TRANSIT EFFECTIVENESS PROJECT (TEP)
IMPLEMENTATION STRATEGY

DISCUSSION DRAFT SUBJECT TO CHANGE April 5, 2011

Prepared for: **SFMTA** | Municipal Transportation Agency

and City & County of San Francisco Office of the Controller

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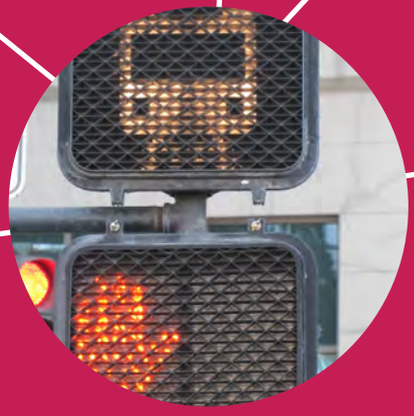


Table of Contents

Tables

Figures

Acronyms

APC	Automatic Passenger Counter
BRT	Bus Rapid Transit
CEQA	California Environmental Quality Act
EIR	Environmental Impact Report
FTA	Federal Transit Administration
FY	Fiscal Year
GGT	Golden Gate Transit
LIS	Long-term Investment Studies
MTC	Metropolitan Transportation Commission
Muni	San Francisco Municipal Railway
NEPA	National Environmental Policy Act
O&M	Operations and Maintenance
OWE	Overhead Wire Expansion
PB	Parsons Brinckerhoff
QA	Quality Assurance
QC	Quality Control
SCI	Systemwide Capital Improvements
SFCTA	San Francisco County Transportation Authority
SFMTA	San Francisco Municipal Transportation Agency
SFMTAB	SFMTA Board of Directors
SFSU	San Francisco State University
SI	Service Improvements
TEP	Transit Effectiveness Project
TSP	Transit Signal Priority
TTPI	Terminal and Transfer Point Improvements
TTRP	Travel Time Reduction Proposals
YOE	Year-of-Expenditure

1. EXECUTIVE SUMMARY

For the first time since the late 1970s, the City and County of San Francisco is comprehensively assessing and revamping its unique transit system, which consists of historic streetcars, light rail vehicles, bio-diesel and bio-diesel hybrid electric buses, electric trolley coaches and cable cars. The San Francisco Municipal Transportation Agency (SFMTA or the Agency) in partnership with the San Francisco Office of the Controller, has conducted extensive data analysis, best practice research and public outreach. This work has shaped proposals for meaningful improvements on key routes and identified needed investments to ensure cost-effective customer service and performance.

The implementation strategies outlined in this document provide general guidance, management strategies and tools, and concepts to implement the various recommendations within the TEP. The strategies proposed in this document do not establish policy nor usurp the authority of any City policy-making bodies. This document merely serves as a guidance and management tool to support the revamping and continued assessing of the complex and uniquely designed transit system. Also, the strategies identified herein will provide insight into the various approaches and best practices used in the transportation industry to integrate and make deliberate capital investments into the transit system based upon the proposals identified in the TEP.

The purpose of this document is to provide TEP implementation guidance to support decision-making processes for Agency staff and the SFMTA Board of Directors (SFMTAB) by answering the following questions:

- What is the TEP and what is it trying to accomplish?
- What service improvements and capital projects are proposed to be implemented and when?
- What steps are necessary to ensure that the TEP is successfully implemented?

Focusing on efficiency and effectiveness to transform and maximize service delivery, the TEP aims to achieve the following goals:

- Improve service reliability;
- Reduce travel time;
- Improve customer experiences; and
- Improve service effectiveness and efficiency.

A key outcome of the planning phase was a service policy framework that clarified where and how investments should be made to the system. This framework organized Muni services into four transit categories:

- **Rapid Network:** These frequent, heavily used bus routes and rail lines make up the backbone of the Muni system and would be high priorities for service and customer amenity enhancements. The rapid network would be supported by travel time reduction proposals (TTRP), systemwide capital improvements, and service improvements.
- **Local Network:** These essential routes complement and connect to the Rapid Network, allowing customers to get to most destinations in San Francisco with no more than one transfer.
- **Community Connectors:** This category includes lightly used bus routes that circulate through San Francisco's hillside residential neighborhoods and fill in gaps in coverage to connect customers to key transit hubs.
- **Specialized Services:** These routes are tailored to serve a particular market at limited times of day, and include express routes, commuter connections to BART and Caltrain stations, and ballgame routes or lines.

1.1 Initiatives Overview

When combined with the ridership surveys, data analysis and best practices research, the planning phase identified the following categories of initiatives that comprise the TEP implementation strategy:

- **Service improvements** – This category includes physical route changes and frequency improvements that are proposed to be implemented in two phases—in fiscal year (FY) 14[1] and in FY 16—pending resource availability. These changes would direct services where they are needed and streamline circuitous routes.
- **Travel time reduction proposals (TTRP)** – This category includes traffic engineering changes, stop spacing optimization and customer amenity improvements along corridor segments of the TEP-recommended rapid route network. These measures, supported by traffic signal priority work, would improve the speed and reliability of the SFMTA's most heavily used transit routes while also enhancing the customer's waiting experience.
- **Systemwide Capital Improvements** – This category includes traffic engineering changes to improve speed and reliability along non-TTRP corridor segments, stop improvements that would enhance accessibility and

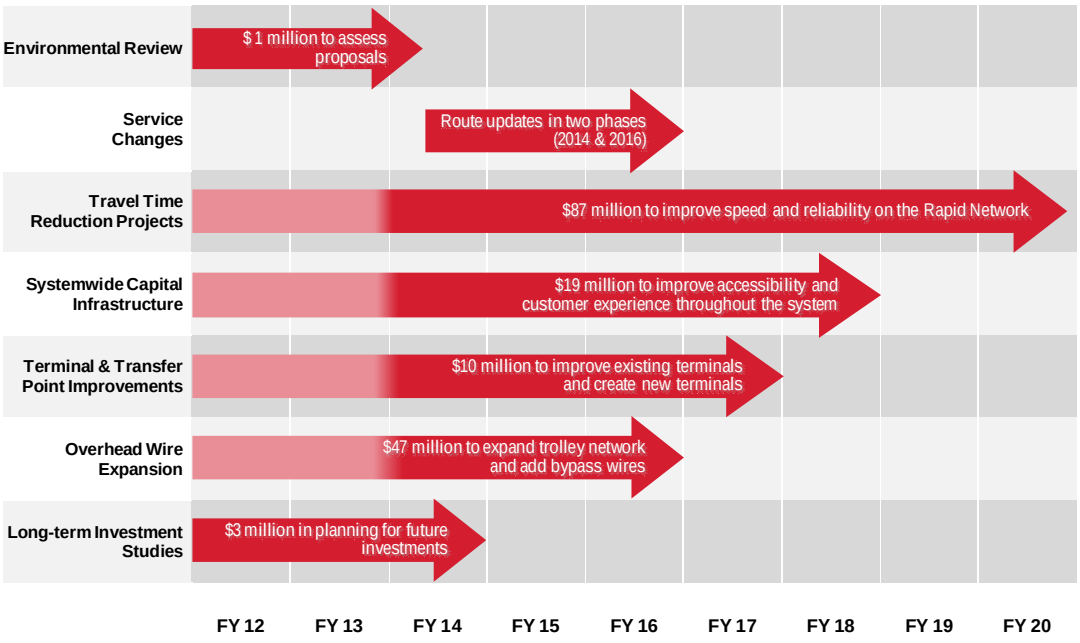
[1] The SFMTA fiscal year is July 1–June 30, so FY 11 is July 1, 2010 through June 30, 2011.

customer convenience at transit stops, and measures at selected stops to improve wayfinding and pedestrian crossings.

- **Terminal and transfer point improvements** – This category includes proposals to build new or update old route terminals and transfer points to support the service improvements and accommodate increased bus layovers, ease of customer transfers, and improved reliability.
- **Overhead wire expansion** – This category includes investments in overhead wire system to accommodate planned service improvements, improve terminal operations, and provide bypass wires to allow new limited-stop service routes to pass local service routes.
- **Long-term investment studies** – This category includes a TEP comprehensive communications plan and studies to guide future investments in the rail system and traction power system.

This strategy proposes to sequence the initiatives in a way that minimizes the respective implementation times and maximizes the planned beneficial TEP outcomes (e.g., reliability and travel time savings), by coordinating with the timing of other projects, and considering their current level of project development or readiness (amongst other sequencing criteria). Figure 1-1 depicts a high-level schedule of these TEP initiatives.

FIGURE 1-1: HIGH-LEVEL TEP IMPLEMENTATION SCHEDULE



Note: The costs outlined in this graphic only represent capital costs.

The TEP planning phase also focused on improving transit performance through improved service management practices. Key areas identified in the planning phase to improve service delivery included schedule development, operator availability, vehicle/infrastructure maintenance, supervision and traffic management. Since the TEP planning phase, the SFMTA has made progress in each of these areas. Although this document does not focus specifically on implementing service management practices, an ongoing focus on improved service delivery would be required to fulfill the goals of the TEP.

1.2 Cost and Funding Summary

Between FY 11 and FY 20, the TEP would require significant investments in planning, developing and constructing capital projects, including additional staff, materials and consulting services. As shown in Table 1-1, the total estimated capital cost of the TEP is $167 million in year-of-expenditure (YOE) dollars. There is a variance in annual spending, which reflects the fact that the earlier years would involve mostly studies, planning and design work, while later years would focus almost entirely on implementation (including procurement and construction).

TABLE 1-1: TEP CAPITAL PROPOSAL CATEGORY TOTALS

TEP Proposal Category	FY 11–FY 20 TEP Cost Estimate (YOE dollars)
Service Improvements	$434,000*
Travel Time Reduction Proposals	$87,231,000
Systemwide Capital Improvements	$18,977,000
Terminal and Transfer Point Improvements	$10,131,000
Overhead Wire Expansion	$46,888,000
Long-Term Investment Studies (including CEQA)	$3,476,000
TOTAL ESTIMATE	**$167,137,000**

Note: Some of the unit costs include contingency resources; however, contingency has not been applied programmatically.

* The capital costs associated with the service improvements are solely for the start-up costs. In addition, an increase in operating dollars would be needed to deliver the service improvements.

In addition to capital costs, this document considers the operating cost implications. The TEP service improvements represent a net increase in service hours. This would be partially covered by the operational efficiencies gained by the TTRP, but would also require additional operating resources to be budgeted for FY 14 and FY 16. Many of the capital projects would have O&M implications. For example, the overhead wire expansion would require additional maintenance. Alternatively, TTRP would reduce running time and would result in decreased operating costs collectively.

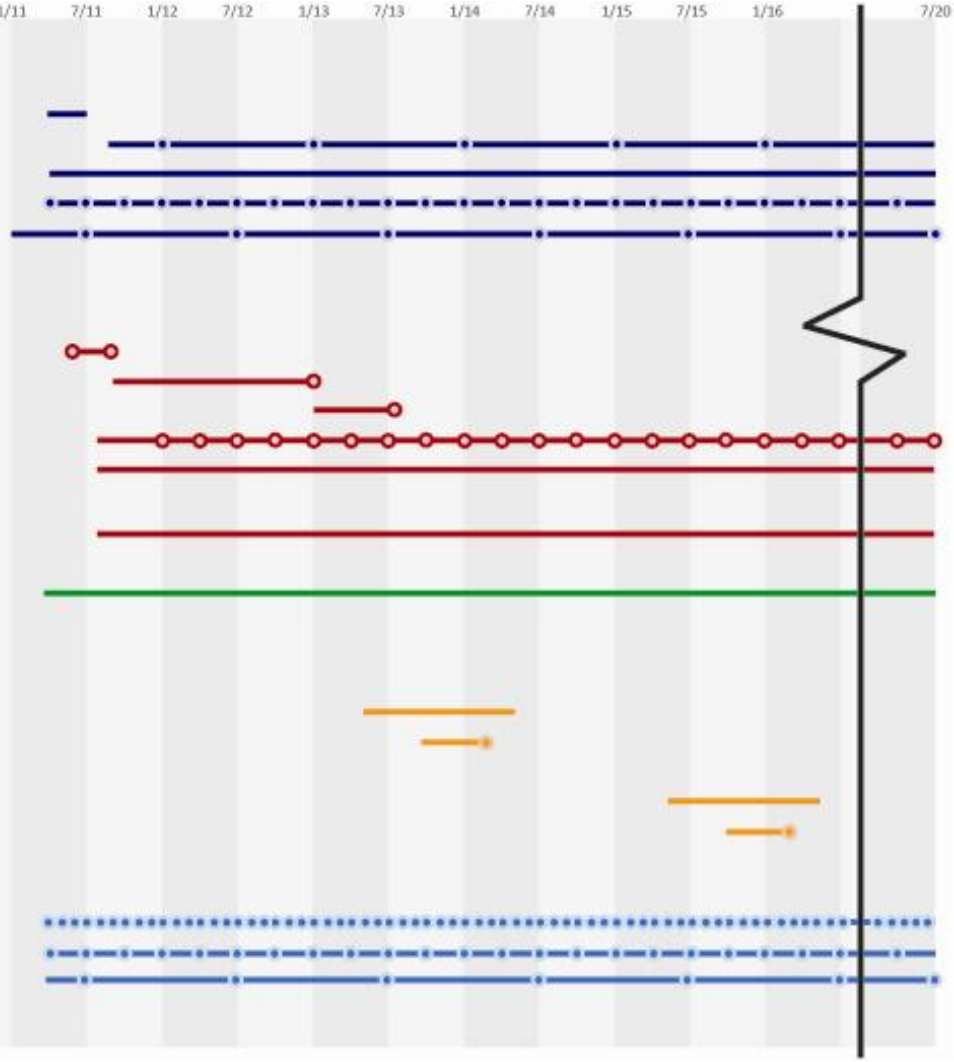
The TEP proposals (requiring both capital and operating funding) would be funded through a variety of federal, state and local sources. Approximately 10 percent of the capital costs of the proposed capital projects are funded. It should be noted that this strategy was developed by assuming a modest amount of additional funds would be available on an annual basis; however, it is likely that more or less funding could be available throughout this timeframe. Considering the current economic conditions, the SFMTA will need to revisit the timing and approach for delivering the TEP initiatives to maximize the return on investment.

1.3 Implementation Requirements

This document includes a comprehensive work proposal for TEP implementation with measurable objectives, timelines, and roles and responsibilities. It will serve as the guiding document to enable the TEP Program Manager and the Implementation Task Force to plan and oversee the timely implementation, pending the completion of environmental review of major TEP initiatives. Figure 1-2 provides a high-level version of the implementation schedule, including the major milestones and activities that would need to occur.

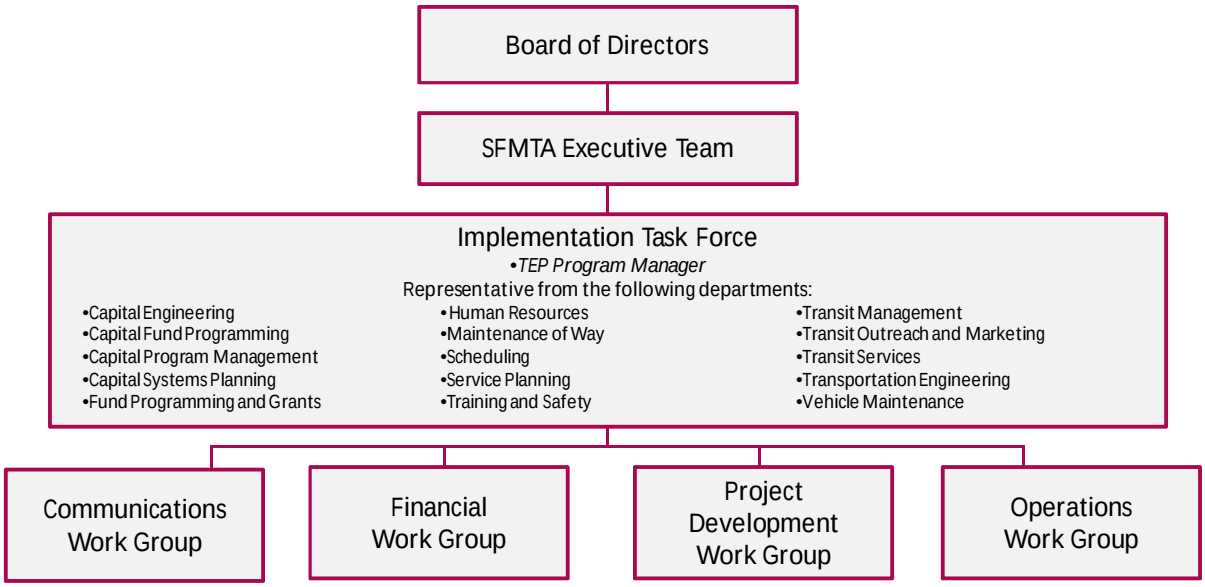
FIGURE 1-2: HIGH-LEVEL IMPLEMENTATION SCHEDULE

	Start Date (mm/yy)	End Date (mm/yy)
Internal Coordination & Approvals		
Develop TEP Working Groups	3/11	6/11
Develop and update TEP financial plan	7/11	6/20
Regular TEP Internal Coordination meetings	3/11	6/20
Quarterly TEP Board Updates	3/11	6/20
Participate in capital planning process	1/11	6/20
External Communication, Coordination, and Approvals		
CEQA		
1. Consultant Selection	6/11	9/11
2. Draft EIR published	9/11	1/13
3. Final EIR published	1/13	8/13
Develop and update external stakeholder plan	7/11	9/11
Communicate with external stakeholders	7/11	9/20
Approve TEP and legislate near-term changes (following CEQA certification)	9/13	12/13
Obtain necessary external reviews, coordination, and approvals	7/11	6/20
Capital Project Development	3/11	6/20
Service Changes		
Phase 1		
Community outreach	5/13	5/14
Service change system requirements	10/13	3/14
Phase 2		
Community outreach	5/15	5/16
Service change system requirements	10/15	3/16
On-Going TEP Activities		
Risk and issue assessment (monthly)	3/11	6/20
Performance management (quarterly)	3/11	6/20
Implementation Plan update (annually)	3/11	6/20
Milestone/Meetings		



As implementation of the TEP proposals progresses forward, it will be critical for the SFMTA to have a strong administrative and organizational infrastructure to support the strategies. As shown in **Error! Not a valid bookmark self-reference.**, the SFMTAB will be responsible for the overall success of the TEP, with appropriate support from the Executive Team, Implementation Task Force, work groups, and other City departments.

FIGURE 1-3: TEP PROPOSED ORGANIZATION CHART



To prepare the SFMTA, this strategy outlines internal and external communication and approval tasks as well as roles and responsibilities, staffing requirements, capital project development, service change activities, risk management and performance management guidelines. In the first few years of implementation, this proposal estimates that approximately 18 additional staff positions would be needed to meet its initial planning, design and implementation requirements. These positions could be filled by new requisitions, redirecting of staff, or consultant support.

Critical to the TEP implementation process is satisfaction of the requirements for environmental review under the California Environmental Quality Act (CEQA). This strategy assumes the environmental review will occur in 24 months; however, this timeline will require executive support, dedicated resources, and political resolve. All dates detailed in this strategy are subject to change and will likely be modified once the environmental review begins. It is anticipated that certain proposals that were initially associated with the TEP, but may have independent utility and/or may not be subject to CEQA, may be implemented independently prior to the completion of the TEP environmental review process. These proposals may be environmentally

assessed separately by the San Francisco Planning Department. For purposes of environmental review, such proposals then would not be further considered as components of the TEP. Additionally, TEP proposals may be subject to the National Environmental Policy Act (NEPA) review if federal funds are used for engineering or construction projects.

There are some activities that need to take place throughout TEP implementation, including performance management, risk and issue management, and regular TEP Implementation Strategy updates. Successful performance management will ensure that TEP initiatives are positively affecting the metrics, and effective risk management will seek to identify, minimize and address problems and conflicts as they arise. All of these activities will ensure that the TEP implementation is monitored and communicated effectively.

1.4 Organizational Readiness

This strategy also assesses the Agency's organizational readiness for TEP implementation. Comparison of industry best practices to the SFMTA's current practices identified SFMTA's strengths and areas of improvement regarding TEP implementation. As shown in this strategy document, the TEP has established goals and initiatives; however, some of the initiatives are more fully scoped than others. For example, the service improvements are fully scoped while the TTRP corridor segments are only conceptual plans. Additionally, the SFMTA has not developed a detailed budget and financial strategy to fully support the implementation. This assessment identifies opportunities for improvement in the areas of program definition, program support, and program processes and controls.

The TEP Implementation Strategy is a joint effort between the SFMTA and the San Francisco Office of the Controller with assistance from Parsons Brinckerhoff (PB) and represents the best information available at the time of publication. It should be considered a dynamic document and, as such, is intended to be updated periodically by the TEP Program Manager under the direction of the Implementation Task Force.

2. INTRODUCTION

For the first time since the late 1970s, the City and County of San Francisco is comprehensively assessing and revamping its unique transit system, which consists of historic streetcars, light rail vehicles, bio-diesel and bio-diesel hybrid electric buses, electric trolley coaches, and cable cars. Extensive data analysis, best practice research and public outreach shaped proposals for meaningful improvements on key routes and identified needed investments to ensure cost-effective customer service and performance for both now and the future.

The purpose of this document is to provide TEP implementation guidance to support decision-making processes for Agency staff and the SFMTAB by answering the following questions:

- What is the TEP and what is it trying to accomplish?
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This TEP Implementation Strategy is the first in addressing the immediate transit needs of the City and County of San Francisco. The initiatives associated with this strategy provide the SFMTA with the foundation for the Agency's multi-modal vision and capital investments. Future strategies would address the long-term system optimization to meet the City's sustainable growth and climate goals. Through implementation of the TEP initiatives, the SFMTA is beginning a commitment to provide better quality transit service to existing customers today and identify future needs in the coming years.

This document is intended to be read by Agency staff and the SFMTA Board of Directors (SFMTAB) for the following purposes:

- Agency staff may use this document to identify and allocate resources, coordinate and prioritize TEP proposals externally with other agencies and internally with other Agency efforts, and inform anticipated service planning needs in the future.
- The SFMTAB may use this strategy document as a decision-making factor in its funding allocations.

2.1 Background

The San Francisco Municipal Railway (Muni) is one of America's oldest public transit systems, the largest in the Bay Area, and the seventh largest system in the United States. The SFMTA operates a diverse fleet in a dense and challenging urban environment. Using historic streetcars, light rail vehicles, bio-diesel and bio-diesel hybrid buses, trolley coaches and cable cars, SFMTA transports more than 215 million customers a year.

Like other transit providers, the SFMTA faces many challenges, including aging infrastructure, increasing operational costs, changing travel patterns, and operational and physical constraints that affect the Agency's ability to meet on-time performance standards established in the City Charter. In recent years, there has been a significant shift in residential and employment patterns, creating a need to revisit transit routing and the frequency and span of service to optimize service across the network.

In an effort to improve service efficiency and effectiveness, respond to changing travel patterns, and meet standards set in the City Charter, the SFMTA and the San Francisco Office of the Controller launched a comprehensive detailed analysis of existing travel patterns and a review of service options. The TEP represents the first major review of service provision since the late 1970s. The study was designed to strengthen the SFMTA's ability to respond to current travel needs, provide a blueprint for future service improvements, apply best practices to optimize service delivery and promote the system's long-term financial stability and operational viability. Informed by data analysis, best practice research, and stakeholder outreach, the TEP developed a set of preliminary proposals designed to address the aforementioned goals with a focus on improving the existing network of bus and rail services that San Francisco commuters depend on every day. This analysis resulted in a proposed service policy framework that organizes Muni services into four transit categories:

- **Rapid Network:** These frequent, heavily used bus routes and rail lines make up the backbone of the Muni system and would be high priorities for service and customer amenity enhancements. The rapid network would be supported by travel time reduction proposals (TTRP), systemwide capital improvements, and service improvements.
- **Local Network:** These essential routes complement and connect to the Rapid Network, allowing customers to get to most destinations in San Francisco with no more than one transfer.
- **Community Connectors:** This category includes lightly used bus routes that circulate through San Francisco's hillside residential neighborhoods and fill in gaps in coverage to connect customers to key transit hubs.

- **Specialized Services:** These routes are tailored to serve a particular market at limited times of day, and include express routes, commuter connections to BART and Caltrain stations, and ballgame routes or lines.

After a thorough vetting process with project and community stakeholders, the SFMTAB endorsed the TEP recommendations for purposes of environmental evaluation.

2.2 Goals and Expected Outcomes

During the TEP planning phase, the SFMTA gathered an unprecedented level of ridership data, studied best practices from other transit systems and conducted extensive public outreach to community stakeholders, policymakers and the SFMTA employees. This analysis, combined with the SFMTA's Strategic Plan, identified the following goals:

- **Improve service reliability**: Stakeholders identified Muni service reliability as the most important need during the TEP planning process. Service reliability is achieved when a person's end-to-end trip time is predictable and takes a similar amount of time each day. For a trip to be reliable, the bus or train must arrive according to the posted schedules, or, for frequent services, when the service vehicle arrives at regular, predictable intervals. Improving service reliability is a core operational service objective for the SFMTA. This measure ensures that the transit service is a quality choice for residents and workers when weighed against other modes, especially a single-occupant car trip.
- **Reduce travel time:** To make Muni a competitive mode choice, reducing travel time is a priority for customers and transit managers alike. The travel-time metric measures the efficiency of a trip from terminal to terminal and the ability for the SFMTA to minimize delays encountered en route, such as those associated with customer boarding and alighting, the time required to pull into and out of bus zones, the friction of traffic congestion, and the delays associated with traffic signals.
- **Improve customer experience:** Accommodating and informing customers traveling, transferring and waiting in a safe and comfortable manner keeps existing customers and attracts new customers.
- **Improve service effectiveness and efficiency:** The TEP aims to make Muni efficient from both a customer and operational perspective. Ensuring that the system is using resources where they are most needed to minimize crowding and optimize the distribution of both fleet and operators, while controlling system costs, is critical to the success of transit as a competitive mode.

In keeping with these goals, the following outcomes are anticipated:

- Improve conditions for current customers
- Increase transit ridership by attracting new customers
- Develop positive relationships with communities, customers, and employees
- Deliver cost-effective service to optimize existing resources

Measuring the success of the TEP implementation will help the SFMTA to grow as a system, and the goals represent Muni's commitment to customers, employees and the citizens of San Francisco. (See *Performance Management* section in Chapter 5 for performance metrics associated with each of the goals described above.)

Since the planning phase concluded, the SFMTA has incorporated TEP principles into all aspects of transit planning and has already realized several accomplishments associated with these goals, including:

- State of good repair program was prioritized to focus on service reliability (e.g., Saint Francis Circle Rail Replacement project).
- Rehabilitation program was developed for critical vehicle components.
- The TEP informed the December 2009 service changes, May 2010 service cuts, and September 2010 service restoration by providing data that showed how to minimize customer impacts under budget constraints. Resources were allocated to the most crowded routes and some route restructuring was implemented.
- The SFMTA scheduling department improved reliability by adjusting the running time of 60 percent of weekday schedules. Standby pay was reduced to improve cost-effectiveness of service delivery.
- Line management center was created to centrally control transit operations by using technology (e.g., NextMuni and cameras) to proactively manage terminal departures, service gaps, breakdowns, etc.
- Absenteeism policy was developed to maximize operator availability.
- TEP capital proposals were included and ranked in the SFMTA Capital Plan.
- The TEP supported the Service Planning Team's completion of a comprehensive transit-stop inventory, a database of amenities, and locations of all Muni system stops.
- Automatic Passenger Counters (APCs) were increased to 30 percent of bus fleet, and deployment plan was implemented to rotate APCs systematically. These are used for the purpose of ongoing ridership data collection and analysis.
- Complementary projects, such as the SF*park* program and Van Ness Bus Rapid Transit (BRT), were pursued to reduce the impact of traffic congestion on transit.

2.3 Implementation Strategy

The balance of this document provides a strategy to successfully implement the TEP initiatives. It is intended for multiple audiences and would need to be updated frequently to reflect regional, financial and organizational changes. The methodology used to develop the TEP Implementation Strategy can be found in Appendix I.

The following chapters are included and introduced in turn:

- **TEP Initiatives Overview** (Chapter 3) – This chapter describes TEP proposals and is organized by project categories and the timeframe in which they are proposed to be completed.
- **Cost and Funding Summary** (Chapter 4) – This chapter describes the capital costs and begins a discussion of O&M implications. It also includes an explanation of the cost-estimating approach, the prioritization strategy, and a summary of available funding.
- **Implementation Requirements** (Chapter 5) – This chapter describes the internal and external requirements associated with implementing the TEP and the ongoing activities (e.g., risk management). It includes a proposed organization chart with roles and responsibilities, communications, and approvals, and an approach to performance and risk management.
- **Organizational Readiness** (Chapter 6) – This chapter includes an assessment of the SFMTA's ability to deliver the TEP Implementation Strategy. It includes best practices review and recommendations to strengthen program delivery.
- **Appendices** – The appendices include the following:
  - TEP Implementation Strategy Development Methodology
  - Capital Projects' Detailed Overviews
  - TTRP Overview
  - Service Improvements Route Maps
  - TEP Capital Cost Summary (2010 Dollars)
  - Inflation Assumptions