding these same unpredictable delays at stops, and by increasing the chances that the bus will stop at each stop along its route for a predictable amount of time. Frequent stops increase the probability of bunching and gaps in service.

Contain or reduce the cost per hour of service

Muni currently provides approximately 3.3 million service hours per year. Because most of the costs of operating transit service are related to labor (typically about 75%), Muni can affect unit costs primarily through efficiencies. Stakeholders emphasized the need to maintain a highly skilled and consistent work force, and commented on the need to improve the work environment, especially for Muni's transit operators. However, stakeholders also recommended a number of areas for potential costs savings:

- **Reduce Worker's Compensation and Disability costs** – Keeping the workforce working is one of the best ways to reduce unit costs. This includes initiatives to reduce driver assaults, increase ergonomics, and keep employees healthy – investments that can ultimately pay dividends.
- **Focus on preventative maintenance** – Fleets are often asked to go beyond their useful lives waiting for replacement. Preventative maintenance is often deferred in times of financial constraint because its impact can not readily be seen. Yet, keeping vehicles running efficiently and longer between breakdowns helps to control costs.
- **Use technology to improve efficiency** – Next-Bus technology has the potential to become a line management tool that will “see” where buses are throughout the system. Automated passenger counters can provide almost real time information about loading patterns, allowing for service adjustments that

increase efficiency. A whole host of new technology tools are available to improve system efficiency.

The TEP should focus on both productivity and cost efficiency to allow Muni to provide the maximum amount of service to the maximum number of riders possible in San Francisco.

Reliability as a Key Performance Measure

Reliability means different things to different people, yet it is cited by stakeholders as the most important concern of Muni riders. In many transit systems, saying a route is not “reliable” means that the transit vehicle is not arriving according to its printed schedule; but most Muni riders do not use schedules. Muni is designed to operate frequently enough that a rider can simply go to the stop and have confidence that the transit vehicle will arrive in a relatively short time. Even the least frequent Muni routes are scheduled to operate every 20 minutes during most times of day.

No one likes waiting, but San Franciscans may have an even lower tolerance for waiting. Our standards are likely to have increased with our incomes and as we have come to place a higher value on our time.

Reliability is so crucial to rider satisfaction because it influences whether or not people can count on Muni to make important trips, and their confidence that Muni will transport them to their destinations when expected. More reliable service shortens door-to-door travel times by reducing the amount of time people budget to wait for transit and, once on the bus, by making travel times more predictable.

By its own measures, Muni's reliability has plateaued or declined after some improvement in the past five years. Schedule adherence is less than 70% for the system, despite many efforts to increase reliability. The TEP will focus on all contributing factors to reliability including:

- **Line management** - Many stakeholders focused on the need for enhanced line management and new techniques to accomplish line management including using technology and centralized control of lines.
- **Management of vehicles** – This includes buying the right vehicles, maintaining an appropriate spare ratio and maintaining vehicles so that they are available for service.
- **Management of staff** – Having the right number of operators and related staff available every day and getting the system started right from the first pull out contribute to all-day reliability. Missing runs, late

pull outs and other controllable factors compound to create bunching and gaps in service.

- **Create a culture of performance** – Many stakeholders cited the need for a “culture of performance” at Muni that is similar to the culture in some private businesses such as Federal Express. At Fed Ex, individual employees are given very wide latitude to make decisions that will get packages delivered on time. Each time a package is not delivered properly it is considered a “failure.” A system that is designed around rewarding success and providing the tools, responsibility, and authority for creating success will always do better than one where the value is placed on having a good excuse for failure.
- **Use the techniques for enhancing speed to enhance reliability.** Each of the techniques described in the previous section on enhancing speed can also be used to enhance reliability.
- **Change measures of reliability.** Simply changing the way reliability is measured will not improve reliability as experienced by riders. However, emphasizing headway adherence – the time between vehicles – rather than schedule adherence, especially on routes that run frequently, will more accurately match the measure to the way passengers experience reliability. Passengers talk about bunching and gaps rather than about the on-time performance of any one vehicle. A second possibility is to make a distinction between relatively minor and major issues. In a mixed traffic urban system, passengers have a high tolerance for some variability in their service but a very low tolerance for major delays. Distinguishing the degree of variability in reliability may allow resources to be more carefully allocated.

Amount and pace of change

The vision articulated in the TEP process is likely to require some changes to Muni’s operations, service design (e.g., the layout of the routes), as well as changes to the design and management of San Francisco streets. The vision outlined by the TEP will imply the amount of change that will be required to realize this vision and meet goals.

Change in San Francisco, as well as within the MTA, is typically a difficult process. Within organizations as large as Muni and the MTA, changes to how transit service is delivered or how streets are managed also usually require an enormous amount of staff effort. In the City, attempts to improve Muni’s service over the years have proven that it is typically more difficult to improve service than to maintain the status quo. Change usually is accompanied by protest, regardless of how positive that change might be, or the net social benefit. These factors will temper the desired pace of change.

In addition to the amount of the change, the TEP will need to decide how aggressively the MTA should pursue these improvements. How quickly should the MTA strive to realize this vision for the City? The Project Working Group’s determination of the appropriate pace of change is likely to be informed by an assessment of the ability of the public and the MTA to absorb change, the gravity of the problems the TEP is intended to address, and an estimation of the magnitude of the benefits that will accompany any improvements. Implementing the TEP will require maintaining a focus on the City as a whole and on policies that are broader than any one neighborhood, route or constituency. Proposition E gives the MTA Board the independence it needs to implement difficult choices, but it needs the support of all levels of City government to either provide support or at least remain neutral on any proposed changes.